

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

TECHNICAL ANALYSIS REPORT
for
Air Quality Control Minor AQ0406MSS05

Sumitomo Metal Mining Pogo LLC
Pogo Mine

REVISE AQ0406MSS04

Prepared by: Krystin Bablinskas
Supervisor: Zeena Siddeek
Date: Preliminary – August 18, 2010

Table of Contents

1.0	Introduction.....	4
1.1	Stationary Source Description	4
1.2	Application Description	4
1.3	Emissions Summary and Permit Applicability	4
1.4	Department Findings.....	6
2.0	Permit Requirements.....	7
2.1	Changes to Minor Permit AQ0406MSS04	7
3.0	Permit Administration.....	9
	Appendix A: Emission Unit Inventory	10
	Appendix B: Emission Calculations	13

ABBREVIATIONS/ACRONYMS

AAC.....	Alaska Administrative Code
ACMP.....	Alaska Coastal Management Program
ADEC.....	Alaska Department of Environmental Conservation
AS.....	Alaska Statutes
ASTM.....	American Society of Testing and Materials
BAE.....	Baseline Actual Emissions
CEMS.....	Continuous Emission Monitoring System
C.F.R.....	Code of Federal Regulations
EPA.....	Environmental Protection Agency
MACT.....	Maximum Achievable Control Technology
NA.....	Not Applicable
NAICS.....	North American Industry Classification System
NESHAPS.....	National Emission Standards for Hazardous Air Pollutants
NSPS.....	New Source Performance Standards
ORL.....	Owner Requested Limit
PAE.....	Projected Actual Emissions
PS.....	Performance Specification
PSD.....	Prevention of Significant Deterioration
PTE.....	Potential to Emit
RM.....	Reference Method
SIC.....	Standard Industrial Classification
SN.....	Serial Number
TBD.....	To Be Determined

Units and Measures

bhp.....	brake horsepower or boiler horsepower
gr./dscf.....	grains per dry standard cubic feet (1 pound = 7,000 grains)
dscf.....	dry standard cubic foot
gph.....	gallons per hour
kW.....	kiloWatts
kW-e.....	kiloWatts electric ¹
lbs.....	pounds
mmBtu.....	million British thermal units
ppm.....	parts per million
ppmv.....	parts per million by volume
tph.....	tons per hour
tpy.....	tons per year
wt%.....	weight percent

Pollutants

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

¹ kW-e refers to rated generator electrical output rather than engine output

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 AQ0406MSS05 to Sumitomo Metal Mining Pogo LLC (Sumitomo) for the Pogo Mine under 18 AAC 50.508(6). The minor permit application is dated July 1, 2010. In the minor permit, the Department revises conditions of Minor Permit AQ0406MSS04. AQ0406MSS05 rescinds and replaces Minor Permit AQ0406MSS04.

1.1 Stationary Source Description

The Pogo Mine is an underground mine located in interior Alaska, about 40 miles northeast of Delta Junction. In February 2006, the construction phase was completed. Sumitomo acquired the mine from Teck Alaska, Inc. and now operates the mine in its operation phase.

The Department has issued several permits pertaining to the Pogo Mine throughout the construction and operation of the facility. The TARs from AQ0406MSS01, AQ0406MSS02, AQ0406MSS03, and AQ0406MSS04 provide the technical and regulatory basis for the provisions established in those permits and included in this minor permit.

1.2 Application Description

Sumitomo submitted an application under 18 AAC 50.508(6) to revise or rescind conditions of Minor Permit AQ0406MSS04. Sumitomo requested the following changes:

- 1) Install a new generator set and a new compressor engine, designated as emission units (EUs) 220 and 221, respectively, and update the permit to include EUs 220 and 221 as part of the 185,000 gallon per year (gal/yr) owner requested limit (ORL).
- 2) Install a new set of heaters, designated as EU 418 and update the permit accordingly.
- 3) Establish a new sulfur limit for diesel fuel to maintain Title V avoidance.
- 4) Remove permit conditions that no longer applicable or are no longer needed.
- 5) Update the emission unit inventory, including
 - a. removing emission units that are no longer present at Pogo Mine;
 - b. updating existing emission units to reflect current capacity;
 - c. adding new emission units; and
 - d. removing units that do not have applicable permit requirements.

1.3 Emissions Summary and Permit Applicability

Table 1 shows the emission summary with permit applicability for a Title V Operating Permit. For permit applicability, fugitive emissions and emissions from explosions and non-road engines are not included. A complete emission unit inventory with calculations and assumptions can be found in Appendix B: Emission Calculations.

Table 1: Emissions Summary and Permit Applicability (tpy)

Pollutant	AQ0406MSS05	AQ0406MSS04	Change in PTE	Title V Threshold	Title V Permit Required?
NOx	92.8	98.1	-5.3	100	No
CO	39.1	38.8	0.3	100	No
PM-10	43.6	46.6	-3.0	100	No
VOC	35.8	40.7	-4.9	100	No
SO ₂	87.1	95.4	-8.3	100	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). Note that the Department did not include the emissions from the explosives (EU 302) as part of the stationary source emissions or PTE, though they are included as assessable emissions. EPA’s AP-42 has theoretical tables showing emission factors for various types of explosives. Sumitomo did not specify the type of explosives used at Pogo Mine and thus used the worst-case emission factors from various types of explosives. Not all explosives produce emissions for each pollutant. Therefore, because these emissions are difficult to quantify, the Department treated this as non-stationary emission units for the PTE and permit applicability.

Table 2: Assessable Emissions (tpy)

Pollutant	Stationary Emission Units	Explosives (Fugitive)	Fugitive PM Emission Units	Assessable Emissions
NOx	92.8	11.1	0	103.9
CO	39.1	43.7	0	82.8
PM-10	43.6	9.5	21.7 ^a	74.8
VOC	35.8	0	0	35.8
SO ₂	87.1	1.3	0	88.4
Total Assessable				385.8

^a made up of 7.7 tpy of fugitive emissions from the portable crusher and various fugitive emissions of 14 tpy. See TAR of AQ0406MSS04.

1.4 Department Findings

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

1. Pogo Mine is classified as a minor source. The emissions from Pogo Mine do not exceed the Title V thresholds under 18 AAC 50.326 or the Prevention of Significant Deterioration thresholds under 18 AAC 50.306.
2. This project is classified under 18 AAC 50.508(6) because Sumitomo is requesting to revise or rescind conditions of Minor Permit AQ0406MSS04.
3. The Pogo Mine’s emissions (excluding fugitives) with the changes to the inventory do not exceed the threshold of 100 tpy for each regulated pollutant. Therefore, Sumitomo is not required to obtain a Title V Operating Permit.
4. Sumitomo requested that the new engines (EUs 220 and 221) be subject to the ORL of 185,000 gal/yr. This ORL includes three existing engines (EUs 208 – 210) that were included in an ambient demonstration in Minor Permit AQ0406MSS04. Because the

existing units have worst-case emission factors and the new units are included in the ORL, the Department is not requesting a revised ambient demonstration.

