



STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
610 UNIVERSITY AVENUE
FAIRBANKS, AK 99709-3643

WASTE MANAGEMENT PERMIT

for

Teck Alaska, Incorporated

Permit No. 2021DB0001

Date: September 23, 2021

This Waste Management Permit is issued to Teck Alaska, Incorporated (TAK), 2525 C Street, Suite 301, Anchorage, Alaska 99503 for the disposal of wastes from the Red Dog Mine as described in the permit. The Red Dog Mine facilities are located 82 miles north of Kotzebue, Alaska at Latitude 68° 04' 17" N and, Longitude 162° 51' 05" W. This permit is issued under the provisions of Alaska Statutes (AS) 46.03, and the Alaska Administrative Code (AAC), 18 AAC 15, 18 AAC 60, 18 AAC 70, and 18 AAC 72, as amended or revised, and other applicable state laws and regulations. This permit is effective **September 23, 2021** and expires after **September 22, 2026**. This permit may be terminated or modified in accordance with AS 46.03.120.

This permit is subject to the conditions and stipulations contained in Sections 1 through 6, and it incorporates by reference *Integrated Waste Management Plan Red Dog Mine, Alaska, USA* September 2021 (*IWMP*) and its appendices, *Quality Assurance Project Plan Red Dog Mine, Alaska, USA* September 2021 (*QAPP*), and *Reclamation Plan Red Dog Mine, Alaska, USA* September 2021 (*RP*) and its appendices. Changes to the documents incorporated herein must be approved by the Alaska Department of Environmental Conservation (department or DEC) if they affect this permit. All changes approved by the department will become part of this permit.

Upon completing reclamation activities and terminating active wastewater treatment, the department requires post-closure maintenance and monitoring. Assessment of post-closure facility conditions shall determine response to and duration of the post-closure period.

Signature

Gene McCabe

Printed Name

September 23, 2021

Date

Environmental Program Manager III

Title

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1 PERMIT COVERAGE & ADOPTED REFERENCES

1.1 COVERAGE

This permit covers disposal of waste to the Tailings Storage Facility (TSF); Class III Camp Municipal Solid Waste Landfills; waste rock and ore stockpiles; Main, Aqqaluk, and Qanaiyaq mine pits; and groundwater and surface water collection, treatment, and monitoring systems within the boundary of the area designated in Figure 6.1 at the Red Dog Mine. In addition to the disposal of wastes listed above, this permit applies to hazardous chemical storage and containment, reclamation and closure activities related to all the facilities within the defined boundary, and financial responsibility to fund reclamation, closure and post-closure activities. This permit also covers monitoring requirements for the mine pits, waste rock, and ore stockpiles; characterization of acid rock drainage; and seepage collection systems. Additionally, this permit covers reclamation and closure activities of the TSF, waste rock, and mine pits, including disposal to the mine pits as approved by the department.

1.1.1 This permit covers disposal of waste and monitoring at the sites listed under this subheading. See Figure 6.2. This permit does not authorize the discharge of wastewater to surface water. Discharge to surface water from the Red Dog Mine is authorized under Alaska Pollutant Discharge Elimination System (APDES) Permit AK0038652.

1.1.1.1 Tailings Storage Facility (TSF)

The TSF is located in the upper valley of the South Fork of Red Dog Creek. The tailings are impounded by the Main Dam and Wingwall at the north end, the Back Dam at the south end, and surrounding topography.

1.1.1.2 Main Waste Dump (MWD)

The MWD is on the east side of the TSF and contains waste rock from the Main Pit and the initial development from the Aqqaluk Pit.

A portion of the seepage from the MWD is collected by series of drains and sumps situated below grade along the western toe of the MWD and the TSF. Intercepted seepage is treated by either Water Treatment Plant 1 (WTP1) or Water Treatment Plant 3 (WTP3) before its discharge to the TSF.

1.1.1.3 Class III Camp Municipal Solid Waste Landfills

Inert, general mine refuse (packaging, non-recyclable empty containers, non-putrescible refuse, etc.) are placed directly into the permitted onsite landfill trenches in a designated area of the MWD. Putrescibles are incinerated and their ashes disposed in the landfill. Unusable small vehicle tires that cannot be returned to the vendor are disposed in the landfill. Large loader and truck tires that are not returned to the vendor are authorized for burial in a designated area of the MWD.

1.1.1.4 Overburden Dump

The Overburden Dump is located on the divide between the TSF and the Bons Creek watershed. It contains a mixture of mineralized and non-mineralized waste rock. Any runoff or seepage from the Overburden Dump is captured by

the Overburden Dump collection system and pumped to the TSF.

1.1.1.5 Main Pit

Disposal of Aqqaluk Pit waste rock in the Main Pit began in 2012. The Main Pit will also receive waste rock from the Qanaiyaq Pit during its initial phase of development. The elevation of water accumulated in the Main Pit is maintained below an elevation of 850 above mean sea level. Water from the Main Pit is authorized to be pumped into the TSF.

1.1.1.6 Aqqaluk Pit

The Aqqaluk deposit is located north of the Main Pit across the Middle Fork of Red Dog Creek. The Aqqaluk Pit is designated as a treatment works and may be used for containment of wastewater, tailings and waste rock.

1.1.1.7 Oxide Dump

The Oxide Dump is east of the MWD. This dump is inactive, recontoured, equipped with a trial cover, and seeded.

1.1.1.8 Qanaiyaq Pit Dump

The Qanaiyaq deposit is located east of the MWD and south of the Oxide Dump and is thought to reside entirely above the groundwater table. Waste from the second half of the Qanaiyaq Pit will be dumped in the pit produced during the first half of Qanaiyaq development. When Qanaiyaq mining is complete, the remaining pit will be filled with Aqqaluk Pit waste.

1.1.1.9 Low Grade Ore Stockpile

The Low Grade Ore Stockpile, located north of the MWD, containing rock that meets the criteria for economic mill feed, does not meet other current economic parameters making suitable for processing. Currently, the stockpile is inactive. However, it may augmented or processed in the future, and will be reclaimed after operations cease.

1.1.1.10 Mine Water Monitoring Stations

The *IWMP* designates locations for monitoring mine-impacted water quality and quantity. Data aid in the management of mine water and maintenance of water and load balance models.

1.1.1.11 Water Quality and Biomonitoring Program

Biomonitoring in the Red Dog Creek area was initiated in 1990 with fish tissue sampling and expanded to the Bons Creek area in 2004. In 1996, invertebrate and periphyton sampling were added. Programs were updated in 2007 by the TAK in consultation with Alaska Department of Fish & Game. The programs include a combination of aquatic life and water quality monitoring with data collected at varying frequencies and reported annually.

1.1.1.12 Permafrost and Sub-permafrost Groundwater Monitoring

15 thermistors and 9 piezometers surround the TSF. These instruments provide quarterly measurements of permafrost temperature and the phreatic surface

ensuring that no vertical flow occurs between the TSF and the sub-permafrost system, which allows shallow flow from the TSF to be collected by the dam seepage collection system.

- 1.1.2 This permit also contains geochemical monitoring requirements for waste rock and tailings to characterize metal leaching and acid rock drainage potential.
- 1.1.3 This permit contains stipulations on chemical storage and containment.
- 1.1.4 The department may set or modify permit conditions based on monitoring results or changes in facility processes according to permit amendment or modification procedures.

