



ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

INDIVIDUAL PERMIT – DRAFT

Permit Number: AK0038652

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

In compliance with the provisions of the Clean Water Act (CWA), 33 U.S.C. §1251 *et seq.*, as amended by the Water Quality Act of 1987, P.L. 100-4, this permit is issued under provisions of Alaska Statutes (AS) 46.03; the Alaska Administrative Code (AAC) as amended; and other applicable state laws and regulations.

TECK ALASKA, INCORPORATED, as operator of Red Dog Mine,

is authorized to discharge storm water from the Red Dog Mine in the DeLong Mountains of Alaska and treated wastewater at the following location:

Outfall	Receiving Waterbody	Latitude	Longitude
001	Middle Fork Red Dog Creek	68° 4' 17" N	162° 52' 5" W

In accordance with the discharge point effluent limits, monitoring, requirements, and other conditions set forth herein:

This permit shall become effective **pending**

This permit and the authorization to discharge shall expire after **pending**

The permittee shall reapply for a permit reissuance on or before **pending**, 180 days before the expiration of this permit, to continue operations and discharge at the facility beyond the term of this permit.

The permittee shall post or maintain a copy of this permit to discharge at the facility and make it available to the public, employees, and subcontractors at the facility.

DRAFT

DRAFT

Signature

Date

Printed Name

Title

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SCHEDULE OF SUBMISSIONS

The Schedule of Submissions summarizes some of the required submissions and activities the permittee must complete or revise and submit to the Alaska Department of Environmental Conservation (Department or DEC) during the term of this permit. The permittee is responsible for all submissions and activities even if they are not summarized below.

Table 1: Schedule of Submissions

Part	Submittal or Completion	Frequency	Due Date	Submit to^a
1.2.1	Written notice that discharge from Outfall 001 has commenced	As necessary	Within 24 hours of starting discharge from Outfall 001	Permitting
1.2.8.5	Report comparing calculated Total Dissolved Solids (TDS) to measured TDS	Annually	With the final Discharge Monitoring Report (DMR) of the discharge season	Compliance
1.2.8.6	TDS Management Plan	1/permit cycle	Within 120 days after the effective date of the permit	Permitting
1.4.3.2	Bioassessment Monitoring Report	Annually	May 15 th of the next year	Permitting
1.6.8.2	Full Whole Effluent Toxicity (WET) report	Bimonthly during discharge season	By the end of the month following receipt of initial results	Compliance
1.7	Annual Water Quality Monitoring Summary	Annually	March 1 st of the next year	Compliance
2.1	Quality Assurance Project Plan (QAPP) update and implementation notification	1/permit cycle	Within 60 days after the effective date of the permit	Compliance
2.2.1	Written notification that the Site-Management Pollution Prevention Plan has been developed and implemented	1/permit cycle	Within 60 days after the effective date of the permit	Compliance
2.2.7	Site-Management Pollution Prevention Plan report	Annually	March 1 st of the next year	Compliance
Appendix A, 1.3	Application for Permit Reissuance	1/permit cycle	180 days before expiration of the permit	Permitting
Appendix A, 3.2	DMR	Monthly	Postmarked or submitted electronically on or before the 20 th day of the next month	Compliance
Appendix A, 3.4	Oral notification of noncompliance	As necessary	Within 24 hours of discovering noncompliance	Compliance ^b

Part	Submittal or Completion	Frequency	Due Date	Submit to ^a
Appendix A, 3.4	Written documentation of noncompliance	As necessary	Within 5 days of discovering noncompliance	Compliance
a. See Appendix A.1.1 for addresses. b. Oral notifications must be reported to the Department's noncompliance reporting hotline: 1-907-269-4114 (from Alaska) or 1-877-569-4114 (nationwide).				

1.0 LIMITATIONS AND MONITORING REQUIREMENTS

1.1 Discharge Authorization

During the effective period of this permit, the permittee is authorized to discharge pollutants from outfalls specified herein to the Middle Fork Red Dog Creek and tundra wetlands, within the limits and subject to the conditions set forth herein. This permit authorizes the discharge of only those pollutants resulting from facility processes, waste streams, and operations that have been clearly identified in the permit application process.

1.2 Effluent Limits and Monitoring—Outfall 001

- 1.2.1 There shall be no discharge from Outfall 001 unless there is sufficient flow of water in Main Stem Red Dog Creek to determine compliance with TDS limitations as described in Part 1.2.8. The permittee must supply written notice by mail, facsimile, or electronic mail documenting the start of discharge to DEC within 24 hours.
- 1.2.2 The permittee must limit and monitor discharges from Outfall 001 to the Middle Fork Red Dog Creek as specified below in Table 2. All values represent maximum effluent limits unless otherwise indicated. The permittee must comply with the effluent limits in the table at all times unless otherwise indicated, regardless of the frequency of monitoring or reporting required by other provisions of this permit.

Table 2: Effluent Limits and Monitoring Frequencies for Outfall 001

Parameter	Maximum Daily Limit	Average Monthly Limit	Units	Minimum Sample Frequency	Sample Type ¹
Ammonia as N,	---	---	mg/L ²	1/week	24 hour composite
Biochemical Oxygen Demand (BOD ₅)	---	---	mg/L	1/2 months ³	24 hour composite
Barium ⁴	---	---	µg/L ⁵	1/month	24 hour composite
Cadmium ⁴	3.7	1.4	µg/L	1/week	24 hour composite
Chlorine, Total Residual	---	---	µg/L	1/2 months	Grab
Copper ⁴	52	21	µg/L	1/week	24 hour composite
Cyanide, WAD ⁶	---	---	µg/L	1/week	Grab
Lead ⁴	34	11	µg/L	1/month	24 hour composite
Mercury, Total	0.018	0.010	µg/L	1/month	24 hour composite
Organic Priority Pollutant Scan ⁷	---	---	µg/L	1/year	24 hour composite
pH	Within the range of 6.5 to 10.5		s.u.	1/week	Grab
Selenium ⁴	17	11		1/week	24 hour composite
Temperature	---		°C	1/week	Grab

Parameter	Maximum Daily Limit	Average Monthly Limit	Units	Minimum Sample Frequency	Sample Type ¹
Total Dissolved Solids (TDS)	See Part 1.2.8.		mg/L	1/week	24 hour composite
TDS, Anions and Cations⁸	---	---	µg/L	1/month	24 hour composite
Total Suspended Solids (TSS)	30	20	mg/L	1/week	24 hour composite
Volume, cumulative	See Part 1.2.3.		gallons	---	Continuous recording
Whole Effluent Toxicity (WET)	12.2	9.7	TU _c ⁹	1/2 months	See Part 1.6
Zinc³	388	221	µg/L	1/month	24 hour composite