5. The new units (EUs 418, 220, and 221) are fuel burning equipment subject to the state standards for visible emissions under 18 AAC 50.055(a)(1), PM emissions under 18 AAC 50.055(b)(1), and SO₂ emissions under 18 AAC 50.055(c)(1).
6. As revised in the minor permit, the assessable emissions for the Pogo Mine are 386 tpy as shown in Table 2.
7. Sumitomo’s application for a minor permit for Pogo Mine contains the elements listed in 18 AAC 50.540.
8. Pogo Mine is not located in a coastal district. Therefore, this permit action is not subject to the consistency review with the Alaska Coastal Management Program.

2.0 Permit Requirements

This section of the TAR provides the technical and regulatory basis for the permit requirements in Minor Permit AQ0406MSS05, which is classified under 18 AAC 50.508(6).

2.1 Changes to Minor Permit AQ0406MSS04

The minor permit reflects the following revisions as requested by the Permittee. For continuity, the Department also revised other conditions not specifically requested by the Permittee.

Revisions include the following:

- Updated emission unit inventory and moved inventory from the appendix into Section 1 of the minor permit. Updates are noted in the revised inventory found in Appendix A: Emission Unit Inventory.
- To reflect the changes in the emission unit inventory
 - all units removed from site (EUs 103, 117, 410, 516, 530, 531, ELAB) have been removed from the general requirements, state requirements, and applicant-requested permit conditions;
 - new units (EUs 220, 221, and 418) have been added to general requirements, state requirements, and applicant-requested permit conditions including
 - 185,000 gal/yr fuel limit to avoid Title V. This condition now contains EUs 220 and 221 as part of the condition;
 - The *SO₂ Limit* condition has EUs 220, 221, and 418 as part of the condition; and
 - The *Specific Requirements to Protect the NO₂ Increment* also has EUs 220 and 221 added to the condition for continuity. The new emission units have lower emission rates than the modeled units. By adding these engines under the same 185,000 gal/yr restriction, the modeled units must operate less than previously modeled to include the new units. The Department notes that this will not cause an adverse impact on the increment and does not require a revision of the model to verify.

- Deleted the *General Requirements* conditions to label emission units and provide specification sheets to the Department. There is no regulatory basis for this condition.
- Deleted the non-road engines (EUs 412 and 413) from the inventory and deleted the condition to record information for the non-road engines. The Department noted that these non-road engines do not have ambient restrictions and therefore do not need a condition to record information about the engines.
 - The Department also deleted the requirement to track the location of Unit CP, the portable crusher. The original construction permit application (AQ0406CPT01) contains an ambient impact showing that the impacts of fugitive emissions from the portable crusher are insignificant. Additionally, Unit CP is subject to the state emission standards and fugitive dust standards to ensure that emissions are properly controlled.
- Deleted the *Emission Unit Inventory During Operation* condition. This condition was left over from previous permits while Pogo Mine was still under construction. Pogo Mine is now in full operation.
- Deleted all references to using used oil in EU 110. Sumitomo notes that they no longer intend to fire used oil and instead will use diesel. The Department removed conditions pertaining to PM state emission standards and SO₂ Limits. The Department also removed references to used oil for EU 110 and the additional mr&r requirements.
- Changed fuel sulfur limit from 0.4 percent by weight to 0.3 percent by weight under the *Sulfur Compound Emissions Condition* and *SO₂ Limit* condition. The *SO₂ Limit* condition is referenced under the *SO₂ Standards and Increments* condition. Because this revision will result in lower SO₂ emissions, there is no reason to perform a revised ambient assessment.
- Added EUs 542 – 545 to the 3 MMgal/yr fuel limit under *Fuel Limit for Emission Units 414 and 415* condition and updated the *Specific Requirements to Protect the NO₂ Increment* condition for continuity. The Permittee noted in their application, that propane from the propane vaporizers (EUs 542 – 545) feeds the heaters (EUs 414 and 415) limited by this condition. The Department notes that this results in a drop in PTE for all pollutants for the propane vaporizers. Because this of this drop, the Department does not predict an adverse impact on the NO₂ increment and is not requiring a revised ambient assessment.
- Under *General Ambient Air Requirements* condition, the Department removed the reference to build the stationary source according to the 2003 application. Sumitomo notes that the mine is no longer in its construction phase and is now in full operation. Therefore, conditions relating to construction of Pogo Mine are no longer necessary.
- Under *General Ambient Air Requirements* and *Fugitive Dust Requirements* conditions the Department updated the requirement to spray dust controls after blasting or using dust-producing equipment to require the Permittee to use spray controls when dust is observed under the Dust/No Dust plan.
 - Sumitomo originally requested that these conditions be removed due to the naturally wet conditions at the mine. However, the Department determined that

these conditions require an ambient demonstration before removal. Instead, the Department updated the conditions to allow Sumitomo to only use control measures when dust is observed.

- The Department also made formatting, spelling, and other editorial revisions throughout the permit as warranted.

Sumitomo submitted several requests for permit revisions that the Department did not grant. The requested revisions and reason for denying the requests are listed below:

- Removal of EUs 534A – 534J and 535 – 539 from emission unit inventory. Sumitomo requested to remove these emission units from the inventory since they do not have specific permit conditions associated with them. The Department notes that unrevised conditions exist and has elected to keep these units in the inventory.
- Remove explosives (EU 302) from the state standards for visible emissions, PM, and SO₂. 18 AAC 50.990(49) defines “industrial process” as the extraction of raw material or the physical or chemical transformation of raw material in either composition or character. Extraction of raw material requires the use of explosives in some cases and is thus an industrial process subject to the state standards. The Department did not remove references from the state standards or the *Fugitive Dust Requirements* condition.

3.0 Permit Administration

Sumitomo may operate under minor permit AQ0406MSS05 upon issuance.

Appendix A: Emission Unit Inventory

Table A-1 below shows the updated Emission Unit Inventory for Pogo Mine. Strikethrough text shows updates to the emission unit inventory. This includes changes in unit type, description, rated capacity, and/or fuel. Italicized text represents new units.