1.2 ADOPTED REFERENCES

In addition to the stipulations in this permit, the permittee shall adhere to the applicable requirements of 18 AAC 15 Administrative Procedures, 18 AAC 60 Solid Waste Management Regulations, 18 AAC 70 Alaska Water Quality Standards (WQS), and 18 AAC 72 Wastewater Disposal. The permittee shall also adhere to department-approved plans authorized under the permit. When the terms of this permit differ from the terms of department-approved project documents adopted by reference in this section, the most recent term with written department approval is controlling. If there is doubt as to which conflicting term is newer, this permit shall control. Department-approved plans adopted by reference in this section must be updated within 90 days of permit issuance incorporating any changes necessary to be consistent with the terms of this permit, and these plans may be revised provided that written department approval is received. Department-approved plans adopted by reference into this permit include the following documents:

- 1.2.1 *Integrated Waste Management Plan Red Dog Mine, Alaska, USA* September 2021 (*IWMP*) and its appendices including
- 1.2.2 *Quality Assurance Project Plan Red Dog Mine, Alaska, USA* September 2021 (*QAPP*), and
- 1.2.3 *Reclamation Plan Red Dog Mine, Alaska, USA* September 2021 (*RP*).

2 SPECIFIC CONDITIONS

2.1 SITE WIDE WASTE DISPOSAL

The waste materials permitted under this section are limited to mine tailings; waste rock; Class III (camp) municipal solid wastes; mining and mineral processing wastes generated by extraction, beneficiation, and processing activities; and other wastes meeting the conditions in this permit. This permit also requires collection of seepage and runoff below the Main Dam, Back Dam, and Mine Water Diversion Dam, as well as disposal of sludge produced from mine water and domestic wastewater treatment.

While this permit is in effect and subject to the limitations in section 2.1, the permittee is authorized to dispose of solid and liquid wastes in permit-designated treatment works at the Red Dog Mine. Under 18 AAC 70.010(c), water quality standards promulgated at 18 AAC 70 do not apply to a treatment works authorized by the department and applicable water quality criteria “must be met in adjacent surface water and groundwater at and beyond the boundary of the treatment works.” Treatment works are defined in AS 46.03.900(33) as “a plant, disposal field, lagoon, pumping station, constructed drainage ditch or surface water intercepting ditch, incinerator, area devoted to sanitary landfills, or other works installed for

the purpose of treating neutralizing, stabilizing, or disposing of sewage, industrial waste, or other wastes.”

2.1.1 All Treatment Works – The Main, Aqqaluk, and Qanaiyaq mine pits along with the TSF, waste rock dumps, mine water seepage and collection systems, and Class III municipal solid waste landfills are approved for disposal of solid or liquid wastes and approved as treatment works per 18 AAC 70.990(33) and not subject to WQS in 18 AAC 70.010(c).

2.1.2 Limitations

- 2.1.2.1 Except as otherwise authorized in an APDES permit, the permittee shall control and treat onsite surface water, groundwater and seepage as necessary to prevent offsite water quality exceedances. As stated in Section 1.1.1, this permit does not authorize point source discharges to surface water.
- 2.1.2.2 The permittee shall ensure that all wastes are deposited in a manner that will not damage or otherwise jeopardize the integrity of containment.
- 2.1.2.3 The permittee shall implement a program to minimize the likelihood that any area containing contaminated water within the facility boundary becomes attractive to waterfowl, shorebirds, or other wildlife.
- 2.1.2.4 Without prior approval, activities at the site that will generate treatment and disposal of greater amounts of waste other than considered in this section of the permit are prohibited. This condition excludes mining and milling rates which are not considered in this section
- 2.1.2.5 The following materials shall not be disposed onsite unless approved by the department on a case-by-case basis and written approval is provided. Prohibitions under Section 2.1.2.5 exclude chemicals used in the beneficiation process, which may be disposed in the TSF.
 - 2.1.2.5.1 Acute hazardous wastes, as defined by 18 AAC 60.990(157), including radioactive material, explosives, strong acids and untreated pathogenic waste; however, this prohibition does not preclude disposal of natural minerals found in mine rock or residual wastes included as byproducts of the beneficiation; or
 - 2.1.2.5.2 Contaminated soils, spill booms, liners used for the containment of spilled hazardous substances, chemicals used in the cleanup of hazardous substance spills, or other hazardous substance spill cleanup wastes.
- 2.1.2.6 Wash water from the maintenance shops and truck wash may be discharged into the TSF. Oily water must go through an oil/water separator and the treated water may not have a sheen prior to entering the TSF. Dry methods of cleanup shall be used for initial cleanup of oil spills in the maintenance shops.
- 2.1.2.7 If monitoring as specified in Section 2.5 is required, the water in the groundwater monitoring wells must not show a statistically significant increase, according to 18 AAC 60.830(h), in concentration above the background quality. When a statistically significant increase above the background quality is discovered, corrective action outlined in Section 2.7

must be implemented.

2.1.2.8 The limitations in Sections 2.1.2 and 2.2 do not preclude, and authorization is hereby given for, disposal of non-hazardous incidental wastes such as: (i) settled solids from sumps, ditches, and degritting basins; (ii) incinerator ash and residue; (iii) ash from combustion of scrap wood material; (iv) iron (drill steel, balls, empty cans, etc.); (v) empty plastic and glass containers; (vi) inert domestic waste; (vii) construction debris; (viii) tires; (ix) spill cleanup debris approved by the department including mill remediated residual ore and soil; (x) non-terne plated used oil filters that have been gravity hot-drained; and (xi) such other material as would otherwise be disposed of in a Class III (camp) municipal solid waste landfill without special handling.

2.1.2.9 Wastewater may be disposed to the mine pits at closure provided that the following requirements are satisfied, and the department determines that there will be insignificant impact on long term water quality.

2.1.2.9.1 Samples from each water source proposed to be discharged to a pit shall be collected at the frequency prescribed in the *IWMP Appendix D* and shall be analyzed for Analytical Profile II constituents listed in the *IWMP Appendix D*.

2.1.2.9.2 As part of annual reporting required in Section 2.6.3, the permittee shall submit the sample results from Section 2.1.2.9.1 above to the department for review and to gain department approval for the next year's discharge to each pit.

2.1.2.10 The department may set or modify permit conditions based on monitoring results or changes in facility processes in accordance with permit amendment or modification procedures.

Seepage and runoff collected from the Main, Back, and Mine Water Diversion dams, and waste rock piles may be disposed of into a treatment works.

2.2 CLASS III CAMP MUNICIPAL SOLID WASTE LANDFILLS (MSWLFS)

2.2.1 The permittee shall comply with the *IWMP*, as well as the following permit conditions, for disposal of incinerated municipal solid waste and inert waste in trenches or cells in the MWD. Additional modifications may be requested, but must be authorized by the department before that modification is effective.

2.2.2 Ensure that all operations will accommodate the waste volume and are done in a manner that will facilitate closure when the landfill is closed.

