



# TINTINA MONTANA

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February 20, 2018

Julie Merkel, Supervisor  
Permitting Services Section  
Air Quality Bureau  
Department of Environmental Quality  
P.O. Box 200901  
Helena, MT 59620-0901

Dear Ms. Merkel:

Tintina Montana Inc. (Tintina) is submitting this request to the Montana Department of Environmental Quality, Air Quality Bureau for a Montana Air Quality Permit for the Black Butte Copper Project near White Sulphur Springs, Montana.

Enclosed are the original permit application, Air Quality Permit Application for Stationary Sources forms (including the application certification), and supporting documentation. The affidavits of publication of the public notice will be submitted as soon as they are received. Also enclosed is the permit application fee of \$2000 for a "new facility subject to Subchapters 7 and 12, but not subject to Subchapters 8, 9, or 10" as required by ARM 17.8.504(1)(b)(i)(A).

Please contact me at (406) 547-3466 or Debbie Skibicki, our consultant at Bison Engineering Inc., at (406) 442-5768 if you have any questions.

Based on information and belief formed after reasonable inquiry, the statements made in this document are true, accurate and complete.

Sincerely,

John Shanahan

President & Chief Executive Officer

Attachments

# MONTANA AIR QUALITY PERMIT APPLICATION



*Submitted by:*

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*Prepared by:*



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February 2018

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## ACRONYMS AND ABBREVIATIONS

acfm	Actual cubic feet per minute
ARM	Administrative Rules of Montana
BACT	Best Available Control Technology
BBCP	Black Butte Copper Project
CAA	Clean Air Act
cfm	Cubic feet per minute
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
CTF	Cemented Tailings Facility
dcfm	Dry cubic feet per minute
DEM	Digital elevation model
dscfm	Dry standard cubic feet per minute
EF	Emission factor
EPA	U.S. Environmental Protection Agency
F	Fahrenheit
FCAA	Federal Clean Air Act
fps	Feet per second
ft	Feet
GEP	Good engineering practice
gr	Grains
H <sub>2</sub> O	Water
HAP	Hazardous air pollutant
HDPE	High-density polyethylene
hr/yr	Hours per year
K	Kelvin
km	Kilometer
lb/MMBtu	Pounds per million British thermal units
lbs	Pounds
lb/hr	Pounds per hour
LRT	Long range transport
m	Meter
MACT	Maximum Achievable Control Technology

MAAQS	Montana Ambient Air Quality Standards
MAQP	Montana Air Quality Permit
MCAA	Montana Clean Air Act
MCA	Montana Code Annotated
MDEQ	Montana Department of Environmental Quality
MMBtu/hr	Million British Thermal Units per hour
µg/m <sup>3</sup>	Micrograms per cubic meter
MOY	Mine operating year
N	Nitrogen
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Dataset
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO <sub>x</sub>	Nitrogen oxides
NO <sub>2</sub>	Nitrogen dioxide
NSPS	New Source Performance Standards
NSR	New Source Review
NWS	National Weather Service
O <sub>3</sub>	Ozone
OAQPS	Office of Air Quality Planning and Standards
PM	Particulate matter
PM <sub>10</sub>	Particulate matter with an aerodynamic diameter of 10 micrometers or less
PM <sub>2.5</sub>	Particulate matter with an aerodynamic diameter of 2.5 micrometers or less
PSD	Prevention of Significant Deterioration
PTE	Potential to emit
PWP	Process Water Pond
RBLC	EPA RACT/BACT/LAER Clearinghouse
RICE	Reciprocating Internal Combustion Engine
S	Sulfur
SAG	Semi-autogenous Grinding
SDTS	Spatial Data Transfer Standard
SER	Significant Emissions Rate
SIL	Significant Impact Level
SO <sub>2</sub>	Sulfur dioxide
TPH	Tons per hour
tpy	Tons per year
VMT	Vehicle miles traveled
VOC	Volatile organic compound
USGS	U.S. Geological Survey
WRS	Waste Rock Storage



## 1.0 INTRODUCTION

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Tintina Montana Inc. (Tintina) a wholly owned subsidiary of Sandfire Resources America Inc., proposes to develop and operate a new underground copper mine and mill at its Black Butte Copper Project (BBCP) site located 15 miles north of White Sulphur Springs in Meagher County, Montana (Figure 1). Tintina is filing this application with the Montana Department of Environmental Quality (MDEQ) for a Montana Air Quality Permit (MAQP) to construct and operate the BBCP.