Table A-1: Revised Emission Unit Inventory

ID	Type	Description	Rated Capacity	Fuel	Max. Operation
102	Various Heaters	Lower Camp Construction Camp	0.6 MMBtu/hr 2.0 MMBtu/hr	Propane	8,760 hr/hr
104	Various Heaters	Water Treatment Plant	3.2 MMBtu/hr	Diesel	8,760 hr/yr
106	Various Heaters	Mill Building	17.9 MMBtu/hr 14.8 MMBtu/hr	Diesel	8,760 hr/yr
107	Various Heaters	Filter/Backfill Plant	6.8 MMBtu/hr 4.0 MMBtu/hr	Diesel	8,760 hr/yr
108	Various Heaters	Permanent Camp	11.4 MMBtu/hr 9.2 MMBtu/hr	Diesel	8,760 hr/yr
110	Various Heaters	Truck Shop Complex	6.3 MMBtu/hr 8.2 MMBtu/hr	Diesel	8,760 hr/yr
111	Heater	Sewage Treatment Plant	1.7 MMBtu/hr	Diesel	8,760 hr/hr
112	Heater	Environmental Field Office First Aid Building	0.075 MMBtu/hr	Diesel	8,760 hr/yr
113	Heater	Portable Water Treatment	0.04 MMBtu/hr	Diesel	8,760 hr/yr
114	Various Heaters	Redpath Construction Offices Lower Construction Offices	0.3 MMBtu/hr	Diesel	8,760 hr/yr
116	Various Heaters	Lower Warehouse Warehouse	1.3 MMBtu/hr 0.9 MMBtu/hr	Diesel	8,760 hr/yr
118	Various Heaters	1875 Portal Shop	0.368 MMBtu/hr	Diesel	8,760 hr/yr
119	Various Heaters	Mill Bench Maintenance Office Mill Bench, Construction Office	0.76 MMBtu/hr	Diesel	8,760 hr/yr
208	Cummins QSXT15-G9 Generator	Mill Bench Bank Unit No. 1	70.8 gal/MW-hr	Diesel	185,000 gal/yr
209	Cummins QST30-G5 Generator	Mill Bench Bank Unit No. 2	70.8 gal/MW-hr	Diesel	
210	Cummins QST30-G5 Generator	Mill Bench Bank Unit No. 3	70.8 gal/MW-hr	Diesel	
220	<i>CAT 3516C Engine</i>	<i>Lower Camp</i>	<i>69.6 gal/MW-hr</i>	<i>Diesel</i>	
221	<i>CAT C15 Engine</i>	<i>Lower Camp</i>	<i>81.7 gal/MW-hr</i>	<i>Diesel</i>	
218	Fi-Fi Pump Engine	Permanent Fire Water Pump Building	165 bhp	Diesel	200 hr/yr
302	Explosives (Underground)	Exhaust from 1690 Portal	7,150 lb/day	N/A	365 days/yr
410 ^a	Incinerator	Construction Camp	130 lb/hr	Solid Waste	745 tpy
411	Incinerator	Permanent Camp	170 lb/hr	Solid Waste	745 tpy
412 ^b	Light Plant	Light Plant No. 1	180 kW	Diesel	8,760 hr/yr
413 ^b	Light Plant	Light Plant No. 2	15 kW	Diesel	8,760 hr/yr
414	Heater	1525 Mine Air Heater	42.2 MMBtu/hr	Propane	3 MMgal/yr

				LPG	
415	Heater	1876 Mine Air Heater	42.2 MMBtu/hr	Propane LPG	
542 ^c	Propane Vaporizer	1875 Portal	1.0 MMBtu/hr	Propane	
543 ^c	Propane Vaporizer	1875 Portal	1.0 MMBtu/hr	Propane	
544 ^c	Propane Vaporizer	1520 Portal	1.0 MMBtu/hr	Propane	
545 ^c	Propane Vaporizer	1525 Portal	1.0 MMBtu/hr	Propane	
416	Heater	Portable Indirect Fired Heater	1.0 MMBtu/hr	Diesel	8,760 hr/yr
	Isuzu 3LD1	Blower Engine	19 bhp	Diesel	8,760 hr/yr
417	Heater	Portable Indirect Fired Heater	1.0 MMBtu/hr	Diesel	8,760 hr/yr
	Isuzu 3LD1	Blower Engine	19 bhp	Diesel	8,760 hr/yr
418	Six Heaters	Six Portable Indirect Fired Heaters	6.0 MMBtu/hr	Diesel	8,760 hr/yr
516 ^a	Material Transfer	Aboveground Concrete Batch Plant	10 tpd	N/A	8,760 hr/yr
517—525 ^b	Material Transfer	Various	Various	N/A	8,760 hr/yr
528	Baghouse	Underground Apron Feeder No. 1	2,500 cfm	N/A	8,760 hr/yr
530 ^a	N/A	Aboveground 1875 Development FEL to Truck	2,822 tpd	N/A	8,760 hr/yr
531 ^a	N/A	Aboveground 1875 Truck to Drystack	2,822 cfm	N/A	8,760 hr/yr
532	Baghouse	Backfill Plant Cement Silo	750 cfm	N/A	8,760 hr/yr
532A	Baghouse	Cement Screw Conveyor	3,000 cfm	N/A	8,760 hr/yr
533	Baghouse	Conveyor to Surface Coarse Ore Bin/Above Ground	1,500 cfm	N/A	8,760 hr/yr
534	Baghouse	Surface Coarse Ore Bin Apron Feeder/Above Ground	5,000 cfm	N/A	8,760 hr/yr
534A	Bin	Surface Coarse Ore Bin	1,000 tph	N/A	8,760 hr/yr
534B	Conveyor	Conveyor to SAG Mill/Above Ground	150 tph	N/A	8,760 hr/yr
534C	Screen	Gravity Feed Screens (two)	500 tph	N/A	8,760 hr/yr
534D	Screen	Trash Screen	15 tph	N/A	8,760 hr/yr
534E	Screen	Safety Screen	15 tph	N/A	8,760 hr/yr
534F	Tank Exhaust	Electrowinning cell	4,500 cfm	N/A	8,760 hr/yr
534G	Tank Exhaust	Acid Wash Tank	500 cfm	N/A	8,760 hr/yr
534H	Tank Exhaust	Reagent Tank	1,750 cfm	N/A	8,760 hr/yr
534I	Tank Exhaust	Liming and Mixing Tank	500 cfm	N/A	8,760 hr/yr
534J	Tank Exhaust	Cyanide Mixing and Holding Tank	750 cfm	N/A	8,760 hr/yr
535	Roads	Haul Truck-BF Plant to Drystack	N/A	N/A	8,760 hr/yr
536	Roads	Haul Truck-Waste Stockpile to Drystack	N/A	N/A	8,760 hr/yr
537	Roads	Misc. Pickup Truck Trips	N/A	N/A	8,760 hr/yr
538	Roads	Misc. Cargo Truck Trips	N/A	N/A	8,760 hr/yr
539	Roads	Misc. Bus Trips	N/A	N/A	8,760 hr/yr
540	Ducon Venture Packed	Smelting Furnace	2,500 cfm	N/A	8,760 hr/yr