2.2.3 The permittee shall erect and maintain signs that include the following legibly printed information:

Facility Identification,
Owner/Operator Name,
Conditions for Use, and
Emergency Phone Numbers

2.2.4 Signs must be readily visible in the facility directing users to the various disposal areas and pertinent rules; and

2.2.5 List items not to be disposed of at the site such as acids, corrosives, solvents, oily

- wastes, asbestos waste, explosives, radioactive wastes, pathogenic wastes (which have not been sterilized or incinerated), and hazardous wastes.
- 2.2.6 Ensure that surface water runoff from outside the facility does not flow onto the facility, and over, into or through uncovered or covered solid wastes by constructing and maintaining diversion structures such as ditches or berms as needed.
- 2.2.7 Ensure that the site is managed in such a way as to prevent attracting wildlife to the facility. To reduce wildlife attraction wastes will be stored in suitable containers prior to incineration, open burning, or placement in the disposal cell, trench.
- 2.2.8 Construct solid waste disposal areas and maintain them in a manner that allows for construction of a fence, if necessary, to control wildlife access. When in the judgment of the department, attraction of wildlife to a site becomes significant, a fence will be constructed around the solid waste disposal area. The fence must meet specifications to effectively exclude carnivores as determined by the department.
- 2.2.9 Ensure that the bottom of the waste disposal trench or cell is a minimum of ten feet above the high groundwater level or at least two feet above the natural ground surface.
- 2.2.10 The permittee shall comply with the following conditions at Class III (camp) MSWLFs:
- 2.2.10.1 Prohibit disposal of hazardous and other wastes as listed in Section 2.1.2.5 unless written permission is obtained from the department,
- 2.2.10.2 Except as approved in Section 2.8.1 of the *IWMP*, disposal of uncombusted household waste is prohibited,
- 2.2.10.3 Ensure that only ash or incinerator residual waste and inert waste as needed are disposed at these sites. Putrescible wastes may not be disposed of at these sites.
- 2.2.10.4 Prohibit the disposal of non-incinerated sewage sludge under Section 2.2.12 unless it is deposited into a separate trench, cell, containing only sewage sludge and handled in accordance with 18 AAC 60.365. Under 18 AAC 60.365(c), non-incinerated sewage sludge may not be placed in the trench or cell if it contains “free liquids.” Non-incinerated sewage sludge placed in a trench or cell must be buried at the end of the day to meet the vector reduction requirement of 40 C.F.R. 503.33 (b)(11) and adopted by reference in 18 AAC 60.505.
- 2.2.10.5 Prohibit disposal of acute hazardous waste containers unless empty and triple-rinsed as required by 18 AAC 60.990(157).
- 2.2.10.6 Prohibit discharge of firearms at the facility other than for use in wildlife hazing activities,
- 2.2.10.7 Prohibit disposal of lead-acid vehicle batteries at the landfill site. Temporary storage in leak-proof, covered containers prior to transport to an acceptable recycle or disposal site is permitted.
- 2.2.10.8 Prohibit regular disposal of economically salvageable or recyclable materials, including, but not limited to: prefabricated buildings, vehicles, drums,

- tankage, major equipment components, and major scrap components.
- 2.2.10.9 Prohibit the disposal of regulated asbestos containing materials at this site.
 - 2.2.10.10 Consolidate and compact all loose refuse and cover with a minimum of six inches of compacted cover material as needed to prevent blowing litter.
 - 2.2.10.11 Ensure the wastes placed in the disposal cell or trench are compacted in four-foot increments.
 - 2.2.10.12 Apply at least 12 inches of intermediate cover material to any portion of the landfill that will be inactive for a period of 90 days or more. The intermediate cover must be applied within seven days after the waste is last deposited in the inactive area, and graded to prevent water from ponding.
 - 2.2.10.13 Maintain a minimum separation of 50 feet between the designated portion of the landfill and any surface water drainage feature (e.g., swales, seasonal ponds) or the facility boundary.
 - 2.2.10.14 Ensure that the maximum landfill working face width shall not exceed 200 feet. The maximum height of the working face shall not exceed 10 feet.
 - 2.2.10.15 Ensure the working face is kept as small as practical to reduce the potential for windblown litter.
 - 2.2.10.16 Ensure that solid wastes are not placed in surface waters.
 - 2.2.10.17 Ensure waste, leachate, or eroded soil from the facility does not cause an exceedance of the water quality standards set out in 18 AAC 70.
 - 2.2.10.18 Oil filters must be hot drained and crushed or incinerated prior to disposal.
 - 2.2.10.19 Ensure that non-salvageable drums have been emptied of fluids prior to crushing and burying. All fluids removed from the drums prior to their placement in the landfill shall be properly disposed according to the permit.
 - 2.2.10.20 Maintain positive control of all persons who are within the landfill boundaries and that refuse will be deposited in approved locations. Dumping in unauthorized areas violates conditions of this permit.
 - 2.2.10.21 Collect all windblown and littered refuse from within the disposal site and along the entrance road and return it to the active disposal trench, cell, for burial. All littered wastes on lands within 500 feet of the site, whether windblown or dumped, shall be collected and disposed of at a frequency necessary to prevent this litter from becoming an aesthetic nuisance.
 - 2.2.10.22 Close the solid waste landfill trenches or cells within 60 days after waste is last deposited in that area, using a soil material at least two feet thick and graded to prevent water from ponding.
 - 2.2.10.23 Control and treat surface water, groundwater and seepage as necessary to prevent off-site water quality exceedances,
 - 2.2.10.24 Shall not place solid waste in water in the solid waste landfill facilities, and shall not allow solid waste to wash or blow away from the facility.
- 2.2.11 The permittee shall limit burning at the Class III (camp) MSWLFs and:
- 2.2.11.1 Prohibit open burning on the working face and immediately extinguish all fires that occur on the working face. Notify the department's Division of Environmental Health, Fairbanks, at (907) 451-2108, if any fires occur on the

working face.

2.2.11.2 Prohibit items that generate black smoke from being burned, such as tires and plastics.

2.2.11.3 Ensure that open burning of wood, paper and paper products are kept at least 100 feet from the working face. Burning in the landfill area shall be done in a burn box or burn cage, and open burning requires that best combustion efficiency be achieved with no smoldering of wastes.

2.2.11.4 Ensure an attendant is on duty during open burning operations at the landfill.

2.2.11.5 Place no more than one ton of ash in the landfill per day.

2.2.12 Incineration

2.2.12.1 When there is a change in the incinerator waste stream or at least annually, the permittee shall collect a composite sample of ash, and analyze it for metals using the Toxicity Characteristic Leaching Procedure. A change of waste stream includes any modification to the sewage treatment system affecting the composition of sewage solids. A composite sample consists of ash collected over a three week period including ash from the incineration of typical quantities of sewage sludge.

2.2.12.2 During the last year of this permit, the permittee shall analyze a composite sample of incinerator ash, as defined above, for polychlorinated biphenyls.

2.2.12.3 When incinerating sewage solids (sludge), it must be mixed with municipal solid waste, and the portion of municipal solid waste must constitute more than 30 percent of the total weight when sewage solids are included.

2.2.12.4 The permittee shall ensure that the location and volume of waste placed in the landfill is surveyed annually and recorded.

2.2.12.5 When a trench or cell reaches capacity, the following information shall be recorded on the annual survey:

2.2.12.5.1 Total volume of waste placed in the trench, cell,

2.2.12.5.2 Geographical boundary of the trench, cell,

2.2.12.5.3 Elevation of final waste placement, cell, and

2.2.12.5.4 Depth of waste placed in the trench, cell.

2.3 SITE CONSTRUCTION, MAINTENANCE, & OPERATION

2.3.1 General

2.3.1.1 Changes that may have a significant impact on mine closure, reclamation, or water quality; information on engineering changes to the mill that may affect water quality or waste characteristics; new waste treatment processes; changes to solid waste disposal facilities; changes to ground and surface water interception, conveyance or monitoring systems; or the addition of new waste streams discharging to TSF, pits, or dumps that could significantly change the quality or increase the quantity of pollutants in a waste stream must be submitted to the department and approval must be obtained prior to any such changes or discharges.

2.3.1.2 The permittee shall develop the site in accordance with department-approved

plans and amendments thereof, which are submitted by the applicant as required by this permit and referenced in Section 1.2. Pollution prevention concepts shall be incorporated into operations plans for the project.