1. Effluent samples collected shall be representative of the effluent discharged without dilution from or contact with any outside sources. Results of analyses conducted under Part 1.2.2 shall be submitted monthly on the discharge monitoring report.
2. Milligrams per liter
3. Once every two months
4. All metals shall be analyzed as total recoverable unless otherwise indicated.
5. Micrograms per liter
6. Weak acid dissociable
7. Volatile organics shall be monitored using EPA analytical method 624, and semi-volatile organics shall be monitored using EPA analytical method 625. The pollutants assayed should include the following pollutants listed in Table 6-C of DEC's APDES Permit Application Form 2C: (1) 1V-31V – volatile organic compounds, (2) 1A- 11A – acid fraction compounds, and (3) 1B – 46B base/neutral compounds.
8. This monitoring shall include carbonates, chlorides, sulfates, potassium, magnesium, calcium, and sodium. The carbonate analysis should be estimated based on direct measurement of alkalinity.
9. Chronic toxicity units

1.2.3 The maximum cumulative volume discharged from Outfall 001 shall not exceed 2.418 billion gallons from January 1st through December 31st every year. The permittee shall report the cumulative volume discharged from Outfall 001 for that year to DEC on the discharge monitoring report (DMR) for each month. For example, if the permittee discharges 1 million gallons from Outfall 001 in May and 2 million gallons in June, the June DMR shall state a cumulative flow discharged from Outfall 001 of 3 million gallons (1 million + 2 million = 3 million). In addition, the permittee shall report the total volume discharged each month.

1.2.4 The permittee must not discharge any floating solids, visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.

1.2.5 Hardness of the effluent shall be calculated monthly using the data from the analysis required in endnote 8 of Table 2. The hardness value shall be reported on the DMR.

1.2.6 Additional Monitoring and Reporting Requirements:

1.2.6.1 The permittee shall conduct analyses using analytical methods approved under 40 CFR 136 (18 AAC 83.010(f)). EPA has approved the use of Alternative Test Procedures (ATP) for cyanide (SM 4500 CN-I), anions (300), and metals (200.8) under 40 CFR 136.5 (18 AAC 83.010(f)) for use in this permit.

1.2.6.2 For all effluent monitoring, the permittee must use analytical methods that can achieve a minimum level of quantification (ML) less than the effluent

limitation unless a compliance level is specified. For parameters without effluent limitations, the following MLs shall be used:

1.2.6.2.1 Ammonia: 2.9 mg/L

1.2.6.2.2 Barium: 60 µg/L

1.2.6.2.3 BOD₅: 10 mg/L

1.2.6.2.4 Chlorine, total residual (TRC): 100 µg/L

1.2.6.2.5 Cyanide, WAD: 5.2 µg/L

1.2.6.3 As part of the development of the Quality Assurance Project Plan (see Part 2.1) the permittee shall specify the analytical test method that will be used to achieve each ML.

1.2.6.4 For purposes of calculating monthly averages, zero may be assigned for values less than the method detection limit (MDL), the {numeric value of the MDL} may be assigned for values between the MDL and the ML. If the average value is less than the MDL, the permittee must report “less than {numeric value of the MDL}” and if the average value is less than the ML, the permittee must report “less than {numeric value of the ML}.” If a value is equal to or greater than the ML, the permittee must report and use the actual value. The resulting average value must be compared to the effluent limitation to assess compliance.

1.2.6.5 Valid test results from split samples shall be reported on the DMR. For reporting an average on the DMR, individual valid results for each test from a split sample are averaged first to determine a sample value. That value is averaged with other sample results obtained in the reporting period and the average of all sample results reported. For reporting the maximum on the DMR, individual valid results for each test from a split sample are averaged first to determine a sample value. That value is compared to other sample results obtained in the reporting period and the maximum of all sample results reported. For the purposes of reporting, split samples are reported as a single sample regardless of the number of times it is split. All laboratories used for split sample analysis shall be identified on the DMR attachment.

1.2.7 Total Residual Chlorine shall be analyzed immediately after sample collection.

1.2.8 TDS Limitations, Monitoring Requirements, and Management Plan

1.2.8.1 The permittee shall limit the TDS load discharged from Outfall 001 so as to maintain in-stream TDS concentrations at or below all of the following:

1.2.8.1.1 At the edge of the mixing zone (Station 151) in Main Stem Red Dog Creek: 1500 mg/L throughout the discharge season,

- 1.2.8.1.2 At the edge of the mixing zone (Station 150) in Ikalukrok Creek: 1000 mg/L throughout the discharge season, and
- 1.2.8.1.3 Station 160: 500 mg/L from July 25th through the end of the discharge season.
- 1.2.8.2 When discharging, monitoring by direct laboratory testing shall be conducted. All samples of the receiving waters for TDS shall be grab samples, while effluent samples shall be composite samples as shown in Table 2. Sample collection shall be as follows:
 - 1.2.8.2.1 TDS shall be monitored once per week at Station 151, Station 150, Station 160, and the effluent.
 - 1.2.8.2.2 Conductivity and temperature shall be monitored concurrently with TDS sampling at Stations 151, 150, and 160.
- 1.2.8.3 The permittee shall calculate and record the allowable flow volume from Outfall 001 at least twice each day using the formulas below and shall submit all of the data involved in those calculations (including the times that measurements were taken), and the calculation results, each month along with the DMR. The permittee shall base each calculation on data collected within two hours of each shift change, and shall make each calculation within one hour of the collection of data. The allowable flow calculated from measurements taken at Station 151 and the Outfall must reflect the stream conditions at the station and the Outfall flow that are occurring at approximately the same time frame (i.e., the conductivity and flow measurements at Station 151 and the flow from the Outfall must be taken within 30 minutes of each other). For the purposes of these calculations, instantaneous flow is sufficient. The following shall be collected and calculated:

EFFLUENT

- 1.2.8.3.1 Assume the effluent concentration (C_e) is equal to 10% above the highest measured effluent value during the 5 years preceding the current discharge season.
- 1.2.8.3.2 Measure the effluent flow (Q_e).