	Tower Scrubber				
541	Lochhead-Haggerty Scrubber	Electric Carbon Kiln	800 cfm	N/A	8,760 hr/yr
ALAB	Baghouse	Assay Lab	8,500 cfm	N/A	8,760 hr/yr
ALAB2	Scrubber	Assay Lab	4,000 cfm 3,000 cfm	N/A	8,760 hr/yr
ALAB3	Scrubber	Assay Lab	1,000 cfm 800 cfm	N/A	8,760 hr/yr
ALAB4	Baghouse	Assay Lab	10,000 cfm	N/A	8,760 hr/yr
ELAB^a	Scrubber	Environmental Lab	1,200 cfm	N/A	8,760 hr/yr
CP	Portable Crusher	Portable Crusher	125 tph	N/A	8,760 hr/yr
CG	Cement Guppies	Cement Guppies	22 tpd	N/A	365 days/yr
AST-01— AST-49^d	Storage Tanks	Various	Various	Diesel/Used Oil/Jet A	N/A
LPG-01— LPG-12^d	Storage Tanks	Various	Various	Diesel/Propane	N/A

^a Emission Unit permanently removed from site.

^b Permit condition changed to exclude this unit.

^c Units added to ORL.

Appendix B: Emission Calculations

Table B-1: Potential NO_x Emissions Calculations

ID	Type	Description	Emission Factor	Source	Rated Capacity	Max. Operation	NO _x Emissions
102	Various Heaters	Lower Camp	0.1421 lb/MMBtu ^a	Table 1.5-1, AP-42	0.6 MMBtu/hr	8,760 hr/yr	0.3 tpy
104	Various Heaters	Water Treatment Plant	20 lb/1,000 gal	Table 1.3-1, AP-42	3.2 MMBtu/hr	8,760 hr/yr	2.0 tpy
106	Various Heaters	Mill Building	20 lb/1,000 gal	Table 1.3-1, AP-42	17.9 MMBtu/hr	8,760 hr/yr	11.4 tpy
107	Various Heaters	Filter/Backfill Plant	20 lb/1,000 gal	Table 1.3-1, AP-42	6.8 MMBtu/hr	8,760 hr/yr	4.3 tpy
108	Various Heaters	Permanent Camp	20 lb/1,000 gal	Table 1.3-1, AP-42	11.4 MMBtu/hr	8,760 hr/yr	7.3 tpy
110	Various Heaters	Truck Shop Complex	20 lb/1,000 gal	Table 1.3-1, AP-42	6.3 MMBtu/hr	8,760 hr/yr	4.0 tpy
111	Heater	Sewage Treatment Plant	20 lb/1,000 gal	Table 1.3-1, AP-42	1.7 MMBtu/hr	8,760 hr/yr	1.1 tpy
112	Heater	Environmental Field Office	20 lb/1,000 gal	Table 1.3-1, AP-42	0.075 MMBtu/hr	8,760 hr/yr	0.048 tpy
113	Heater	Potable Water Treatment	20 lb/1,000 gal	Table 1.3-1, AP-42	0.04 MMBtu/hr	8,760 hr/yr	0.03 tpy
114	Various Heaters	Redpath Construction Offices	20 lb/1,000 gal	Table 1.3-1, AP-42	0.3 MMBtu/hr	8,760 hr/yr	0.2 tpy
116	Various Heaters	Lower Warehouse	20 lb/1,000 gal	Table 1.3-1, AP-42	1.3 MMBtu/hr	8,760 hr/yr	0.8 tpy
118	Various Heaters	1875 Portal Shop	20 lb/1,000 gal	Table 1.3-1, AP-42	1.1 MMBtu/hr	8,760 hr/yr	0.7 tpy
119	Various Heaters	Mill Bench Maintenance Office	20 lb/1,000 gal	Table 1.3-1, AP-42	0.9 MMBtu/hr	8,760 hr/yr	0.6 tpy
208	Cummins QSX15-G9	Mill Bench Bank Unit No. 1	10.004 kg/MW-hr	Vendor	70.8 gal/MW-hr	185,000 gal/yr ^b	28.8 tpy
209	Cummins QST30-G5	Mill Bench Bank Unit No. 2	10.004 kg/MW-hr	Vendor	70.8 gal/MW-hr		
210	Cummins QST30-G5	Mill Bench Bank Unit No. 3	10.004 kg/MW-hr	Vendor	70.8 gal/MW-hr		
220	CAT 3516C Engine	Lower Camp	6.6 kg/MW-hr	Vendor	69.6 gal/MW-hr		
221	CAT C15 Engine	Lower Camp	4.48 kg/MW-hr	Vendor	81.7 gal/MW-hr		
218	Fi-Fi Pump Engine	Permanent Fire Water Pump Building	0.031 lb/hp-hr	Table 3.3-1, AP-42	165 hp	200 hr/yr	0.5 tpy
302	Explosives (underground)	Exhaust from 1690 Portal	17 lb/ton	Table 13.3-1, AP-42	7,150 lb/day	365 day/yr	11.1 tpy
411	Incinerator	Permanent Camp Incinerator	2 lb/ton	Table 2-1.12, AP-42	170 lb/hr	745 ton/yr	0.7 tpy
414	Heater	1525 Mine Air Heater	13 lb/1,000 gal ^a	Table 1.5-1, AP-42	42.2 MMBtu/hr	3 MMgal/yr ^c	19.5 tpy
415	Heater	1875 Mine Air Heater	13 lb/1,000 gal ^a	Table 1.5-1, AP-42	42.2 MMBtu/hr		
542	Propane Vaporizer	1875 Portal	13 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
543	Propane Vaporizer	1875 Portal	13 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
544	Propane Vaporizer	1520 Portal	13 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
545	Propane Vaporizer	1525 Portal	13 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
416	Heater	Portable Indirect Fired Heater	20 lb/1,000 gal	Table 1.3-1, AP-42	1.0 MMBtu/hr	8,760 hr/yr	0.6 tpy
	Isuzu 3LD1	Blower Engine	0.031 lb/hp-hr	Table 3.3-1, AP-42	19.0 bhp	8,760 hr/yr	2.6 tpy
417	Heater	Portable Indirect Fired Heater	20 lb/1,000 gal	Table 1.3-1, AP-42	1.0 MMBtu/hr	8,760 hr/yr	0.6 tpy

	Isuzu 3LD1	Blower Engine	0.031 lb/hp-hr	Table 3.3-1, AP-42	19.0 bhp	8,760 hr/yr	2.6 tpy
418	Six Heaters	Six Portable Indirect Fired Heaters	20 lb/1,000 gal	Table 1.3-1, AP-42	6.0 MMBtu/hr	8,760 hr/yr	3.8 tpy
Total NO_x Emission, Stationary Emission Units (All EUs except EU 302)							92.8 tpy
Total NO_x Emission, Explosive Emission Units (EU 302)							11.1 tpy
Total NO_x Emission, All Emission Units							103.9 tpy

^a Emission factors revised for EU 102 from 0.135 lb/MMBtu, EUs 414-415 from 0.208 lb/MMBtu, and EUs 542-545 from 0.153 lb/MMBtu.