- 2.3.1.3 The permittee shall construct and maintain seepage collection systems below the Main Dam, Back Dam, and Mine Water Diversion Dam in accordance with plans approved by the department. These seepage collection systems shall be constructed and maintained such that all seepage and runoff water from these areas will be captured and pumped back to the tailings area or to one of the mine pits as approved in the *RP*. The seepage and runoff collection systems shall be operated to ensure that the Red Dog Mine operates as a zero discharge facility except for the discharges permitted under the most recent version of APDES Permit Number AK0038652.
 - 2.3.1.4 The Main Dam, Back Dam, Mine Water Diversion Dam, and their appurtenances must be operated as approved by the department in consultation with Alaska Department of Natural Resources (ADNR), Division of Mining, Land and Water (DMLW), Dam Safety and Construction Unit.
 - 2.3.1.5 Freeboard at the TSF shall be maintained to minimize overtopping as indicated in the Red Dog Project's Operation, Maintenance and Emergency Action Manual as approved by the department in consultation with ADNR, DMLW, Dam Safety and Construction Unit.
 - 2.3.1.6 The permittee shall ensure that wastes are deposited into the TSF, pits, and waste rock disposal areas in a manner that will not damage or otherwise jeopardize the integrity of the containment of the those areas.
 - 2.3.1.7 The permittee shall not dispose of waste materials in quantities exceeding the design capacity of the disposal facilities.
 - 2.3.1.8 The permittee shall control and treat surface water, groundwater, and seepage from the mining and milling areas as necessary to prevent downgradient, off-site, water quality exceedances in waters of the State.
 - 2.3.1.9 The permittee shall take reasonable measures to control dust and particulates that arise from the TSF, dumps, pits, and handling and transport facilities.
- 2.3.2 Secondary Containment
- 2.3.2.1 Secondary containment of all hazardous substances, as defined at AS 46.03.826(5), must be impermeable to those stored hazardous substances.
 - 2.3.2.2 The permittee shall provide and maintain secondary containment for all chemical mix tanks containing hazardous or toxic materials and new piping associated with that tankage. For a given containment area, secondary containment must provide a storage volume greater than or equal to 110 percent of the largest tank or the total volume of manifolded tanks. The permittee must design and install secondary containment structures in a manner that ensures that solid waste and leachate will not escape from the structures. To prevent such discharges, facilities shall be maintained in good working condition at all times by the permittee.

2.3.3 Notification

- 2.3.3.1 The permittee shall notify the department in writing at least 15 days before the introduction of a new chemical into the process or waste treatment streams that could significantly change the quality or increase the quantity of pollutants in a waste stream(s). Safety Data Sheets on new chemicals must be forwarded to the department at time of notification and maintained onsite. Introduction of the new chemical into the process requires written department approval.
- 2.3.3.2 Under 18 AAC 72.600, the permittee shall submit engineering plans to the department at least 60 days before construction or modification of an applicable system, and receive department approval of any changes that will significantly modify the quality or quantity of waste stream, the operation of a waste treatment component, or the disposal facilities covered under this permit.
- 2.3.3.3 With respect to any department approved change as described in Section 2.3.3.2, the permittee must submit to the department within 90 days after completing construction:
 - 2.3.3.3.1 As-built drawings of the process components showing changes potentially affecting performance as required in 18 AAC 72.600,
 - 2.3.3.3.2 A summary of the quality control activities that were carried out during construction, and
 - 2.3.3.3.3 The revised operating plans that reflect modifications made during construction.

2.3.4 Fuel and Hazardous Substances

- 2.3.4.1 The permittee shall design and install all process piping and chemical mix tanks to allow for routine inspections for leaks. Mill reagent piping outside of the mill building must not be buried unless secondary containment is used that provides the ability to inspect for leaks.
- 2.3.4.2 The permittee shall maintain fuel handling and storage facilities in a manner that will minimize the discharge of hazardous substances.

2.4 MODIFIED LIMITS

Site Specific Method Detection Limit (MDL) and Minimum Level of Quantification (ML) for Weak Acid Dissociable (WAD) Cyanide Concentrations

- 2.4.1 During the life of this permit, a new or revised site specific MDL for WAD cyanide unique to a site specific water chemistry may be established in accordance with 18 AAC 70.020(c)(7) and EPA guidance document no. EPA-821-B-04-005 for a pollutant present in this discharge. Upon the effective date of the department-approved MDL, this permit is automatically modified to require reporting of measurements at or above the MDL.
- 2.4.2 During the life of this permit, a new or revised site specific ML for WAD cyanide unique to a site specific water chemistry may be established in accordance with 18 AAC 70.020(c)(7) and EPA guidance document no. EPA-821-B-04-005 for a pollutant present in this discharge. Upon the effective date of the department-approved ML, this permit is considered to be automatically modified for

compliance purposes in accordance with the detection level specified in the ML. Exceedance of a ML shall be reported according to Section 2.6.1.

- 2.4.3 Values between the MDL and ML provide a margin of safety indicating increasing trends prior to any exceedances. Based on the rate and magnitude of a trend, the department may require corrective action according to Section 2.7.2 to prevent environmental harm. When lab results are between the MDL and ML, the permittee shall verbally notify the department within 60 days of the end of the calendar quarter when it occurred and provide written notification within 7 days of verbal notice.

2.5 MONITORING

The *IWMP* dated September 2021, submitted by TAK and approved by the department, is incorporated into this permit. Future department-approved changes to project monitoring will be included as modifications to the *IWMP* and do not require re-issuance or modification of this permit. The *IWMP* shall contain monitoring procedures to include the following and must be updated within 90 days of permit issuance, as needed, to conform to the permit.

- 2.5.1 Required monitoring locations (see Figure 6.3) listed below and associated frequencies described in Table 1 of the *IWMP* are included by reference in this permit:

- Bioassessment Program,
- Permafrost and Sub-permafrost Groundwater Monitoring,
- Mine Water management,
- Waste Rock Management,
- Tailings Management,
- Class III (camp) MSWLFs,
- Mining and Milling Activities,
- Reclamation,
- Fugitive Dust,
- Wildlife,
- Pit lakes and spillways (when sampling is possible), and
- Water leaving the mine (when sampling is possible).

- 2.5.2 Visually monitor containment and disposal facilities covered in Section 1.1.1 for signs of damage or potential damage from settlement, ponding, leakage, instability, frost action, erosion, thawing of the waste, or operations at the site. Visual monitoring shall be at least weekly and documented monthly.
- 2.5.3 Monitor surface and groundwater near the site to ensure that WQS are not exceeded and that sample results are statistically valid.
- 2.5.4 Water chemistry analytical methods employed must be sensitive enough to determine compliance with applicable WQS. The ML for a given parameter's measurement must meet the specifications provided in Table 1 of the *QAPP*.
- 2.5.5 Water quality and flow monitoring that accounts for process water discharged to the TSF, process water recycled to the mill, water entering the pits, and any water directed to the TSF, pits, or another water treatment works, and data necessary to maintain facility water and load balances.