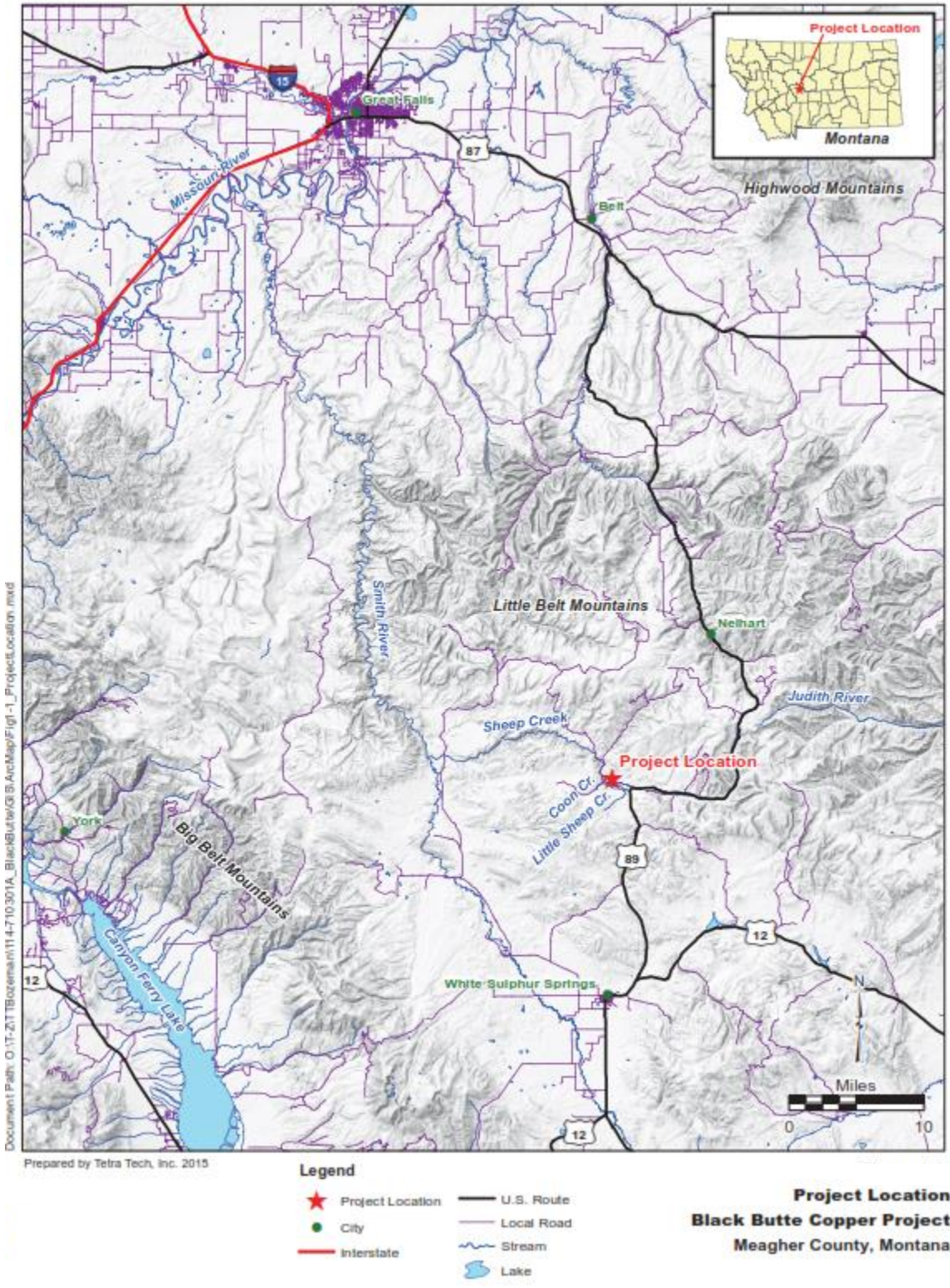
The BBCP proposes to produce and ship copper concentrate mined from both the upper and lower zones of the Johnny Lee copper deposit. All operations will occur within a Mine Permit boundary (the Mine Operating Permit Application is currently undergoing environmental review by MDEQ's Hard Rock Mining Bureau) encompassing 1,888 acres of privately owned ranch land under lease to Tintina. Total surface disturbance required for construction and operation of all mine-related facilities and access roads comprises 295.9 acres. The proposed operation will mine a total of approximately 15.3 million tons of combined copper-enriched rock and waste rock. This includes 14.5 million tons of copper-enriched rock with an average grade of 3.04% copper, and 0.8 million tons of waste rock. Mining will occur at a rate of approximately 1.3 million tons per year or 3,640 tons of copper-enriched rock per day, over a mine life of approximately 19 years (including two years of construction and pre-production mining, 13 years of active production mining, and four years of reclamation and closure). The mining company will directly employ approximately 240 workers, with an additional 24 contract miners working at the site during the first four years of mining. It will require a maximum of approximately 144 sub-contracted employees during the initial 30 to 36 months of support facility construction.