^b ORL now includes EUs 220 and 221 in calculation using worst-case emission factors.

^c ORL now includes EUs 542 – 545 in calculation using worst-case emission factors.

Table B-2: Potential CO Emissions Calculations

ID	Type	Description	Emission Factor	Source	Rated Capacity	Max Operation	CO Emissions
102	Various Heaters	Lower Camp	0.082 lb/MMBtu ^a	Table 1.5-1, AP-42	0.6 MMBtu/hr	8,760 hr/yr	0.2 tpy
104	Various Heaters	Water Treatment Plant	5 lb/1,000 gal	Table 1.3-1, AP-42	3.2 MMBtu/hr	8,760 hr/yr	0.5 tpy
106	Various Heaters	Mill Building	5 lb/1,000 gal	Table 1.3-1, AP-42	17.9 MMBtu/hr	8,760 hr/yr	2.9 tpy
107	Various Heaters	Filter/Backfill Plant	5 lb/1,000 gal	Table 1.3-1, AP-42	6.8 MMBtu/hr	8,760 hr/yr	1.1 tpy
108	Various Heaters	Permanent Camp	5 lb/1,000 gal	Table 1.3-1, AP-42	11.4 MMBtu/hr	8,760 hr/yr	1.8 tpy
110	Various Heaters	Truck Shop Complex	5 lb/1,000 gal	Table 1.3-1, AP-42	6.3 MMBtu/hr	8,760 hr/yr	1.0 tpy
111	Heater	Sewage Treatment Plant	5 lb/1,000 gal	Table 1.3-1, AP-42	1.7 MMBtu/hr	8,760 hr/yr	0.3 tpy
112	Heater	Environmental Field Office	5 lb/1,000 gal	Table 1.3-1, AP-42	0.075 MMBtu/hr	8,760 hr/yr	0.012 tpy
113	Heater	Potable Water Treatment	5 lb/1,000 gal	Table 1.3-1, AP-42	0.04 MMBtu/hr	8,760 hr/yr	0.01 tpy
114	Various Heaters	Redpath Construction Offices	5 lb/1,000 gal	Table 1.3-1, AP-42	0.3 MMBtu/hr	8,760 hr/yr	0.1 tpy
116	Various Heaters	Lower Warehouse	5 lb/1,000 gal	Table 1.3-1, AP-42	1.3 MMBtu/hr	8,760 hr/yr	0.2 tpy
118	Various Heaters	1875 Portal Shop	5 lb/1,000 gal	Table 1.3-1, AP-42	0.368 MMBtu/hr	8,760 hr/yr	0.1 tpy
119	Various Heaters	Mill Bench Maintenance Office	5 lb/1,000 gal	Table 1.3-1, AP-42	0.76 MMBtu/hr	8,760 hr/yr	0.1 tpy
208	Cummins QSX15-G9	Mill Bench Bank Unit No. 1	3.344 kg/MW-hr	Table 3.4.1, AP-42	70.8 gal/MW-hr	185,000 gal/yr ^b	9.6 tpy
209	Cummins QST30-G5	Mill Bench Bank Unit No. 2	3.344 kg/MW-hr	Table 3.4.1, AP-42	70.8 gal/MW-hr		
210	Cummins QST30-G5	Mill Bench Bank Unit No. 3	3.344 kg/MW-hr	Table 3.4.1, AP-42	70.8 gal/MW-hr		
220	CAT 3516C Engine	Lower Camp	0.3618 kg/MW-hr	Vendor	69.6 gal/MW-hr		
221	CAT C15 Engine	Lower Camp	0.7102 kg/MW-hr	Vendor	81.7 gal/MW-hr		
218	Fi-Fi Pump Engine	Permanent Fire Water Pump Building	0.0067 lb/hp-hr	Table 3.3-1, AP-42	165 hp	200 hr/yr	0.1 tpy
302	Explosives (underground)	Exhaust from 1690 Portal	67 lb/ton	Table 13.3-1, AP-42	7,150 lb/day	365 day/yr	43.7 tpy
411	Incinerator	Permanent Camp Incinerator	20 lb/ton	Table 2-1.12, AP-42	170 lb/hr	745 ton/yr	7.4 tpy
414	Heater	1525 Mine Air Heater	7.5 lb/1,000 gal ^d	Table 1.5-1, AP-42	42.2 MMBtu/hr	3 MMgal/yr ^c	11.3 tpy
415	Heater	1875 Mine Air Heater	7.5 lb/1,000 gal ^d	Table 1.5-1, AP-42	42.2 MMBtu/hr		
542	Propane Vaporizer	1875 Portal	7.5 lb/1,000 gal ^d	Table 1.5-1, AP-42	1.0 MMBtu/hr		
543	Propane Vaporizer	1875 Portal	7.5 lb/1,000 gal ^d	Table 1.5-1, AP-42	1.0 MMBtu/hr		
544	Propane Vaporizer	1520 Portal	7.5 lb/1,000 gal ^d	Table 1.5-1, AP-42	1.0 MMBtu/hr		
545	Propane Vaporizer	1525 Portal	7.5 lb/1,000 gal ^d	Table 1.5-1, AP-42	1.0 MMBtu/hr		
416	Heater	Portable Indirect Fired Heater	5 lb/1,000 gal	Table 1.3-1, AP-42	1.0 MMBtu/hr	8,760 hr/yr	0.2 tpy
	Isuzu 3LD1	Blower Engine	0.0067 lb/hp-hr	Table 3.3-1, AP-42	19.0 bhp	8,760 hr/yr	0.6 tpy
417	Heater	Portable Indirect Fired Heater	5 lb/1,000 gal	Table 1.3-1, AP-42	1.0 MMBtu/hr	8,760 hr/yr	0.2 tpy
	Isuzu 3LD1	Blower Engine	0.0067 lb/hp-hr	Table 3.3-1, AP-42	19.0 bhp	8,760 hr/yr	0.6 tpy
418	Six Heaters	Six Portable Indirect Fired Heaters	5 lb/1,000 gal	Table 1.3-1, AP-42	6.0 MMBtu/hr	8,760 hr/yr	1.0 tpy
Total CO Emission, Stationary Emission Units (All EUs except EU 302)							39.1 tpy
Total CO Emission, Explosive Emission Units (EU 302)							43.7 tpy

Total CO Emission, All Emission Units	82.8 tpy
--	-----------------

^a Emission factors revised for EU 102 from 0.0203 lb/MMBtu, EUs 414-415 from 0.035 lb/MMBtu, and EUs 542-545 from 0.0208 lb/MMBtu.