- 2.5.6 The permittee shall track the following water treatment quantities: water treated at Water Treatment Plant 2 (WTP2); discharge to Red Dog Creek; flocculent, lime, sodium sulfite, and other chemicals used in bulk at WTP1, WTP2, and WTP3.
- 2.5.7 The permittee shall conduct monitoring at Class III (camp) MSWLFs:
- 2.5.7.1 Visually monitor the site each month for signs of damage or potential damage from settlement, ponding, leakage, erosion, or operations at the site to ensure the active landfills are being operated according to the most recent department-approved landfill standard operating procedures. Record the inspection results and maintain them in the facility's operating record for review by department staff during inspection.
- 2.5.7.2 Maintain a set of site development and use plans and submit an updated copy to the department with the annual report.
- 2.5.7.3 Photograph the disposal site:
- 2.5.7.3.1 As prepared for waste disposal,
- 2.5.7.3.2 At least once per year during waste deposition,
- 2.5.7.3.3 After final cover has been applied, and
- 2.5.7.3.4 After revegetation during the summer following closure.
- 2.5.7.4 Photographs taken under 2.5.7.3 above should be submitted to the department within 60 days of closure and within one year of initiating revegetation.
- 2.5.8 A sample from the east or west Overburden Stockpile sump that exceeds WQS for WAD cyanide shall be reported to the department as soon as possible, but no later than the end of the next work day. Re-sampling for sample confirmation shall be performed as soon as practical
- 2.5.9 The permittee shall maintain a log of all wastes, disposed into the TSF, pits, and waste rock dumps. The log shall include the dates of disposal, estimated amount of waste, a description of the waste, and any required sampling or analysis performed on the waste. A summary shall be included in quarterly reports required in Section 2.6.2.
- 2.5.10 Groundwater and surface water monitoring and corrective action shall be in accordance with Section 2.72.7, 18 AAC 60 Solid Waste Management Regulations, and the current *IWMP* and *QAPP*.
- 2.5.11 Maintenance of inspection and sampling logs, and procedures for processing, consolidating, and reporting inspection and sampling data shall be in conformance with the current *IWMP* and *QAPP*.
- 2.5.12 The department may modify monitoring requirements, including the establishment of additional compliance points in response to trends showing changes in the concentration or load of parameters being monitored.
- 2.5.13 If the permittee monitors any influent, effluent, receiving water, or solid waste characteristic identified in the *IWMP*, more frequently than required, the permittee shall notify the department that the additional monitoring has occurred in the next quarterly report after the monitoring has occurred. The results of such monitoring shall be available for inspection by the department, and the permittee shall provide copies of the results to the department upon request.
- 2.5.14 Signs of stress to vegetation and wildlife associated with facility activities must be

monitored.

2.5.15 The *QAPP* shall ensure water compliance samples are analyzed by a laboratory that follows EPA-approved procedures, quality control requirements, reporting and documentation procedures.

2.5.16 The permittee must develop a quality *QAPP* for all sampling required by this permit. The *QAPP* must be completed within 90 days of the effective date of this permit and made available upon request 2.5.19.

2.5.17 The *QAPP* must be designed to assist in planning for the collection and analysis of water samples in support of the permit and in explaining data anomalies when they occur.

2.5.18 Throughout all sample collection and analysis activities, the permittee must use chain-of-custody procedures described in the *QAPP*.

2.5.19 The permittee must amend the *QAPP* whenever there is a modification in sample collection, sample analysis, or other procedure addressed by the *QAPP*.

2.5.20 A copy or copies of the *QAPP* must be kept onsite and made available to the department upon request.

2.6 REPORTING

2.6.1 When a statistically significant increase in the concentration of a constituent above a WQS is discovered at a groundwater or surface water monitoring location, or if noncompliance with a permit requirement is discovered, the permittee shall verbally notify the department no later than the end of the next working day after discovery, and shall conduct corrective actions according to Section 2.7.

2.6.2 The permittee shall provide the department with quarterly monitoring reports summarizing inspection and monitoring results required in Section 2.5. Reports shall satisfy the following conditions.

2.6.2.1 Due Dates - Reports for the first three calendar quarters are due within 60 days after the quarter ends, and the report for the fourth calendar quarter shall be submitted by March 1st of the following year.

2.6.2.2 Form – Reports shall be provided in electronic form using commercially available software or according to other electronic reporting requirements approved by the department. Paper copies of the reports are not required unless specifically requested.

2.6.2.3 Content - Reports shall contain a narrative portion discussing data and information collected during the preceding quarter.

2.6.2.4 Graphing - Reports shall present water quality data in graphical form indicating trends as well as the margin of compliance with limits.

2.6.2.4.1 Graphs of concentration measurement versus time must include the past five years of data, if available, and may contain all historic data.

2.6.2.4.2 The graphs must also include the parameter, units, and applicable permit limit or WQS.

2.6.2.4.3 Multiple stations, identified using symbols in a legend, may be included in the same graph.

- 2.6.2.4.4 Scales shall be proportioned to display the limit or WQS, as indicated by a highlighted line, near the top of the graph or when data exceeds the limit, the maximum value shall be near the top of the graph.
 - 2.6.2.4.5 Formatting shall allow addition of new data to each graph's cumulative data when producing the next quarterly report.
 - 2.6.2.4.6 For graphical purposes, non-detect values shall be plotted at one half the MDL, and values between the ML and MDL shall be plotted at the value of the qualified measurement.
- 2.6.3 Annual Report - In addition to satisfying the requirements of Section 2.6.2, the fourth calendar quarter report serves as the annual report. The annual report shall:
- 2.6.3.1 Be submitted to the department by March 1st of the following year;
 - 2.6.3.2 Contain an electronic copy (preferably Excel) of the water quality data for the reporting year, including the past five years' data, if available, and may contain all historic data in spreadsheet form. When a value is less than the ML, it must be identified as less than the ML, and the ML must be provided. Non-detect values must be identified as less than the MDL or non-detect and the MDL must be provided in the electronic water quality data spreadsheets; and
 - 2.6.3.3 Address the adequacy of the financial responsibility including, but not limited to, significant changes in reclamation activity costs, concurrent reclamation, expansion or other changes to the operation of the facility.
- 2.6.4 The permittee shall provide the department with copies of any amendments to the plan of operations, including the *RP*, when they affect the waste disposal operations authorized by the permit.
- 2.6.5 All records and information and reports resulting from the monitoring activities required by this permit, including but not limited to all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, shall be retained in Alaska for observation by the department for a minimum of five years. Upon request from the department, the permittee shall submit certified copies of such records.
- 2.6.6 Any onsite wildlife casualties associated with facility activities shall be reported to appropriate State agencies, including the department, within one working day of discovery.
- 2.6.7 All reports submitted under the requirements of this permit shall be sent to:
- Dept. of Environmental Conservation
 - Division of Water
 - 610 University Ave.
 - Fairbanks, AK 99709
 - (907) 451-2136
- 2.6.8 Knowingly making a false statement, by the permittee, the operator or other employees, including contractors, on any such report may result in the imposition of criminal penalties as provided under AS 46.03.790.

2.7 CORRECTIVE ACTIONS

- 2.7.1 The permittee shall comply with 18 AAC 60.815 if the visual monitoring program in Section 2.5.2 discovers damage or potential damage to the waste disposal-related facility that could lead to water quality violations.
- 2.7.2 When a statistically significant increase in a constituent concentration above the background water quality in any of the water sampling locations is discovered, the permittee shall comply with 18 AAC 60.820-860. Statistical significance shall be determined using one of the methods outlined in 18 AAC 60.830(h). The permittee shall comply with the notification requirements in 18 AAC 60.850(c) upon determining a statistically significant increase in a constituent concentration.
- 2.7.3 For a single constituent, when a statistically significant increase in concentration is discovered at a water monitoring station or if noncompliance with a permit requirement is discovered, the permittee shall:
- 2.7.3.1 Orally notify the department no later than the end of the next working day;
 - 2.7.3.2 Determine the extent of the exceedance or noncompliance;
 - 2.7.3.3 In consultation with the department and documented in writing, implement a plan to restore compliance and determine the cause of the exceedance or noncompliance;
 - 2.7.3.4 Submit to the department, within seven working days after an exceedance or noncompliance is verified by the permittee, a plan for corrective actions to prevent adverse environmental impacts and avoid future exceedances of a similar nature; and
 - 2.7.3.5 Implement the corrective action plan as approved by the department.