STATION 151

- 1.2.8.3.3 Measure conductivity at Station 151
- 1.2.8.3.4 Calculate the total TDS concentration at Station 151 ($C_{151(\text{total})}$) using the measured conductivity at Station 151.
- 1.2.8.3.5 Measure the total flow at Station 151 ($Q_{151(\text{total})}$).
- 1.2.8.3.6 Calculate the allowable effluent flow ($Q_{\text{allowable}}$) expected to result in 1500 mg/L TDS at Station 151 using the following equation:

$$Q_{\text{allowable}} = Q_e + (Q_{151(\text{total})}(1500 - C_{151(\text{total})})/(C_e - 1500)$$

- 1.2.8.4 Calculations of TDS concentrations based on conductivity shall be made using correlation curves that are based on TDS and conductivity measurements made pursuant to this permit.
- 1.2.8.5 After the end of each discharge season, the permittee shall submit a report, with the final DMR for the season, which compares the calculated TDS values in Main Stem Red Dog Creek (based on the measured conductivity in the creek) to the actual measured values. The report shall include the following information:
- 1.2.8.5.1 Measured TDS concentration at Station 151, and the date and time each sample was taken,
- 1.2.8.5.2 Measured conductivity at Station 151, and predicted TDS concentration at Station 151 at the date and approximate time the samples were taken in Part 1.2.8.3.3 (i.e. within one hour of sample collection).
- 1.2.8.6 TDS Management Plan. The permittee shall prepare and implement a TDS Management Plan. The TDS Management Plan must be prepared and submitted to DEC within 120 days of the effective date of the permit. The TDS Plan will include information on actions the permittee will take to provide enhanced treatment for TDS and/or source control to ensure that the permittee will be able to discharge through Outfall 001, in compliance with the TDS limits, a sufficient volume of wastewater to maintain a safe water level behind the tailings impoundment dam. The permittee will report annually, with the Annual Report required in Part 1.7., progress made toward implementing the TDS Plan and data that demonstrates the tailings impoundment water level is below the safe level per the current Certificate of Approval to Operate a Dam.

1.3 Other Requirements

- 1.3.1 Mine drainage shall be:
- 1.3.1.1 Directed into the tailing impoundment, or
- 1.3.1.2 Otherwise retained unless and/or until it can be discharged through Outfall 001 in accordance with the permit limitations.
- 1.3.2 The mine drainage from the ore site not retained in the pit (including commingled seeps) shall be collected by the Mine Drainage Collection System. The water collected at the Mine Drainage Collection Dam shall be:
- 1.3.2.1 Pumped into the tailings impoundment; or

- 1.3.2.2 Retained until it can be treated or otherwise discharged in accordance with the permit terms and conditions.
- 1.3.3 When water in the Mine Drainage Collection System is pumped into the tailings impoundment, the pumped volume shall be recorded. The total volume pumped annually shall be recorded and submitted in the Annual Water Monitoring Summary Report required in Part 1.7.
- 1.3.4 The permittee shall not discharge water in the Mine Drainage Collection System into Red Dog Creek except in compliance with this permit through authorized outfalls.
- 1.3.5 Water in the Seepage Pond and related seepages, at the base of the tailings impoundment dam, shall be pumped back into the tailings impoundment, pumped to the high density solids treatment facility, recycled through the mill, or reused as otherwise appropriate.
- 1.3.6 The permittee shall not discharge water from the Seepage Pond into Red Dog Creek except in compliance with this permit through authorized outfalls.
- 1.3.7 The permittee shall not discharge water from the tailings impoundment into Red Dog Creek except in compliance with this permit through authorized outfalls.
- 1.3.8 The permittee shall operate and maintain its retention structures (e.g., Mine Drainage Collection System, Seepage Pond and tailings impoundment) so as to prevent leaks to waters of the United States.
- 1.3.9 The permittee may use treated wastewater as a dust suppressant on roads, pads and airport runways within the jurisdiction of this permit. Best management practices shall be used to insure that all waters sprayed do not drain into waters of the U.S.
- 1.3.10 The permittee shall not use treated wastewater as a dust suppressant on the Delong Mountain Regional Transportation System (DMTS) Port Road south of its intersection with the Tailings Impoundment back-dam road turnoff.
- 1.3.11 The permittee shall ensure that discharges from the Red Dog Mine do not cause downstream water quality problems, such as the exclusion of fish or fish kills in Ikalukrok Creek or the exclusion of fish migrating up the North Fork of Red Dog Creek.

1.4 Ambient Monitoring Requirements

1.4.1 Water Quality Monitoring

- 1.4.1.1 The permittee shall collect samples at the ambient monitoring stations listed below. See Figure 1: Ambient Monitoring Sampling Stations.

1.4.1.1.1 Station 160: downstream of Station 150 in Ikalukrok Creek

1.4.1.1.2 Station 150: downstream boundary of the mixing zone in Ikalukrok Creek downstream of confluence with the Main Stem

1.4.1.1.3 Station 151: downstream boundary of the mixing zone for TDS, ammonia, selenium, cadmium, and cyanide in Main Stem and the monitoring station for the pH mixing zone

1.4.1.1.4 Station 12: North Fork of Red Dog Creek

1.4.1.1.5 Station 140: Middle Fork Red Dog Creek upstream of the influence of Outfall 001

1.4.1.2 Ambient monitoring shall be conducted when there is flowing water (under ice or during open water conditions). For example, if there is flowing water at Station 151, but not at the other stations, the permittee shall sample at Station 151.

1.4.1.3 Ambient monitoring, outlined in this section, may be discontinued when the permittee has ceased discharging from Outfall 001 to Middle Fork Red Dog Creek for a period of seven consecutive days. Ambient monitoring shall recommence when the permittee re-initiates a discharge from Outfall 001.

1.4.1.4 All ambient samples shall be grab samples.

1.4.1.5 Ambient monitoring results for Stations 150, 151 and 160 shall be submitted to DEC with the monthly DMR. Other ambient monitoring results shall be submitted in the Annual Water Monitoring Summary Report required in Part 1.7.

