

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR PERMITS PROGRAM**

TECHNICAL ANALYSIS REPORT
for
Air Quality Control Minor Permit AQ0290MSS07

Teck Alaska, Inc.
Red Dog Mine

TAILING SUMP EMERGENCY GENERATOR

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Date: Preliminary – February 5, 2010

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ABBREVIATIONS/ACRONYMS

AAC.....	Alaska Administrative Code
ACMP.....	Alaska Coastal Management Program
ADEC.....	Alaska Department of Environmental Conservation
AS.....	Alaska Statutes
C.F.R.....	Code of Federal Regulations
EPA.....	Environmental Protection Agency
ORL.....	Owner Requested Limit
PSD.....	Prevention of Significant Deterioration
PTE.....	Potential to Emit
TAK.....	Teck Alaska Inc.

Units and Measures

kW.....	kiloWatts
lbs.....	pounds
tpy.....	tons per year

Pollutants

CO.....	Carbon Monoxide
HAPS.....	Hazardous Air Pollutants
NO _x	Oxides of Nitrogen
PM-10.....	Particulate Matter with an aerodynamic diameter less than 10 microns
SO ₂	Sulfur Dioxide
VOC.....	Volatile Organic Compound

1.0 Introduction

This Technical Analysis Report (TAR) provides Alaska Department of Environmental Conservation's (Department's) basis for issuing Minor Source Air Quality Control Permit AQ0290MSS07 to Teck Alaska, Inc. (TAK) for installing and operating a Tailings Sump Emergency Generator at Red Dog Mine under 18 AAC 50.508(5). The minor permit application is dated September 29, 2009. In the minor permit, the Department establishes an Owner Requested Limit (ORL) to avoid a minor permit under 18 AAC 50.502(c)(3) for nitrogen oxides (NO_x) by restricting the hours of operation to 500 hours per a 12-month period.

1.1 Stationary Source Description

Red Dog Mine is an existing stationary source classified as a Prevention of Significant Deterioration (PSD) major stationary source and a Hazardous Air Pollutant (HAP) major stationary source.

Red Dog Mine is a self-contained facility located about 90 miles north of Kotzebue containing a power generating system, personnel complexes, storage, incinerators, and an airport. The facility extracts zinc and lead ores in an open-pit mine and processes the ores into powders using crushers and mills. Ores and powders are stored as stockpiles within the facility, and the tailings in ponds.

The emission units include diesel-electric generators, oil-fired heaters, small heaters, incinerators, baghouses, scrubbers, concrete plant, and storage tanks. TAK operates the Red Dog Mine under several construction permits and minor permits (added as the facility expanded), and under a Title V operating permit.

1.2 Application Description

TAK submitted an application under 18 AAC 50.508(5) for an ORL to restrict the hours of operation per 12-month period to 500 hours for a tailings sump emergency generator, to avoid PSD modification under 18 AAC 50.306 and minor permit under TAK's application included all the necessary requirements for an ORL, manufacturer information, and compliance with state emission standards.

TAK is raising the tailings dam at the Red Dog Mine. Once raised, the tailings flow from the mill to the pond will not flow using gravity, but will require pumps to move the tailings. The pumps will normally operate using the facility's main power. However, power failure events require additional measures to prevent the tailings trapped in the pipeline from flowing back into the mill during power failures. TAK plans to use an emergency generator to avoid for such events.

TAK requested a 500 hour per 12-month period for non-emergency use ORL on the tailing sump emergency generator. TAK explains that this ORL prevents the generator's NO_x emissions from exceeding the thresholds under 18 AAC 50.502(c)(3) or 18 AAC 50.306. TAK notes that without this ORL, they would need to submit an application under 18 AAC 50.306 for PSD

major modification. TAK plans to install a non-resettable hour meter, and monitor and record the hours of operation on a monthly basis to demonstrate compliance.

1.3 Emissions Summary and Permit Applicability

Table 1 shows the emission summary and reflects the requested ORL for the tailings sump emergency generator. As shown in the table, this project avoids classification under 18 AAC 50.306 and 18 AAC 50.502(c)(3). Calculation assumptions in **Table 1** include:

- 1) 500 hours per year operation;
- 2) Worst-case vendor data for NO_x, carbon monoxide (CO), particulate matter less than 10 microns (PM-10), and volatile organic compounds (VOC); and
- 3) Mass balance using 0.16% weight sulfur content for sulfur dioxide (SO₂).

Table 1 – Emissions Summary and Permit Applicability, tpy

Parameter	NO _x	CO	SO ₂	PM-10	VOC
Tailings Sump Emergency Generator	2.9	0.3	0.2	0.015	0.0075
Minor Permit Modification Thresholds (18 AAC 50.502(c)(3))	10	N/A	10	10	N/A
18 AAC 50.502(c) Permit Required?	No	No	No	No	No

Table 2 shows the stationary source’s potential emissions with this project, used to calculate assessable emissions. Emission fee requirements are required for a minor permit issued under 18 AAC 50.542, as described in 18 AAC 50.544(a).