2.8 SUSPENSION OF OPERATIONS

- 2.8.1 Suspension of operations is defined as a suspension of mining and milling/processing activities for more than 90 days but less than three years. The length of time for the period of suspension may be extended beyond three years by written authorization from the department. The permittee shall submit a conceptual suspension of operations plan to the department within 90 days of permit issuance.
- 2.8.2 The permittee must notify the department within three days of suspending operations. The notice shall provide the nature of and reason for the suspension and its anticipated duration.
- 2.8.3 No later than ten days after operations have been suspended, the permittee shall submit a detailed and updated suspension of operations plan that supersedes the suspension of operations conceptual plan required by Section 2.8.12.8.1 with current information and specific details. The suspension plan shall address the following:
- 2.8.3.1 Explanation of what would reasonably result in resuming or permanently terminating mining or milling/processing activities;
 - 2.8.3.2 Reclamation or construction activities during the period of temporary suspension;
 - 2.8.3.3 Procedures, methods, and schedule to be implemented for the treatment,

- disposal, or storage of process water;
- 2.8.3.4 The control of surface and groundwater drainage to and from the facility and the surrounding area;
- 2.8.3.5 The control of erosion from the waste rock disposal areas, mill and camp site, and any other disturbed areas within the facility boundary;
- 2.8.3.6 The secure storage of chemicals during the period of suspended operations; and
- 2.8.3.7 Procedures for maintaining and monitoring the Main, Back, and Mine Water Diversion dams and site-wide water balance.
- 2.8.4 The department shall have 15 days to review and approve or request modifications to the suspension plan.
- 2.8.5 Once a suspension of operations plan has been approved, it becomes enforceable under the conditions of this permit and full implementation of the approved suspension plan is required. The plan can be amended by submitting a revised plan to the department for approval.
- 2.8.6 During suspension of operations, the permittee shall:
 - 2.8.6.1 Continue pollution control activities associated with waste disposal and management, including but not limited to dust control, maintenance of the drainage diversion structures, maintenance of all discharge and leakage control structures and processes, and maintenance of the Main, Back, and Mine Water Diversion dams as specified by the current *Certificate of Approval to Operate a Dam* and the suspension plan.
 - 2.8.6.2 Continue monitoring and reporting activities of all active portions of the site as specified by this permit or the suspension plan.
 - 2.8.6.3 Continue reclamation and corrective action requirements under the *RP* in light of the nature of the closure.
- 2.8.7 Written department approval is required before resuming operations after a period of temporary closure.
- 2.9 TERMINATION OF MINING & MILLING
 - 2.9.1 Termination of mining and milling/processing activities is defined as the permanent cessation of those activities. Updated reclamation and monitoring plans must be submitted for approval within 90 days after initiating termination of mining and milling/processing. The updated plans must address current conditions at the facility. Updates and changes to those plans must be approved in writing by the department.
 - 2.9.2 Termination of mining and milling at the site must be implemented and completed according to the conditions of this permit and with the *RP* approved by the department and incorporated by reference into this permit.
 - 2.9.3 Although this permit is limited to a period of five years from the date of issuance (unless administratively extended), it is the intent of the department to re-issue this permit with the following conditions to apply to waste disposal facility reclamation, post-cessation treatment and monitoring and post closure care and monitoring. These conditions may be updated, modified or amended by the department as necessary to

address new information and future changes to the facility, reclamation and closure plans, regulations or other pertinent considerations for long-term environmental protection. Closure of the waste disposal facilities will be complete when the following criteria are met:

- 2.9.3.1 Department-approved covers are installed and drainage channels are constructed and stable;
 - 2.9.3.2 A stable vegetative cover is established on the waste rock, re-contoured areas, and other infrastructure or other facilities as prescribed in *RP* approved by the department and incorporated by reference into this permit; and
 - 2.9.3.3 The department determines that active water treatment is no longer required for any water discharged from the facility.
- 2.9.4 Closure must be achieved before terminating any care and maintenance activities required by Section 2.8.6 and the approved suspension plan if a period of suspended operations immediately preceded termination of mining and milling.
 - 2.9.5 The permittee shall maintain the facility correcting any erosion or settlement of the TSF, waste rock disposal sites, and drainage channels that may impair water quality or otherwise threaten the environment, up until the time that this permit, or any successor permit, is transferred to another entity or terminated by the department.
 - 2.9.6 Disposal of demolition debris onsite may be approved during closure activities according to a plan approved by the department.
 - 2.9.7 Post-closure monitoring of ground and surface water quality and visual monitoring for settlement, seeps, and erosion is required in years 1, 2, 5, 10, 15, 20, and 30 after satisfying the criteria in Section 2.9.3. Post-closure monitoring shall be performed according the *RP* approved by the department. This schedule and the parameters monitored may be modified by the department based on the monitoring results received.
 - 2.9.8 The permittee shall assess the conditions at the facility and respond accordingly throughout the reclamation and post-closure care periods. At the end of the post-closure monitoring period (beginning when active wastewater treatment is concluded), the department will determine whether post-closure care and monitoring should be extended beyond 30 years based upon the information collected by that time.
- 2.10 FACILITY AUDIT
- Unless waived by the department, a periodic third-party environmental audit shall be completed during the final year of the permit term or sooner if final closure starts during the permit term. However, the field inspection portion of the audit shall be conducted during the snow free season the year before permit expiration. The audit will include all aspects of this Waste Management Permit. The environmental audit is required to verify TAK's compliance with applicable environmental laws associated with this permit. The third party contractor should be mutually agreed on by the State and TAK, but in the event that agreement cannot be reached, the State retains the final contractor selection decision. Costs for the third-party contractor shall be borne by TAK. The intent of the audit is to evaluate whether both TAK management and DEC permit administration provide

reasonable assurances that the facility and environmental controls are functioning as intended. The environmental audit shall include an evaluation of the adequacy of the approved financial assurance.

3 GENERAL CONDITIONS

3.1 ACCESS AND INSPECTION

The permittee shall allow the Commissioner or his/her representative access to the permitted facility at reasonable times to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit, state laws, and regulations.

3.2 INFORMATION ACCESS

Except where protected from disclosure by applicable State or Federal law, all records and reports submitted in accordance with the terms of this permit shall be available for public inspection at the State of Alaska, Department of Environmental Conservation, Fairbanks, Alaska.

3.3 CIVIL AND CRIMINAL LIABILITY

Nothing in this permit shall relieve the permittee from any potential civil or criminal liability for noncompliance with the permit or with applicable laws.

3.4 AVAILABILITY

The permittee shall post or maintain a copy of this permit available to the public at the facility.

3.5 ADVERSE IMPACT

The permittee shall take all necessary means to minimize any adverse impacts to the receiving waters or lands resulting from noncompliance with any limitation specified in this permit, including any additional monitoring needed to determine the nature and impact of the noncomplying activity. The permittee shall cleanup and restore all areas adversely impacted by the noncompliance.

3.6 CULTURAL OR PALEONTOLOGICAL RESOURCES

Should cultural or paleontological resources be discovered as a result of this activity, work, which would disturb such resources, is to be stopped, and the State Historic Preservation Office, Division of Parks and Outdoor Recreation, ADNR (907) 465-4563, is to be notified promptly.

3.7 APPLICATIONS FOR RENEWAL

In accordance with 18 AAC 15.100(d), an application for renewal or amendment of this permit must be made no later than 120 days before the expiration date of the permit or the planned effective date of the amendment.