1.4.1.6 The following ambient water quality monitoring listed in Table 3 shall be conducted.

Table 3: Ambient Water Quality Monitoring

Parameter ¹	Station 160 ²	Station 150 ²	Station 151 ²	Station 12 ²	Station 140 ²
Aluminum	2/month	---	2/month	2/month	2/month
Cadmium	2/month	---	2/month	2/month	2/month
Chromium	2/month	---	2/month	2/month	2/month
Copper	2/month	---	2/month	2/month	2/month
Cyanide, WAD	---	---	2/month	---	---
Iron	2/month	---	2/month	2/month	2/month
Lead	2/month	---	2/month	2/month	2/month
Mercury, total	2/month	---	2/month	2/month	2/month
Nickel	2/month	---	2/month	2/month	2/month

Parameter ¹	Station 160 ²	Station 150 ²	Station 151 ²	Station 12 ²	Station 140 ²
Selenium	2/month	---	2/month	2/month	2/month
Zinc	2/month	---	2/month	2/month	2/month
Total Ammonia as N, mg/L	2/month	---	2/month	2/month	2/month
Conductivity, $\mu\text{S}/\text{cm}^3$	1/week	1/week	1/week	2/month	2/month
Hardness, mg/L CaCO_3	2/month	---	2/month	2/month	2/month
Temperature, °Celsius	2/month	---	2/month	2/month	2/month
TDS, mg/L	1/week	1/week	1/week	2/month	2/month
TDS Anions and Cations⁴	1/month	1/month	1/month	---	---
pH, s.u.	2/month	---	2/month	2/month	2/month
Turbidity, NTU	---	---	---	1/month	1/month

1. Monitoring for metals shall be in $\mu\text{g}/\text{L}$ and total recoverable unless otherwise noted. For additional monitoring requirements for cyanide, see Part 1.2.6.1.
2. The permittee shall spread out the sample collection dates so that the samples collected are representative of the calendar month. To the extent practicable, ambient monitoring shall coincide with effluent monitoring. If weather, safety, shipping, and other environmental constraints prevent the permittee from collecting representative samples, the permittee shall document the condition which prevented the representative samples from being collected on the discharge monitoring reports.
3. Microsiemens per centimeter
4. This monitoring shall include carbonates, chlorides, sulfates, potassium, magnesium, calcium, and sodium. The carbonate analysis should be estimated based on direct measurement of alkalinity.

1.4.1.7 Streamflow shall be determined twice daily at Station 151. Streamflow shall be determined using standard methods recognized by the U.S. Geological Survey: gauging station data, discharge measurement, or estimation using all available information. Estimates must not be the sole means of determining flow at a site at all times; some discharge measurements shall be made for verification. "Discharge measurement" means measuring widths, depths, and velocities using a tape or tagline, sounding equipment, and/or current meter.

1.4.1.1 Streamflow data and the methods used to determine streamflow shall be submitted to DEC monthly with the DMR.

1.4.2 Precipitation and Evaporation Monitoring

1.4.2.1 The permittee shall establish and maintain monitoring stations at the mine site to determine the net annual precipitation rate.

1.4.2.2 Precipitation (rain and snow) data shall be recorded daily.

1.4.2.3 Evaporation data shall be recorded daily from June 1st to August 31st every year. Evaporation data shall be gathered earlier if the evaporation pan is not frozen. The permittee shall operate the evaporation pan properly to assure that the daily evaporation rate can be determined.

1.4.2.4 Spring snow pack readings shall be taken before spring melt each year. For snow pack readings, the measurement shall be reported with the Annual Report described in Part 1.7.

1.4.2.5 Records of precipitation and evaporation monitoring shall include the date and time.

1.4.2.6 The precipitation and evaporation monitoring records shall be kept on site and made available to DEC upon request.

1.4.2.7 The total precipitation and total evaporation records shall be reported in the Annual Report described in Part 1.7. The Annual Report shall also include the net annual precipitation volume compared to the volume of water discharged through Outfall 001.

1.4.3 Bioassessment Monitoring Program

1.4.3.1 Within 60 days of the effective date of the permit, the permittee shall submit for review and approval to DEC, an updated version of the Biomonitoring Plan – ADF&G Methods for Aquatic Life Monitoring to Satisfy requirements under 1998 NPDES Permit – submitted by Cominco Alaska, Inc., 1998, which was designed to detect possible aquatic community changes related to the mine effluent as shown in Table 4.

Table 4: Bioassessment Program

Sample Site	Factors Measured
North Fork Red Dog Creek	<ul style="list-style-type: none"> • Periphyton (as chlorophyll-a concentrations) • Aquatic invertebrates: taxonomic richness and abundance • Fish presence and use
Main Stem Red Dog Creek	<ul style="list-style-type: none"> • Periphyton (as chlorophyll-a concentrations) • Aquatic invertebrates: taxonomic richness and abundance • Fish presence and use
Ikalukrok Creek	<ul style="list-style-type: none"> • Periphyton (as chlorophyll-a concentrations) • Aquatic invertebrates: taxonomic richness and abundance • Fish presence and use

1.4.3.2 The permittee shall summarize the results of the bioassessment program and submit it to DEC by May 15th of the following year.

1.5 Mixing Zones

- 1.5.1 Mixing Zone 1 in the Middle Fork of Red Dog Creek (Middle Fork) extends from Outfall 001 to the confluence with the North Fork of Red Dog Creek. The Middle Fork mixing zone is about 7,000 feet long and is authorized only for pH.
- 1.5.2 Mixing Zone 2 in the Main Stem of Red Dog Creek (Main Stem) extends from the confluence of the Lower Middle Fork with the North Fork to Station 151. The Main Stem mixing zone is approximately 1,930 feet long and provides mixing in the ratio of 1.5 parts receiving flow to 1 part effluent inflow for a dilution factor of 2.5. This mixing zone is authorized for the following parameters: TDS, ammonia, selenium, cadmium, and weak acid dissociable cyanide.
- 1.5.3 Mixing Zone 3 in Ikalukrok Creek extends from the confluence of the Main Stem and Ikalukrok Creek about 3,420 feet downstream to Station 150. The Ikalukrok Creek mixing zone provides mixing in a ratio of 1 part receiving (Ikalukrok) flow to 1 part Main Stem flow for a dilution factor of 2. Mixing Zone 3 is authorized only for TDS.