Table 2 – New Assessable Emissions, tpy

Parameter	NO _x	CO	SO ₂	PM-10	HAPs ^a	VOC	Total Assessable
AQ0290MSS06 Assessable Emissions	4173	402	265	366	230	162	5,598
Tailing Sump Emergency Generator	3	0	0	0	0.0	0	3
Revised PTE	4176	402	265	366	230	162	5601

Table Notes:

^a HAPs emissions are insignificant for tailings sump emergency generator.

1.4 Department Findings

Based on the review of the application, the Department finds that:

1. The Red Dog Mine is classified as a PSD major stationary source and a HAPs major stationary source.
2. TAK currently operates the Red Dog Mine under Operating Permit AQ0290TVP01, Rev. 2. TAK also operates under several construction and minor permits.
3. This project is classified under 18 AAC 50.508(5) because TAK is requesting an ORL to avoid classification under 18 AAC 50.502(c)(3).
4. The unrestricted NO_x emissions (8,760 hours per year) for the trailing sump generator are 51 tpy. As restricted by the 500 hours non-emergency operation per 12-month period ORL, the emissions increase is less than the minor permit threshold in 18 AAC 50.502(c)(3) (see **Table 1**). As such, the ORL has avoided a minor permitting requirement for NO_x.
5. The applicant used fuel oil sulfur (S) content of 0.16 percent by weight to calculate the SO₂ emissions. However, there is no need to impose a 0.16 percent S content in the permit because even with 0.5 percent S content, the SO₂ emissions are well below one tpy. No fuel S limit is needed to avoid minor permitting for SO₂. The assessable emissions are also negligible with 0.5 sulfur content.
6. TAK's application included analysis to show compliance with the state emission standards. This is a requirement for a project classified under 18 AAC 50.502(c) and the requirements are not needed for this permit.
7. TAK's application for a minor permit for the Red Dog Mine tailings sump emergency generator contains the elements listed in 18 AAC 50.540.
8. Red Dog Mine is located in the Northern coastal district. The project is consistent with the Alaska Coastal Management Program (ACMP) through AS 46.40.040(b)(1). This permit is a minor permit classified under 18 AAC 50.508(5). This classification is not on the ACMP C list, therefore the ACMP project modification and Department single agency review procedures do not apply.

2.0 Permit Requirements

State regulations in 18 AAC 50.544 describe the elements that the Department must include in minor permits. This section of the TAR provides the technical and regulatory basis for the permit requirements in Minor Permit AQ0290MSS07, which is classified under 18 AAC 50.508(5).

2.1 General Requirements for all Minor Permits

This permit includes the following requirements necessary for all minor permits as described in 18 AAC 50.544(a)(1) through (5):

- (1) The cover page identifies the stationary source, the project, the permittee, and contact information;
- (2) Section 2 of the permit contains the requirements to pay emission fees. The Department has rescinded the emissions fees established in AQ0209MSS06 and replaced it with the

new fee requirements in this minor permit. The new fee requirement is equal to the new the assessable emissions shown in Table 2 of 5601 tons;

- (3) This minor permit did not establish conditions under 18 AAC 50.201;
- (4) Section 3 of the permit includes the requirements of an ORL under 18 AAC 50.225 that applies to the stationary source.
- (5) Section 5 of the permit contains the standard permit conditions under 18 AAC 50.345 as applicable for the permit.

2.2 Requirements for a Permit Classified under 18 AAC 50.508(5)

18 AAC 50.544(h) describes the requirements for a permit classified under 18 AAC 50.508(5). This permit describes terms and conditions, including specific testing, monitoring, recordkeeping, and reporting requirements; it lists the equipment covered by the ORL and it describes the classification that the applicant wants to avoid.

2.2.1 ORL to Avoid Project Classification under 18 AAC 50.502(c)(3)

As required in 18 AAC 50.544(h), the minor permit includes the following:

- The terms and conditions, including specific testing, monitoring, recordkeeping, and reporting requirements
- A list of the equipment covered by the ORL
- Description of the classification that the limit allows the applicant to avoid

The minor permit contains the ORL for hours of operation for a 12-month period to avoid classification under 18 AAC 50.502(c)(3). The ORL limits the operation of Emission Unit MG-26 up to 500 hours of non-emergency operation per year. Because the ORL is only for non-emergency operation, the Department has included a requirement to report all emergency operation and the basis for considering it an emergency. There is no hour limit for emergency operation, but the Department will assess whether the operation is emergency when it reviews the operating report.

2.3 Certification and Information Requests

All air quality control permits must contain procedures for information requests and certification, including certification requirements described in 18 AAC 50.544(h)(4). Information request requirements are specifically required under 18 AAC 50.200. Certification requirements are specifically required under 18 AAC 50.205.

3.0 Permit Administration

This permit action is an off permit change because none of the proposed permit terms and conditions are prohibited in the operating permit. Therefore, the Permittee may operate under Minor Permit AQ0290MSS07 upon issuance. The Department intends to incorporate the terms and conditions of Minor Permit AQ0290MSS07 when the operating permit is renewed.