3.8 OTHER LEGAL OBLIGATIONS

This permit does not relieve the permittee from the duty to obtain any other necessary permits from the department or from other local, state, or federal agencies, and to comply with the requirements contained in any such permits. All activities conducted and all plans implemented by the permittee pursuant to the terms of this permit shall comply with all applicable local, state, and federal laws and regulations.

3.9 TRANSFER OF OWNERSHIP

In the event of any change in control or ownership of the permitted facility, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Director of the Division of Water. The original permittee remains responsible for permit compliance unless and until the succeeding owner or controller agrees in writing to assume such responsibility, and the department approves assignment of the permit. The department will not unreasonably withhold such approval.

As between the State and the permittee, no transfer of this permit shall relieve the permittee of any liability arising out of operations conducted prior to such transfer, regardless of whether such liability accrues before or after such transfer.

3.10 TOXIC POLLUTANTS

If during the life of this permit a new or revised toxic pollutant (including oil, grease, or solvents) concentration standard is established in accordance with 18 AAC 70 for a pollutant managed at this facility and that standard is more stringent than previously, then upon the effective date of the new rule, this permit automatically adopts the new toxic pollutant concentration standard and applies it to management of facility wastes.

3.11 POLLUTION PREVENTION

In order to prevent and minimize present and future pollution, when making management decisions that affect waste generation, the permittee shall consider the following order of priority options as outlined in AS 46.06.021:

- 1st waste source reduction,
- 2nd recycling of waste,
- 3rd waste treatment, and
- 4th waste disposal.

4 FINANCIAL RESPONSIBILITY

4.1 PROOF OF FINANCIAL RESPONSIBILITY

Under AS 46.03.100(f), 18 AAC 15.090, and 18 AAC 60.265, the department is required to secure proof of financial responsibility for reclamation and long term care, maintenance, including wastewater treatment, and monitoring at the facility.

4.1.1 The permittee shall provide the department with proof of financial responsibility for reclamation and closure of the facilities and post-closure monitoring. The proof of financial responsibility shall cover costs incurred for suspension of operations, reclamation and closure, near and long term wastewater treatment, and monitoring of all mine facilities, including the mill area, TSF, MWD, Overburden Dump, Main Pit, Oxide Dump, Qanaiyaq Pit Dump, Low Grade Ore Stockpile, mill site, and related facilities, shall cover the activities set out in Section 4, and shall be in the amount shown in Section 4. An overview of the areas covered by the financial responsibility for reclamation and closure is shown in Figure 6.1.

4.1.2 The department will review and modify if necessary, the financial responsibility requirements including adjustments for concurrent reclamation, expansion, or other changes to the operation of the facility. The permittee shall address the adequacy of

the financial responsibility in the annual report required in Section 2.6.3.

- 4.1.3 The proof of financial responsibility may be in the form of a trust fund, surety bond, letter of credit, insurance, or another department-approved mechanism.
- 4.1.4 Approved proof of financial responsibility must remain available through the post-closure period and may not be released in its entirety until the department certifies in writing that closure of the facility and the required post-closure monitoring have been successfully concluded or that another entity has assumed responsibility for permit compliance, reclamation and closure activities, and post-closure monitoring.
- 4.1.5 The permittee must provide acceptable proof of financial responsibility within 60 days of the permit's effective date. The department will accept or reject the financial surety as expeditiously as possible but in no event later than 30 days after its receipt.
- 4.1.6 If the permittee is unable to provide acceptable proof of financial responsibility to the department, as approved by the department in writing, within the time period stated above, this permit will expire automatically at that time, notwithstanding any other approvals to the contrary, unless the department's failure to act is responsible for the delay in accepting or rejecting this proof.
- 4.1.7 If the permittee fails to comply with the terms and conditions of this permit and if the department concludes that such failure may prevent, inhibit or delay satisfactory reclamation and closure or post-closure monitoring of the facility, then the department may exercise its rights, under an approved mechanism, to access financial responsibility funds and use them for reclamation and closure and post-closure activities.
- 4.1.8 The permittee can apply to have the amount of the financial responsibility adjusted during the life of the permit if, for example, concurrent reclamation has been completed.

4.2 AMOUNT OF FINANCIAL RESPONSIBILITY

The total proof of financial responsibility for the life of this permit, unless modified, shall be **\$585,662,000**. A detailed breakdown of the financial responsibility cost estimate can be found in the *RP*. Details of the required financial responsibility for two years of suspended activities followed by two years of reclamation can be found in Table 1.

Table 1: Financial Assurance for Reclamation Phase

| Years <i>(zero "0" indicates the beginning of the closure sequence and the subsequent years indicate year's end)</i> | Annual Cash Flows¹ <i>(years 1-4 water management and earthwork)</i> | Present Value <i>(undiscounted)</i> |
|---|---|---|
| 0 | | \$220,765,000 |
| 1 | \$17,677,000 | |
| 2 | \$12,972,000 | |
| 3 | \$93,007,000 | |
| 4 | \$97,109,000 | |
| <p>Note: 1. This column represents the present value (direct plus indirect costs) for reclamation costs that are scheduled during the first four years after the termination of mining and milling. Amounts include direct costs for care and maintenance associated with two years of suspended activities followed by two years of earthwork and water management, which are detailed in the <i>Reclamation Plan</i>. All values have been round to the nearest thousand.</p> | | |

Details of the required financial responsibility for long-term care and water treatment can be found in Table 2. Tables 1 and 2 are provided for clarity and not as an attempt to compartmentalize the financial responsibility funds.

Table 2: Financial Assurance for Long Term Care and Water Treatment

| Years <i>(zero "0" indicates the beginning of the closure sequence and the subsequent years indicate year's end)</i> | Annual Cash Flows¹ <i>(years 5-97+)</i> | Net Present Value² <i>(4.30% real rate of return)</i> |
|--|--|--|
| 0 | \$0 | \$364,897,000 |
| 1 | \$0 | |
| 2 | \$0 | |
| 3 | \$0 | |

| | | |
|----|--------------|--|
| 4 | \$0 | |
| 5 | \$22,125,000 | |
| 6 | \$20,145,000 | |
| 7 | \$19,786,000 | |
| 8 | \$19,188,000 | |
| 9 | \$18,983,000 | |
| 10 | \$18,392,000 | |
| 11 | \$18,395,000 | |
| 12 | \$17,513,000 | |
| 13 | \$17,053,000 | |
| 14 | \$17,146,000 | |
| 15 | \$17,391,000 | |
| 16 | \$16,610,000 | |
| 17 | \$18,418,000 | |
| 18 | \$16,319,000 | |
| 19 | \$29,631,000 | |
| 20 | \$15,999,000 | |
| 21 | \$15,895,000 | |
| 22 | \$15,908,000 | |
| 23 | \$15,494,000 | |
| 24 | \$16,297,000 | |
| 25 | \$16,400,000 | |
| 26 | \$15,381,000 | |
| 27 | \$15,374,000 | |
| 28 | \$15,374,000 | |
| 29 | \$15,374,000 | |
| 30 | \$15,558,000 | |
| 31 | \$15,288,000 | |
| 32 | \$15,288,000 | |
| 33 | \$15,288,000 | |
| 34 | \$55,332,000 | |
| 35 | \$15,902,000 | |
| 36 | \$15,220,000 | |
| 37 | \$17,065,000 | |
| 38 | \$15,220,000 | |
| 39 | \$15,220,000 | |
| 40 | \$15,220,000 | |
| 41 | \$15,220,000 | |
| 42 | \$15,220,000 | |
| 43 | \$15,220,000 | |
| 44 | \$16,106,000 | |
| 45 | \$15,902,000 | |