### 1.1 Background

Mineral exploration in the BBCP area began with limited small-scale underground development for copper mineralization in 1894 and has had some limited exploration presence in the area since that time. Tintina acquired the rights to mine the property in May of 2010 and has conducted surface exploration activities at the Project site since September 2010. Tintina has recently applied for a Mine Operating Permit, which is under consideration by the MDEQ Hard Rock Mining Bureau.

With respect to air quality permitting, Tintina currently holds MAQP #4978-00 for emissions sources associated with an exploration decline, which was never constructed. This application (for a new air quality permit) supersedes the previous permit and moves past the exploration stage to the development and operation of the BBCP in accordance with the requirements of the Montana Clean Air Act (MCAA), the Federal Clean Air Act (FCAA), and the rules adopted pursuant to these acts: Administrative Rules of Montana (ARM), Section 17.8.740, *et seq.* This application covers the emissions units, both point and fugitive, associated with the mine and mill development, production/ operation and closure stages.

**Figure 1 – Project Location for the Black Butte Copper Project**



## 1.2 Current Action

The BBCP will be classified as a minor stationary source of air pollutant emissions for the purposes of the New Source Review - Prevention of Significant Deterioration (NSR-PSD) regulations. Tintina is submitting this application for a new minor source MAQP. This application is intended to satisfy the requirements of the Administrative Rules of Montana (ARM) 17.8, Subchapter 7 by providing the following information:

- A description of the proposed facility and planned operations (Section 2).
- An analysis of potential pollutant emission rates from fugitive and point sources (Section 3). Detailed emissions calculations are also provided in Appendix C.
- An analysis of state and federal air quality regulations that will potentially apply to the facility and its operations (Section 4).
- An evaluation and identification of best available control technologies (BACT) for applicable emissions sources and pollutants (Section 5).
- An analysis of potential impacts of the proposed facility and operations on local ambient air quality (Section 6).
- Completed MAQP application forms (Appendix A) including:
  - A certification of truth, accuracy, and completeness signed by a responsible official of the applicant company;
  - Proof of public notice as required by ARM 17.8.748(7).
- Facility site plan and mill diagram (Appendix B). See Section 2, Figure 2 for process flow diagram. For additional diagrams, see the Mine Operating Permit Application<sup>1</sup>.
- An air quality permit application fee in the amount prescribed by ARM 17.8.504.

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<sup>1</sup> The Mine Operating Permit Application can be viewed at [http://deg.mt.gov/Portals/112/Land/Hardrock/Documents/TintinaRevisionIII/BBC%20Mine%20Operating%20Permit%20Revision%203\\_07-14-17.pdf](http://deg.mt.gov/Portals/112/Land/Hardrock/Documents/TintinaRevisionIII/BBC%20Mine%20Operating%20Permit%20Revision%203_07-14-17.pdf)

## **2.0 PROJECT DESCRIPTION**

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### **2.1 Site Description**

Tintina proposes to develop the BBCP approximately 15 miles north of White Sulphur Springs in Meagher County, Montana. A Mine Permit boundary will encompass all operations within 1,888 acres of privately owned ranch land under lease to Tintina. Total surface disturbance required for construction and operation of all mine-related facilities and access roads comprises approximately 295 acres. The proposed mine permit area resides in Sections 24, 25, and 36 in Township 12N, Range 6E, and Sections 19, 29, 30, 31, and 32 in Township 12N, Range 7E. The main area of the mine is located at UTM coordinates 506,725 meters East, 5,179,710 meters North (NAD 83, Zone 12).

The area is characterized by forested mountains and rolling hills of the Little Belt Mountains; grasslands and shrub lands; and creeks supplying the upper Sheep Creek drainage. Conifer Forest and Woodland habitat types are located within the surrounding area and include species of Douglas-fir, common juniper (less frequent), and Engelmann spruce (infrequent). Grassland and shrub land varies considerably among vegetation types in the area. Cropland is comprised of hay crops grown throughout the area and within the Sheep Creek floodplain.

The climatology of the immediate project area is boreal and is classified as a snowy climate with fully humid, warm summers. Adjacent rangeland is classified as a cold arid steppe.<sup>2</sup> Rainfall is approximately 13 inches per year for White Sulphur Springs, while 18.42 inches was the average precipitation measured at the onsite meteorological station from 2012-2016.

The air quality of this area is classified as either “better than national standards” or “unclassifiable/attainment” with respect to National Ambient Air Quality Standards (NAAQS) and Montana Ambient Air Quality Standards (MAAQS) for all criteria pollutants. There are no non-attainment areas near the site. The nearest Class I area, the Gates of the Mountains Wilderness Area, is approximately 38 miles northwest of the proposed mine boundary.