1.6 Whole Effluent Toxicity Testing Requirements

- 1.6.1 The Permittee must conduct bimonthly chronic whole effluent toxicity (WET) tests on effluent samples from Outfall 001. Testing must be conducted in accordance with Permit Parts 1.6.2 through 1.6.8.
- 1.6.2 Chronic toxicity testing must be conducted on a grab sample of the effluent. Additionally, a split of each sample collected must be analyzed for the chemical and physical parameters required in Permit Part 1.2. Samples for toxicity testing should be of adequate size to accommodate the split sample. When the timing of sample collection coincides with that of the sampling required in Permit Part 1.2, analysis of the split sample will fulfill the requirements of these parts as well.
- 1.6.3 Chronic Test Species and Methods:
 - 1.6.3.1 Chronic tests must be conducted bimonthly.
 - 1.6.3.2 Tests (survival and reproduction test) shall be conducted using water fleas, *Ceriodaphnia dubia*.
 - 1.6.3.3 The presence of chronic toxicity shall be estimated as specified in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition (EPA/821-R-02-013, October 2002).
 - 1.6.3.4 Results must be reported in TU_c , where $TU_c = 100/IC_{25}$. See Appendix C for a definition of inhibition concentration 25% (IC_{25}).
- 1.6.4 Quality Assurance

- 1.6.4.1 Toxicity testing on each organism must include the following series of five test dilutions (100%, 50%, 25%, 12.5%, and 6.25%) and a control.
- 1.6.4.2 All quality assurance criteria and statistical analyses used for chronic tests and reference toxicant tests must be according to *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms Fourth Edition* (EPA/821-R-02-013, October 2002). If logistical problems beyond the control of the Permittee prevent the timely delivery of a sample to the laboratory, the Permittee may collect only two samples for WET testing and the acceptable sample holding times can be extended from 36 to 48 hours.
- 1.6.4.3 In addition to those quality assurance measures specified in the methodology, the following quality assurance procedures must be followed:
 - 1.6.4.3.1 If organisms are not cultured in-house, concurrent testing with reference toxicants must be conducted. If organisms are cultured in-house, quarterly reference toxicant testing is sufficient. Reference toxicant tests must be conducted using the same test conditions as the effluent toxicity tests.
 - 1.6.4.3.2 If either of the reference toxicant tests or the effluent tests does not meet all test acceptability criteria, as specified in the test methods manual, the Permittee must re-sample and re-test within 14 days of receipt of the test results.
 - 1.6.4.3.3 Control and dilution water must be receiving water or lab water, as appropriate, as described in the manual. If the dilution water used is different from the culture water, a second control using culture water must also be used. Receiving water may be used as control and dilution water upon notification and approval from DEC. In no case shall water that has not met test acceptability criteria be used for either dilution or control.
- 1.6.5 If the chronic toxicity in effluent exceeds the Maximum Daily Limit, 12.2 TU_c, or the Average Monthly Limit, 9.7 TU_c Permit Parts 1.6.6 and/or 1.6.7 apply.
- 1.6.6 Accelerated Testing
 - 1.6.6.1 If the Permittee demonstrates through an evaluation of facility operations that the cause of the exceedance is known and corrective actions have been implemented, only one accelerated test is necessary and the Permittee would return to normal WET testing frequency. If toxicity exceeding the trigger is detected in this test, then the toxicity reduction evaluation (TRE) requirements in Permit Part 1.6.7 shall apply, or
 - 1.6.6.2 If chronic toxicity is detected above a limit specified in Permit Part 1.6.5 and no initial investigation is conducted or no cause is found then the

Permittee must conduct four more biweekly tests over an eight week period. This accelerated testing must be initiated within two weeks of receipt of the test results that indicate an exceedance.

1.6.6.3 The Permittee must notify DEC of the exceedance in writing within two weeks of receipt of the test results. The notification must include the following information:

- 1.6.6.3.1 A status report on any actions required by the permit, with a schedule for actions not yet completed.
- 1.6.6.3.2 A description of any additional actions the Permittee has taken or will take to investigate and correct the cause(s) of the toxicity.
- 1.6.6.3.3 Where no actions have been taken, a discussion of the reasons for not taking action.

1.6.6.4 If none of the four accelerated tests exceed a limit specified in Permit Part 1.6.5, the Permittee may return to the normal testing frequency. If any of the four tests exceed a limit, then the TRE requirements in Permit Part 1.6.7 shall apply.

1.6.7 Toxicity Reduction Evaluation (TRE) and Toxicity Identification Evaluation (TIE)

1.6.7.1 If a limit specified in Permit Part 1.6.5 is exceeded during accelerated testing under Permit Part 1.6.6, the Permittee must initiate a TRE in accordance with *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations* (EPA/600/2-88/070) within two weeks of the receipt of the test results showing an exceedance. At a minimum, the TRE must include:

- 1.6.7.1.1 Further actions to investigate and identify the cause of toxicity;
- 1.6.7.1.2 Actions the Permittee will take to mitigate the impact of the discharge and to prevent the recurrence of toxicity; and
- 1.6.7.1.3 A schedule for these actions.

1.6.7.2 If a TRE is initiated prior to completion of the accelerated testing, the accelerated testing schedule may be terminated, or used as necessary in performing the TRE. The Permittee may initiate a TIE as part of the TRE process. Any TIE must be performed in accordance with EPA guidance manuals, *Toxicity Identification Evaluation; Characterization of Chronically Toxic Effluents, Phase I* (EPA/600/6-91/005F), *Methods for Aquatic Toxicity Identification Evaluations, Phase II: Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080), and *Methods for Aquatic Toxicity*

Identification Evaluations, Phase III: Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity (EPA-600/R-92/081).

1.6.8 Reporting

- 1.6.8.1 The Permittee shall submit the results of the toxicity tests in TU_c with the DMR for the month in which the results are received. The full toxicity test results report shall be submitted by the end of the month following the month in which the DMR is submitted.
- 1.6.8.2 The Permittee must submit the results of any accelerated testing, under Permit Part 1.6.6, within two weeks of receipt of the results from the lab. The full report must be submitted within four weeks of receipt of the results from the lab. If an initial investigation indicates the source of toxicity and accelerated testing is unnecessary, the result of the investigation must be submitted with the DMR for the month following completion of the investigation.
- 1.6.8.3 The report of toxicity test results must include all relevant information outlined in Section 10, Report Preparation of *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition* (EPA/821-R-02-013, October 2002). In addition to toxicity test results, the Permittee must report: dates of sample collection and initiation of each test; flow rate at the time of sample collection; the results of the monitoring required in Permit Part 1.2; and an explanation of logistical problems described in Permit Part 1.6.4.2, if encountered.

1.7 Annual Water Quality Monitoring Summary

All monitoring results for a year must be included in an Annual Water Monitoring Summary Report and submitted by March 1st of the following year. The report must include a presentation of the analytical results and an evaluation of the results of monitoring required in Parts 1.2 through 1.6. The evaluation must include an electronic spreadsheet containing monitoring data from the previous five years, a graphical presentation of the data at each monitoring station, a comparison of upstream and downstream monitoring results (to show any differences) and a comparison of monitoring results for each station over time (to show any trends). The Annual Report must be certified and signed in accordance with Appendix A, Part 1.12, and it may reference the monthly reports for QA/QC information.