| | | |
|----|--------------|--|
| 46 | \$15,220,000 | |
| 47 | \$15,220,000 | |
| 48 | \$15,220,000 | |
| 49 | \$28,591,000 | |
| 50 | \$15,220,000 | |
| 51 | \$15,220,000 | |
| 52 | \$15,220,000 | |
| 53 | \$15,220,000 | |
| 54 | \$15,220,000 | |
| 55 | \$15,902,000 | |
| 56 | \$15,220,000 | |
| 57 | \$17,065,000 | |
| 58 | \$15,220,000 | |
| 59 | \$15,220,000 | |
| 60 | \$15,220,000 | |
| 61 | \$15,220,000 | |
| 62 | \$15,220,000 | |
| 63 | \$15,220,000 | |
| 64 | \$56,218,000 | |
| 65 | \$15,902,000 | |
| 66 | \$15,220,000 | |
| 67 | \$15,220,000 | |
| 68 | \$15,220,000 | |
| 69 | \$15,220,000 | |
| 70 | \$15,220,000 | |
| 71 | \$15,220,000 | |
| 72 | \$15,220,000 | |
| 73 | \$15,220,000 | |
| 74 | \$15,220,000 | |
| 75 | \$15,902,000 | |
| 76 | \$15,220,000 | |
| 77 | \$17,065,000 | |
| 78 | \$15,220,000 | |
| 79 | \$28,591,000 | |
| 80 | \$15,220,000 | |
| 81 | \$15,220,000 | |
| 82 | \$15,220,000 | |
| 83 | \$15,220,000 | |
| 84 | \$16,106,000 | |
| 85 | \$15,902,000 | |
| 86 | \$15,220,000 | |
| 87 | \$15,220,000 | |

| | | |
|----|---------------|--|
| 88 | \$15,220,000 | |
| 89 | \$15,220,000 | |
| 90 | \$15,220,000 | |
| 91 | \$15,220,000 | |
| 92 | \$15,220,000 | |
| 93 | \$15,220,000 | |
| 94 | \$55,332,000 | |
| 95 | \$15,902,000 | |
| 96 | \$15,220,000 | |
| 97 | \$122,963,000 | |

Notes:

1. This column represents the present (undiscounted) value for long term care and maintenance, which begins after two years of suspended activities followed by two years of earthwork. Costs include the present value for long term maintenance during years 5 through 97 and beyond. The total includes both direct and indirect costs that are detailed in the *Reclamation Plan*.

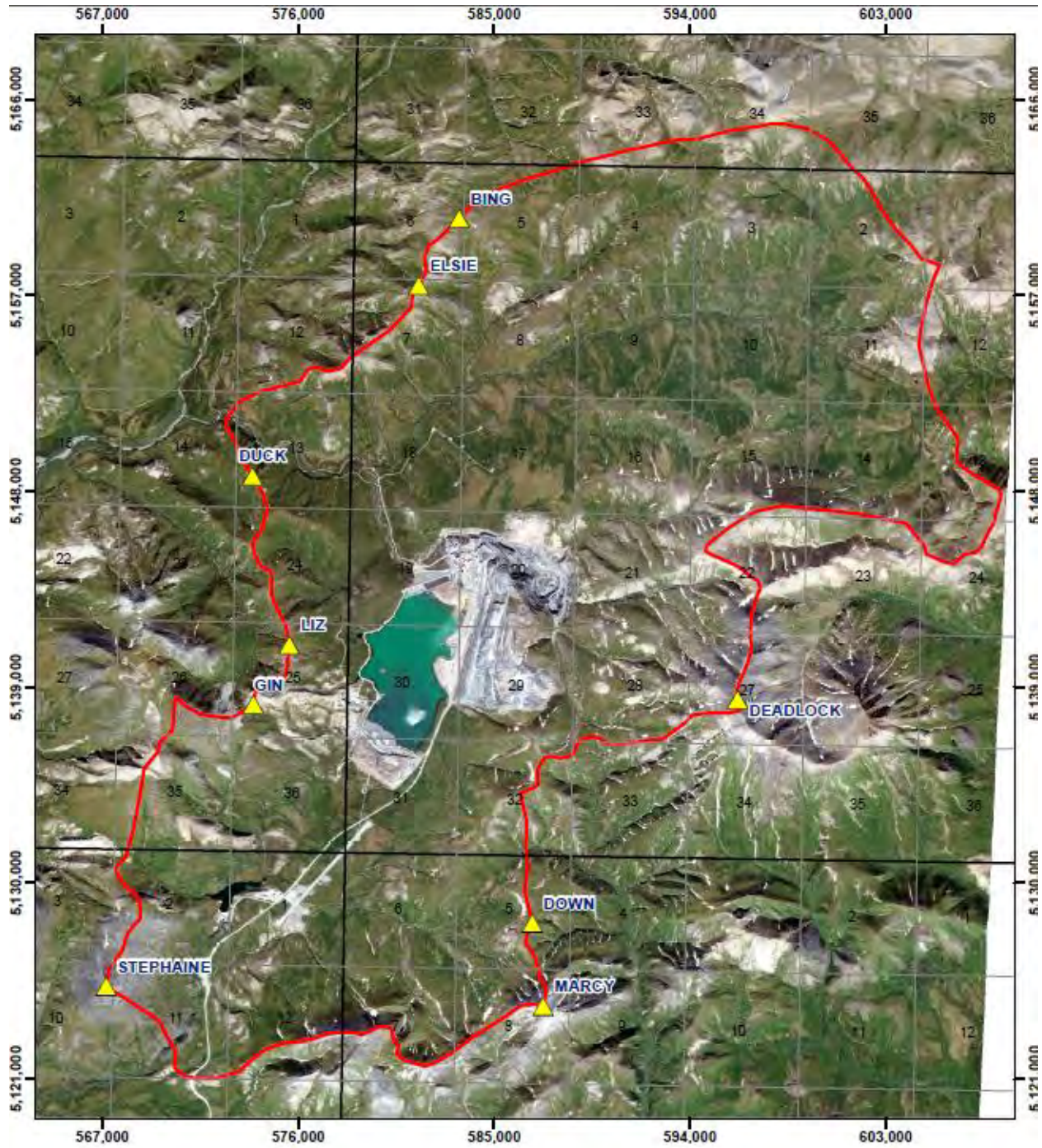
2. This amount represents the net present (discounted) value assuming a real rate of return of 4.30%.

5 GLOSSARY OF TERMS


| | |
|-----------|---|
| AAC | Alaska Administrative Code |
| ADNR | Alaska Department of Natural Resources |
| APDES | Alaska Pollutant Discharge Elimination System |
| AS | Alaska Statutes |
| EPA | U.S. Environmental Protection Agency |
| IWMP | Integrated Waste Management Plan |
| MDL | Method Detection Limit |
| ML | Minimum Level of Quantification |
| MSWLF | Municipal Solid Waste Landfill |
| MWD | Main Waste Dump |
| Permittee | Teck Alaska, Incorporated |
| QAPP | Quality Assurance Plan |
| RP | Reclamation Plan |
| TAK | Teck Alaska, Incorporated |
| TSF | Tailings Storage Facility |
| WAD | Weak Acid Dissociable |
| WQS | Alaska Water Quality Standards |
| WTP | Water Treatment Plant |

6 FIGURES

6.1 FACILITY BOUNDARY MAP



Teck Alaska Incorporated Red Dog Mine

-  Survey Control Boundary
-  Solid Waste Permit Boundary



6.2 MINE DUMP & STOCKPILE LOCATIONS



6.3 MONITORING PLAN FACILITY MAP