^b ORL now includes EUs 220 and 221 in calculation using worst-case emission factors.

^c ORL now includes EUs 542 – 545 in calculation using worst-case emission factors.

Table B-3: Potential PM-10 Emissions Calculations

ID	Type	Description	Emission Factor	Source	Rated Capacity	Max Operation	CO Emissions
102	Various Heaters	Lower Camp	0.0022 lb/MMBtu ^a	Table 1.5-1, AP-42	0.6 MMBtu/hr	8,760 hr/yr	0.0 tpy
104	Various Heaters	Water Treatment Plant	2 lb/1,000 gal	Table 1.3-1, AP-42	3.2 MMBtu/hr	8,760 hr/yr	0.2 tpy
106	Various Heaters	Mill Building	2 lb/1,000 gal	Table 1.3-1, AP-42	17.9 MMBtu/hr	8,760 hr/yr	1.1 tpy
107	Various Heaters	Filter/Backfill Plant	2 lb/1,000 gal	Table 1.3-1, AP-42	6.8 MMBtu/hr	8,760 hr/yr	0.4 tpy
108	Various Heaters	Permanent Camp	2 lb/1,000 gal	Table 1.3-1, AP-42	11.4 MMBtu/hr	8,760 hr/yr	0.7 tpy
110	Various Heaters	Truck Shop Complex	2 lb/1,000 gal	Table 1.3-1, AP-42	6.3 MMBtu/hr	8,760 hr/yr	0.4 tpy
111	Heater	Sewage Treatment Plant	2 lb/1,000 gal	Table 1.3-1, AP-42	1.7 MMBtu/hr	8,760 hr/yr	0.1 tpy
112	Various Heaters	Environmental Field Office	2 lb/1,000 gal	Table 1.3-1, AP-42	0.075 MMBtu/hr	8,760 hr/yr	0.005 tpy
113	Various Heaters	Potable Water Treatment	2 lb/1,000 gal	Table 1.3-1, AP-42	0.04 MMBtu/hr	8,760 hr/yr	0.00 tpy
114	Various Heaters	Redpath Construction Offices	2 lb/1,000 gal	Table 1.3-1, AP-42	0.3 MMBtu/hr	8,760 hr/yr	0.0 tpy
116	Various Heaters	Lower Warehouse	2 lb/1,000 gal	Table 1.3-1, AP-42	1.3 MMBtu/hr	8,760 hr/yr	0.1 tpy
118	Various Heaters	1875 Portal Shop	2 lb/1,000 gal	Table 1.3-1, AP-42	0.368 MMBtu/hr	8,760 hr/yr	0.02 tpy
119	Various Heaters	Mill Bench Maintenance Office	2 lb/1,000 gal	Table 1.3-1, AP-42	0.76 MMBtu/hr	8,760 hr/yr	0.05 tpy
208	Cummins QSX15-G9	Mill Bench Bank Unit No. 1	0.4265 kg/MW-hr	Table 3.4-1, AP-42	70.8 gal/MW-hr	185,000 gal/yr ^b	1.2 tpy
209	Cummins QST30-G5	Mill Bench Bank Unit No. 2	0.4265 kg/MW-hr	Table 3.4-1, AP-42	70.8 gal/MW-hr		
210	Cummins QST30-G5	Mill Bench Bank Unit No. 3	0.4265 kg/MW-hr	Table 3.4-1, AP-42	70.8 gal/MW-hr		
220	CAT 3516C Engine	Lower Camp	0.0362 kg/MW-hr	Vendor	69.6 gal/MW-hr		
221	CAT C15 Engine	Lower Camp	0.0616 kg/MW-hr	Vendor	81.7 gal/MW-hr		
218	Fi-Fi Pump Engine	Permanent Fire Water Pump Building	0.0022 lb/hp-hr	Table 3.3-1, AP-42	165 bhp	200 hr/yr	0.04 tpy
302	Explosives (underground)	Exhaust from 1690 Portal	0.0013 lb/ton	Engineering	7,150 lb/day	365 day/yr	0.001 tpy
411	Incinerator	Permanent Camp Incinerator	15 lb/ton	Table 2-1.12, AP-42	170 lb/hr	745 ton/yr	5.6 tpy
414	Heater	1525 Mine Air Heater	0.200 lb/1,000 gal ^a	Table 1.5-1, AP-42	42.2 MMBtu/hr	3 MMgal/yr ^c	0.3 tpy
415	Heater	1875 Mine Air Heater	0.200 lb/1,000 gal ^a	Table 1.5-1, AP-42	42.2 MMBtu/hr		
542	Propane Vaporizer	1875 Portal	0.200 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
543	Propane Vaporizer	1875 Portal	0.200 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
544	Propane Vaporizer	1520 Portal	0.200 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
545	Propane Vaporizer	1525 Portal	0.200 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
416	Heater	Portable Indirect Fired Heater	2 lb/1,000 gal	Table 1.3-1, AP-42	1.0 MMBtu/hr	8,760 hr/yr	0.1 tpy

	Isuzu 3LD1	Blower Engine	0.0022 lb/hp-hr	Table 3.3-1, AP-42	19.0 bhp	8,760 hr/yr	0.2 tpy
417	Heater	Portable Indirect Fired Heater	2 lb/1,000 gal	Table 1.3-1, AP-42	1.0 MMBtu/hr	8,760 hr/yr	0.1 tpy
	Isuzu 3LD1	Blower Engine	0.0022 lb/hp-hr	Table 3.3-1, AP-42	19.0 bhp	8,760 hr/yr	0.2 tpy
418	Six Heaters	Six Portable Indirect Fired Heaters	2 lb/1,000 gal	Table 1.3-1, AP-42	6.0 MMBtu/hr	8,760 hr/yr	0.4 tpy
528	Baghouse	Underground Apron Feeder No. 1	0.02 gr/scf	Vendor	2,500 ft ³ /min	8,760 hr/yr	1.9 tpy
532	Baghouse	Backfill Plant Cement Silo	0.02 gr/scf	Vendor	750 ft ³ /min	8,760 hr/yr	0.6 tpy
532A	Baghouse	Cement Screw Conveyor	0.02 gr/scf	Vendor	3,000 ft ³ /min	8,760 hr/yr	2.3 tpy
533	Baghouse	Conveyor to Surface Coarse Ore Bin	0.02 gr/scf	Vendor	5,000 ft ³ /min	8,760 hr/yr	3.8 tpy
534	Baghouse	Surface Coarse Ore Bin Apron Feeder	0.02 gr/scf	Vendor	5,000 ft ³ /min	8,760 hr/yr	3.8 tpy
540	Ducon Venture Packed Tower Scrubber	Smelting Furnace	0.02 gr/scf	Vendor	2,500 cfm	8,760 hr/yr	1.9 tpy
541	Lochhead - Haggerty Scrubber	Electric Carbon Kiln	0.02 gr/scf	Vendor	800 ft ³ /min	8,760 hr/yr	0.6 tpy
ALAB	Baghouse	Assay Lab	0.02 gr/scf	Vendor	8,500 ft ³ /min	8,760 hr/yr	6.4 tpy
ALAB2	Scrubber	Assay Lab	0.02 gr/scf	Vendor	4,000 ft ³ /min	8,760 hr/yr	3.0 tpy
ALAB3	Baghouse	Assay Lab	0.02 gr/scf	Vendor	1,000 ft ³ /min	8,760 hr/yr	0.8 tpy
ALAB4	Scrubber	Assay Lab	0.02 gr/scf	Vendor	10,000 ft ³ /min	8,760 hr/yr	7.5 tpy
CP	Portable Crusher	Portable Crusher	Various	Table 11.19.2-2, AP-42	125 tph	8,760 hr/yr	7.7 tpy
CG	Cement Guppies	Cement Guppies	0.46 lb/ton	Table 11.12-2, AP-42	22 tpd	365 d/yr	1.8 tpy
Total PM-10 Emission, Stationary Emission Units (excluding fugitive emissions, includes all EUs except 302+CP+CG)							43.6 tpy
Total PM-10 Emission, Fugitive and Explosive Emission Units (EUs 302+CP+CG)							9.5 tpy
Total PM-10 Emission, All Emission Units (excluding fugitive emissions)							53.1 tpy