All monitoring results for a calendar year shall be reported in the Report. At a minimum, the report must include the following:

- Dates of sample collection and analyses,
- Results of sample analysis, and
- Relevant QA/QC information.

2.0 SPECIAL CONDITIONS

2.1 Quality Assurance Project Plan

The permittee must develop a quality assurance project plan (QAPP) for all monitoring required by this permit. Within 60 days of the effective date of this permit, the permittee must update the QAPP and submit written notification to DEC that the updated QAPP is being implemented. An existing QAPP may be modified under this section provided that Parts 2.1.1 through 2.1.5 are satisfied.

- 2.1.1 The QAPP must be designed to assist in planning for the collection and analysis of effluent and receiving water samples in support of the permit and to help explain data anomalies whenever they occur.
- 2.1.2 Throughout all sample collection and analysis activities, the permittee must use DEC-approved QA/QC and chain-of-custody procedures, as described in the *Requirements for Quality Assurance Project Plans* (EPA/QA/R-5) and *Guidance for Quality Assurance Project Plans* (EPA/QA/G-5). The QAPP must be prepared in the format which is specified in these documents.
- 2.1.3 The permittee must amend the QAPP whenever there is a modification in sample collection, sample analysis, or other procedure addressed by the QAPP.
- 2.1.4 Copies of the QAPP must be kept on site and made available to DEC upon request.

2.2 Site Management Pollution Prevention Plan

- 2.2.1 Purpose. The permittee shall develop a site management pollution prevention plan (the Plan) to prevent and minimize the potential for the release of pollutants from their property to waters of the U.S. within 60 days of the effective date of this permit. The Plan shall be signed in accordance with Appendix A, Part 1.12. A notice of the Plan's completion and implementation shall be sent to DEC. The Plan shall be retained on-site and be made available to DEC upon request.
- 2.2.2 Development and Implementation Schedule. The Plan shall be consistent with the above objectives and the general guidance contained in the following publications, or any subsequent revision to these guidance documents:
 - Best Management Practices Guidance Document, EPA, 1993.
 - Storm Water Management Plans for Industrial Activities, EPA, 1992.
 - Storm Water Management Plans for Construction Activities, EPA, 1992.
- 2.2.3 The permittee shall establish specific best management practices to meet the objectives and shall address each component or system capable of generating or causing a release of pollutants. Moreover, the Plan shall include, at a minimum, the following items:
 - 2.2.3.1 Pollution Prevention Team. The Plan shall identify a specific individual or individuals within the facility organization as members of the Pollution

Prevention Team. The pollution prevention team shall be responsible for developing the Plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The Plan shall clearly identify who is responsible for the implementation of each condition of the Plan. The activities and responsibilities of the team shall address all aspects of the facility's discharges. In lieu of naming specific individuals as members of the pollution prevention team, the permittee may name the corporate position(s) responsible for developing and implementing the Plan.

2.2.3.2 Description of Sources

- 2.2.3.2.1 A site map indicating an outline of the portions of the drainage area of each point source that are within the facility boundaries, each existing structural control measure to reduce pollutants in storm water runoff, surface waterbodies, locations where significant materials are exposed to precipitation, and the locations (if applicable) of the following activities and sites where such activities or sites are exposed to precipitation: buildings, camps, airport, construction areas, and any disturbed area.
- 2.2.3.2.2 A site map indicating the flow direction of drainage.
- 2.2.3.2.3 For each area that generates storm water discharges associated with industrial activity with a reasonable potential for containing amounts of pollutants, a prediction of the direction of flow, and an identification of the types of pollutants which are likely to be present in storm water discharges associated with industrial activity. Factors to consider include the toxicity of chemical; quantity of chemicals used, produced or discharged; the likelihood of contact with storm water; and history of significant leaks or spills of toxic or hazardous pollutants. Flows with a potential for causing erosion shall be identified.
- 2.2.3.2.4 For each area that generates storm water discharges associated with construction or exploration activities, descriptions of the following components shall be included in the Plan:
 - The nature of the activity,
 - Estimates of the total area of the site and the area of the site that is expected to be disturbed by mining activities or related land-disturbing activities,
 - Existing data describing the soil or the existing data describing the quality of any discharge from the site,
 - A site map indicating drainage patterns and approximate slopes anticipated after land-disturbing activities, areas of soil disturbance, the location of major control structures identified

in the Plan, areas where stabilization practices are expected to occur; and

- The name of the receiving water(s) and the ultimate receiving water(s).

2.2.3.2.5 Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation and the materials that have the potential for failure (tank overflow or leakage). The inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water; method, location, and size of on-site storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff; the location and a description of existing structural and non-structural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

2.2.3.2.6 Spills and Leaks. A list of significant spills that may occur at the site and at areas that are exposed to precipitation or that otherwise drain to a storm water conveyance at the facility. Such list shall be updated as appropriate during the term of the permit.

2.2.3.2.7 Risk Identification and Summary of Potential Pollutant Sources. The Plan shall identify all activities, sites, and significant materials which may potentially be pollutant sources. The Plan shall also include a narrative description of the potential pollutant sources from the following activities: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; dust or particulate generating processes; and on-site waste disposal practices. The description shall specifically list any potential source of pollutants at the site, and for each potential source, any pollutant or pollutant parameter (e.g. biochemical oxygen demand, etc.) of concern shall be identified. The Plan shall provide a description of potential sources which may reasonably be expected to add amounts of pollutants to storm water discharges.

2.2.3.2.8 Measures and Controls. The facility shall develop a description of pollution prevention controls appropriate for the facility and implement such controls. The appropriateness and priorities of controls in the Plan shall reflect identified potential sources of pollutants at the facility. The description of management controls shall address the following minimum components, including a schedule for implementing such controls:

2.2.3.2.8.1 Good Housekeeping - Good housekeeping requires the maintenance of areas which may contribute pollutants.

2.2.3.2.8.2 Preventive Maintenance - A preventive maintenance program shall involve timely inspection and maintenance of storm water management devices (e.g., cleaning oil/water separators, catch basins, pumps, channels, ditch) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

2.2.3.2.8.3 Spill Prevention and Response Procedures - Areas where spills could result in the discharge of pollutants shall be identified clearly in the Plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the Plan should be considered. Procedures for cleaning up spills shall be identified in the Plan and made available to the appropriate personnel. The necessary equipment to implement a cleanup must be available to personnel.

2.2.3.2.8.4 Measures and Controls for storm water associated with construction or exploration activities outside of the area which drains into the tailings impoundment - The Plan shall describe the relationship between the implementation and maintenance of controls and measures and the various stages or phases of earth disturbance (for example, clearing and grubbing necessary for perimeter controls, initiation of perimeter controls, remaining clearing and grubbing, road grading, remaining site grading, storm drain installation, final grading, stabilization, removal of control measures). The description of controls shall address the following minimum components:

- Erosion and sediment controls,
- Stabilization practices,
- Structural practices,
- Storm water management (description of measure to control pollutants in storm water discharges);
- Other controls to eliminate contact of storm water with materials on site; and
- Measures to reduce pollutant loadings.

2.2.3.2.9 Employee Training. The Plan shall identify dates for annual employee training programs. The training programs shall inform personnel responsible for implementing activities identified in the Plan or otherwise responsible for all levels of responsibility of the components and goals of the Plan. Training shall address topics such as spill response, good housekeeping and material management practices.

2.2.3.2.10 Sediment and Erosion Control. The Plan shall identify areas which, due to topography, activities, or other factors, have a high potential for soil erosion, and identify structural, vegetative, and/or stabilization measures to be used to limit erosion.

2.2.3.2.11 Specific Best Management Practices. The Plan shall establish specific best management practices or other measures which ensure that the following specific requirements are met:

2.2.3.2.11.1 Ensure that berms, including any pond walls, ditches, dikes, dams and similar water retention structures shall be constructed in a manner that they reject the passage of unwanted water.

2.2.3.2.11.2 Ensure that measures are taken to assure that pollutant materials removed from the process water and wastewater streams will be retained and not discharged to waters of the United States.

2.2.3.2.11.3 Ensure that all water control devices, including but not limited to structures and berms, and all solids retention structures such as berms, dikes, and pond structures and dams, shall be maintained to continue their effectiveness and to protect from failure.

2.2.3.2.11.4 Ensure that best blasting practices are used in any wet blast holes to minimize the amount of blasting agent that dissolves into the groundwater in the vicinity of the blast hole.

2.2.4 Qualified facility personnel shall conduct routine inspections on a monthly basis on areas susceptible to leaks (including leaks from the tailings impoundment), spills and other identified problem areas.

2.2.4.1 For an inspection, the following conditions shall be met:

2.2.4.1.1 A visual inspection of equipment needed to implement the Plan, such as spill response equipment, shall be made.

2.2.4.1.2 Areas impacted by storm water discharge shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the Plan shall be observed to ensure that they are operating correctly.

- 2.2.4.1.3 The permittee shall inspect disturbed areas of the construction or exploration site exposed to precipitation outside of the area which drains into the tailings impoundment as follows:
 - 2.2.4.1.3.1 Weekly during the months of May, June, September and October; and
 - 2.2.4.1.3.2 Within 24 hours of the end of a 24-hour rain event that is 0.5 inches or greater.
- 2.2.5 Twice per year, the permittee shall 1) identify areas impacted by storm water discharges associated with construction or exploration activities, and 2) evaluate whether measures identified in the Plan to reduce pollutant loadings generated by storm water discharges associated with construction or exploration activities are adequate and properly implemented.
- 2.2.6 Based on the results of the inspections, the permittee shall initiate corrective measures within 30 days of such inspection or as soon as practicable under extenuating circumstances. The permittee shall notify DEC of the extenuating circumstances within 15 days of the inspection. Any corrective measures shall be documented and be included in the Plan.
- 2.2.7 The permittee shall prepare an annual report summarizing the:
 - 2.2.7.1 Scope of the inspections,
 - 2.2.7.2 Personnel making the inspections
 - 2.2.7.3 Dates of the inspections,
 - 2.2.7.4 Corrective actions taken as a result of the inspection,
 - 2.2.7.5 Description of the quality and quantity of storm water discharged,
 - 2.2.7.6 Construction activities during the year,
 - 2.2.7.7 Employee training conducted during the year, and
 - 2.2.7.8 Plan modifications made during the year.

In addition, the report shall identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report shall contain a certification that the facility is in compliance with the Plan and this permit.

This report shall be signed in accordance with Appendix A, Part 1.12 and shall be submitted to DEC by March 1st of the next year.
- 2.2.8 The permittee shall amend the Plan whenever there is a change in design, construction, operation, or maintenance, which has an effect on the potential for the discharge of pollutants to the waters of the United States or if the Plan proves to be ineffective in eliminating or minimizing pollutants from sources impacting water quality, or in otherwise achieving the general objectives of controlling

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

2.3 Electronic Reporting (E-Reporting) Rule

The Permittee is responsible for electronically submitting DMRs and other reports in accordance with 40 CFR §127. The start dates for e-reporting are provided in 40 CFR §127.16. DEC has established a website at <http://dec.alaska.gov/water/Compliance/EReportingRule.htm> that contains general information. As DEC implements the E-Reporting Rule, more information will be posted on this webpage. The permittee will be further notified by DEC in the future about how to implement the conditions in 40 CFR §127.