^a Emission factors revised for EU 102 from 0.0044 lb/MMBtu, EUs 414-415 from 0.007 lb/MMBtu, and EUs 542-545 from 0.0044 lb/MMBtu.

^b ORL now includes EUs 220 and 221 in calculation using worst-case emission factors.

^c ORL now includes EUs 542 – 545 in calculation using worst-case emission factors.

Table B-4: Potential VOC Emissions Calculations

ID	Type	Description	Emission Factor	Source	Rated Capacity	Max Operation	VOC Emissions
102	Various Heaters	Lower Camp	0.0109 lb/MMBtu ^a	Table 1.5-1, AP-42	0.6 MMBtu/hr	8,760 hr/yr	0.0 tpy
104	Various Heaters	Water Treatment Plant	0.034 lb/1,000 gal	Table 1.3-1, AP-42	3.2 MMBtu/hr	8,760 hr/yr	0.0 tpy
106	Various Heaters	Mill Building	0.034 lb/1,000 gal	Table 1.3-1, AP-42	17.9 MMBtu/hr	8,760 hr/yr	0.0 tpy
107	Various Heaters	Filter/Backfill Plant	0.034 lb/1,000 gal	Table 1.3-1, AP-42	6.8 MMBtu/hr	8,760 hr/yr	0.0 tpy
108	Various Heaters	Permanent Camp	0.034 lb/1,000 gal	Table 1.3-1, AP-42	11.4 MMBtu/hr	8,760 hr/yr	0.0 tpy
110	Various Heaters	Truck Shop Complex	0.034 lb/1,000 gal	Table 1.3-1, AP-42	6.3 MMBtu/hr	8,760 hr/yr	0.0 tpy
111	Heater	Sewage Treatment Plant	0.034 lb/1,000 gal	Table 1.3-1, AP-42	1.7 MMBtu/hr	8,760 hr/yr	0.0 tpy
112	Heater	Environmental Field Office	0.034 lb/1,000 gal	Table 1.3-1, AP-42	0.075 MMBtu/hr	8,760 hr/yr	0.000 tpy
113	Heater	Potable Water Treatment	0.034 lb/1,000 gal	Table 1.3-1, AP-42	0.04 MMBtu/hr	8,760 hr/yr	0.00 tpy
114	Various Heaters	Redpath Construction Offices	0.034 lb/1,000 gal	Table 1.3-1, AP-42	0.3 MMBtu/hr	8,760 hr/yr	0.0 tpy
116	Various Heaters	Lower Warehouse	0.034 lb/1,000 gal	Table 1.3-1, AP-42	1.3 MMBtu/hr	8,760 hr/yr	0.0 tpy
118	Various Heaters	1875 Portal Shop	0.034 lb/1,000 gal	Table 1.3-1, AP-42	0.368 MMBtu/hr	8,760 hr/yr	0.0004 tpy
119	Various Heaters	Mill Bench Maintenance Office	0.034 lb/1,000 gal	Table 1.3-1, AP-42	0.76 MMBtu/hr	8,760 hr/yr	0.001 tpy
208	Cummins QSX15-G9	Mill Bench Bank Unit No. 1	0.7603 kg/MW-hr	Vendor	70.8 gal/MW-hr	185,000 gal/yr ^b	2.2 tpy
209	Cummins QST30-G5	Mill Bench Bank Unit No. 2	0.7603 kg/MW-hr	Vendor	70.8 gal/MW-hr		
210	Cummins QST30-G5	Mill Bench Bank Unit No. 3	0.7603 kg/MW-hr	Vendor	70.8 gal/MW-hr		
220	CAT 3516C engine	Lower Camp	0.1742 kg/MW-hr	Vendor	69.6 gal/MW-hr		
221	CAT C15 Engine	Lower Camp	0.0536 kg/MW-hr	Vendor	81.7 gal/MW-hr		
218	Fi-Fi Pump Engine	Permanent Fire Water Pump Building	0.0025 lb/hp-hr	Table 3.3-1, AP-42	165 bhp	200 hr/yr	0.04 tpy
411	Incinerator	Permanent Camp Incinerator	15 lb/ton	Table 2-1.12, AP-42	170 lb/hr	745 ton/yr	5.6 tpy
414	Heater	1525 Mine Air Heater	1 lb/1,000 gal ^a	Table 1.5-1, AP-42	42.2 MMBtu/hr	3 MMgal/yr ^c	1.5 tpy
415	Heater	1875 Mine Air Heater	1 lb/1,000 gal ^a	Table 1.5-1, AP-42	42.2 MMBtu/hr		
542	Propane Vaporizer	1875 Portal	1 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
543	Propane Vaporizer	1875 Portal	1 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
544	Propane Vaporizer	1520 Portal	1 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
545	Propane Vaporizer	1525 Portal	1 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
416	Heater	Portable Indirect Fired Heater	0.034 lb/1,000 gal	Table 1.3-1, AP-42	1.0 MMBtu/hr	8,760 hr/yr	0.001 tpy
	Isuzu 3LD1	Blower Engine	0.0025 lb/hp-hr	Table 3.3-1, AP-42	19.0 bhp	8,760 hr/yr	0.2 tpy
417	Heater	Portable Indirect Fired Heater	0.034 lb/1,000 gal	Table 1.3-1, AP-42	1.0 MMBtu/hr	8,760 hr/yr	0.001 tpy
	Isuzu 3LD1	Blower Engine	0.0025 lb/hp-hr	Table 3.3-1, AP-42	19.0 bhp	8,760 hr/yr	0.2 tpy
418	Six Heaters	Six Portable Indirect Fired Heaters	0.034 lb/1,000 gal	Table 1.3-1, AP-42	6.0 MMBtu/hr	8,760 hr/yr	0.007 tpy
	Storage Tanks	Tanks 4.0				8,760 hr/yr	13.0 tpy
	Storage Tanks	Tanks 4.0				8,760 hr/yr	13.0 tpy
Total VOC Emission, Stationary Emission Units							35.8 tpy
Total VOC Emission, All Emission Units							35.8 tpy

^a Emission factors revised for EU 102 from 0.0055 lb/MMBtu, EUs 414-415 from 0.0055 lb/MMBtu, and EUs 542-545 from 0.0055 lb/MMBtu.

^b ORL now includes EUs 220 and 221 in calculation using worst-case emission factors.

^c ORL now includes EUs 542 – 545 in calculation using worst-case emission factors.

Table B-5: Potential SO₂ Emissions Calculations

ID	Type	Description	Emission Factor	Source	Rated Capacity	Max Operation	SO ₂ Emissions
102	Various Heaters	Lower Camp	0.0164 lb/MMBtu ^a	Table 1.5-1, AP-42	0.6 MMBtu/hr	8,760 hr/yr	0.0 tpy
104	Various Heaters	Water Treatment Plant	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	3.2 MMBtu/hr	8,760 hr/yr	4.4 tpy
106	Various Heaters	Mill Building	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	17.9 MMBtu/hr	8,760 hr/yr	24.4 tpy
107	Various Heaters	Filter/Backfill Plant	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	6.8 MMBtu/hr	8,760 hr/yr	9.3 tpy
108	Various Heaters	Permanent Camp	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	11.4 MMBtu/hr	8,760 hr/yr	15.5 tpy
110	Various Heaters	Truck Shop Complex	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	6.3 MMBtu/hr	8,760 hr/yr	8.6 tpy
111	Heater	Sewage Treatment Plant	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	1.7 MMBtu/hr	8,760 hr/yr	2.3 tpy
112	Heater	Environmental Field Office	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	0.075 MMBtu/hr	8,760 hr/yr	0.102 tpy
113	Heater	Potable Water Treatment	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	0.04 MMBtu/hr	8,760 hr/yr	0.05 tpy
114	Various Heaters	Redpath Construction Offices	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	0.3 MMBtu/hr	8,760 hr/yr	0.4 tpy
116	Various Heaters	Lower Warehouse	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	1.3 MMBtu/hr	8,760 hr/yr	1.8 tpy
118	Various Heaters	1875 Portal Shop	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	0.368 MMBtu/hr	8,760 hr/yr	0.5 tpy
119	Various Heaters	Mill Bench Maintenance Office	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	0.76 MMBtu/hr	8,760 hr/yr	1.0 tpy
208	Cummins QSX15-G9	Mill Bench Bank Unit No. 1	1.4756 kg/MW-hr ^b	Table 3-4.1, AP-42	70.8 gal/MW-hr	185,000 gal/yr ^c	4.3 tpy
209	Cummins QST30-G5	Mill Bench Bank Unit No. 2	1.4756 kg/MW-hr ^b	Table 3-4.1, AP-42	70.8 gal/MW-hr		
210	Cummins QST30-G5	Mill Bench Bank Unit No. 3	1.4756 kg/MW-hr ^b	Table 3-4.1, AP-42	70.8 gal/MW-hr		
220	CAT 3516C engine	Lower Camp	1.4756 kg/MW-hr	Table 3-4.1, AP-42	69.6 gal/MW-hr		
221	CAT C15 Engine	Lower Camp	0.0021 lb/hp-hr	Table 3.3-1, AP-42	81.7 gal/MW-hr		
218	Fi-Fi Pump Engine	Permanent Fire Water Pump Building	0.0037 lb/hp-hr	Table 3.3-1, AP-42	165 bhp	200 hr/yr	0.1 tpy
302	Explosives (underground)	Exhaust from 1690 Portal	2 lb/ton	Table 13.3-1, AP-42	7,150 lb/day	365 day/yr	1.3 tpy
411	Incinerator	Permanent Camp Incinerator	2.5 lb/ton	Table 2-1.12, AP-42	170 lb/hr	745 ton/yr	0.9 tpy
414	Heater	1525 Mine Air Heater	1.500 lb/1,000 gal ^a	Table 1.5-1, AP-42	42.2 MMBtu/hr	3 MMgal/yr ^d	2.3 tpy
415	Heater	1875 Mine Air Heater	1.500 lb/1,000 gal ^a	Table 1.5-1, AP-42	42.2 MMBtu/hr		
542	Propane Vaporizer	1875 Portal	1.500 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
543	Propane Vaporizer	1875 Portal	1.500 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
544	Propane Vaporizer	1520 Portal	1.500 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
545	Propane Vaporizer	1525 Portal	1.500 lb/1,000 gal ^a	Table 1.5-1, AP-42	1.0 MMBtu/hr		
416	Heater	Portable Indirect Fired Heater	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	1.0 MMBtu/hr		
	Isuzu 3LD1	Blower Engine	0.0021 lb/hp-hr	Table 3.3-1, AP-42	19.0 bhp	8,760 hr/yr	0.2 tpy
417	Heater	Portable Indirect Fired Heater	42.6 lb/1,000 gal ^b	Table 1.3-1, AP-42	1.0 MMBtu/hr	8,760 hr/yr	1.4 tpy
	Isuzu 3LD1	Blower Engine	0.0021 lb/hp-hr	Table 3.3-1, AP-42	19.0 bhp	8,760 hr/yr	0.2 tpy
418	Six Heaters	Six Portable Indirect Fired Heaters	42.6 lb/1,000 gal	Table 1.3-1, AP-42	6.0 MMBtu/hr	8,760 hr/yr	8.2 tpy

Total SO₂ Emission, Stationary Emission Units (Includes all EUs except 302)	87.1 tpy
Total SO₂ Emissions, Explosive Emission Units (EU 302)	1.3 tpy
Total SO₂ Emission, All Emission Units	88.4 tpy

^a Emission factors revised for EU 102 from 0.002 lb/MMBtu, EUs 414-415 from 0.002 lb/MMBtu, and EUs 542-545 from 0.002 lb/MMBtu.

^b Diesel sulfur content revised to 0.3 percent by weight (from 0.4 percent).

^c ORL now includes EUs 220 and 221 in calculation using worst-case emission factors.

^d ORL now includes EUs 542 – 545 in calculation using worst-case emission factors.