Figure 1: Red Dog Mine Map

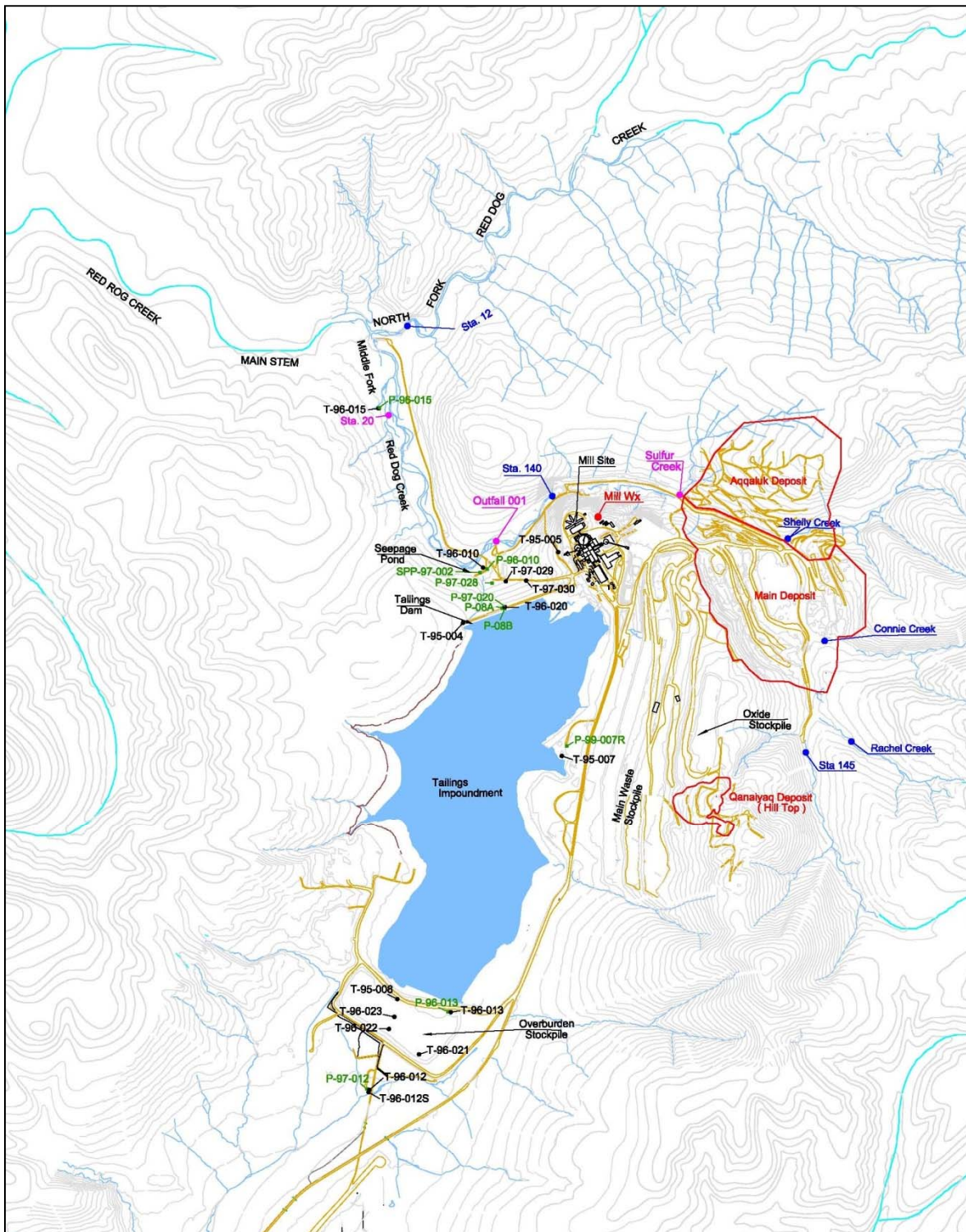


Figure 2: Mixing Zones and Ambient Monitoring Sampling Locations

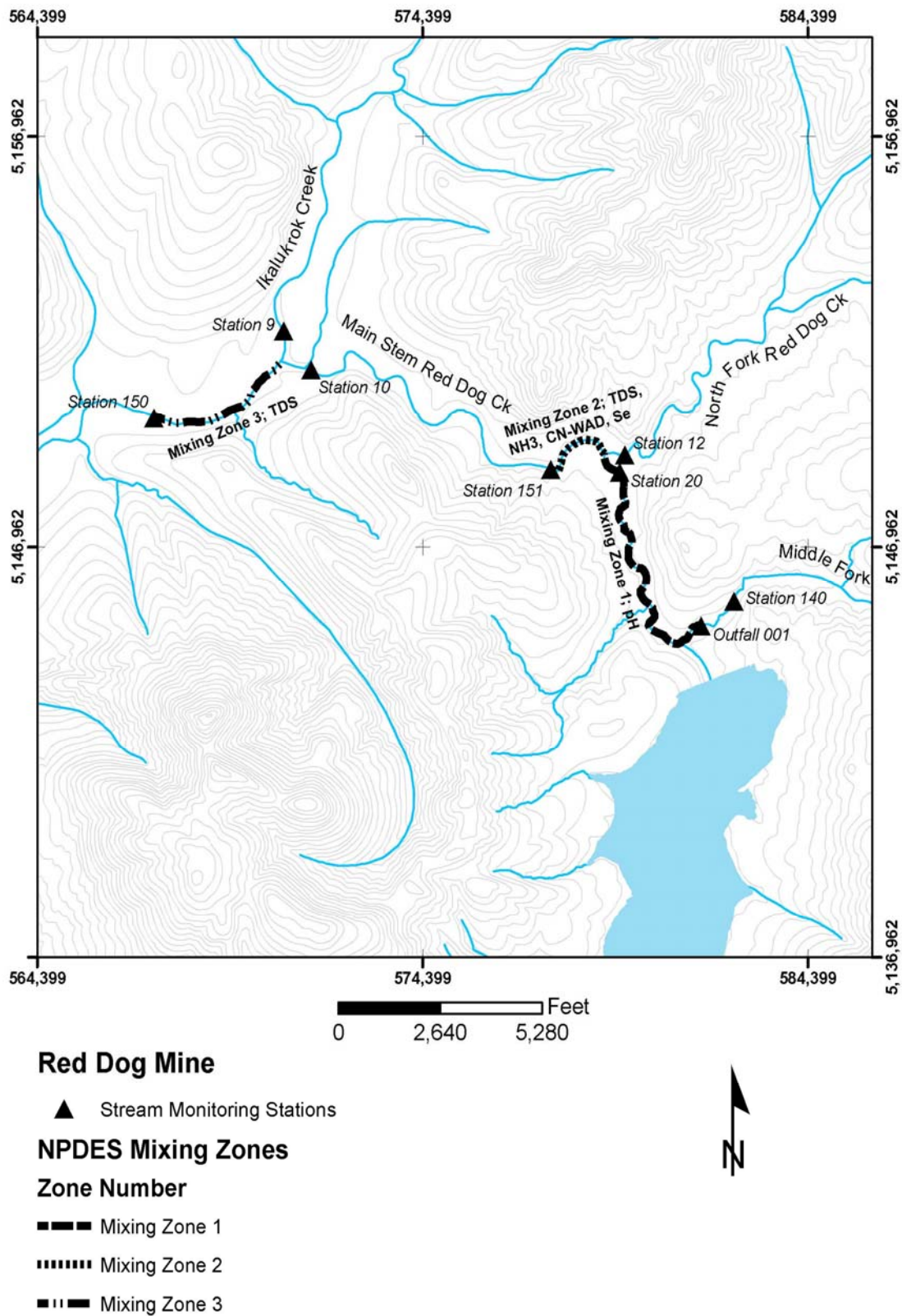


Figure 3: Schematic of Mixing Zones