### **2.2 Process Description**

The proposed Black Butte Copper Project will mine approximately 15.3 million tons of copper-enriched rock (CER) and waste rock. This includes 14.5 million tons of CER with an average grade of 3.04% copper and 0.8 million tons of waste rock. Mining will occur at a rate of approximately 1.3 million tons/year or roughly 3,640 tons of CER per day. The expected life of the mine is approximately 19 years including: a two-year development phase consisting of construction and pre-production mining, approximately 13 years of active mine production and milling, and four years of reclamation and closure.

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<sup>2</sup> Per Koppen-Geiger climate map, available from <http://koeppen-geiger.vu-wien.ac.at/>

Tintina plans to mine copper-enriched rock from the upper and lower Johnny Lee mining zones. The mine permit boundary area is divided into three main property areas by the Sheep Creek Road and Butte Creek Road intersections (See Appendix B, Figure 1). The northwest sector contains the mine ventilation raises, while the northeast portion contains an access to a proposed public water supply well utilized by Tintina. The southern property sector contains all mining operations including the mine portal, milling and material processing facilities, two emergency backup reciprocating internal combustion engine (RICE) gensets, a cemented paste tailings facility, material stockpiles, and various water containment ponds. The Facilities Site Plan is included in Appendix B.

The mining process will use a drift and fill method where approximately 45% of the finely ground mill tailings will be mixed with cement and binder to form a paste and used to backfill production workings during the mining of successive drifts. This paste backfill method allows maximum extraction of copper-enriched rock without the need to leave pillars for structural support. The backfill also eliminates the risk of subsidence to surface and minimizes groundwater contact with mineralized rock both during operations and after closure. The use of paste backfilling and the drift and fill mining method minimizes the surface area of the underground mineral deposit exposed (to a few percent) to circulating air and moving groundwater at any given time during the mine life.

All mined rock will be brought to the surface through a single mine portal along a decline (tunnel) providing additional lower ramp access to the upper and lower Johnny Lee zones. The mined material will be crushed and sized in the enclosed Jaw Crusher building and travel in an enclosed conveyor for further processing (regrinding and flotation) in the milling building in order to liberate and concentrate copper for future smelting. All processing facilities (beyond temporary crushers and portable screens, which will use enclosures and water spray) utilize enclosed conveyors (or conveyors enclosed within buildings) and high efficiency dust collectors to minimize particulate emissions. The Process Flow Diagram of the mine is included in Appendix B. Referring to these diagrams will help contextualize the description of surface activities.

### **2.2.1 Milling and Flotation Processes**

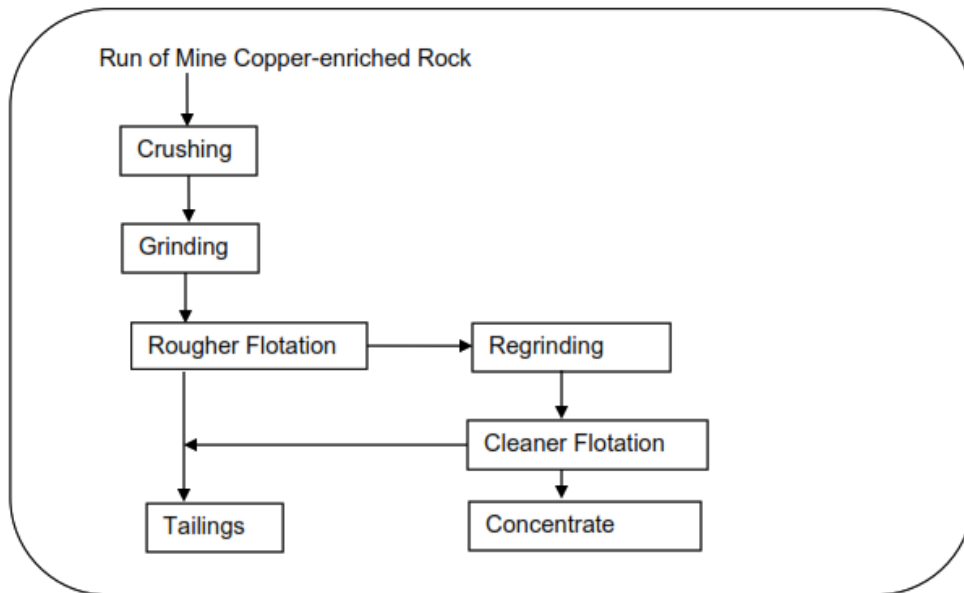
Resource material will be trucked from the underground mining operations to the portal pad and will be dumped directly onto stationary and vibrating grizzly screens. These screens either feed or bypass a jaw crusher. After screening or crushing, an enclosed conveyor will move the raw material to a surge bin on the mill pad in preparation for further size reduction in the grinding mills. A dust collector will control fugitive dust emissions from the enclosed crushing operation. Alternatively, rock can also be placed onto the 82,600-ton copper-enriched stockpile for later crushing and milling.

Crushed material will be conveyed (enclosed conveyor) from the surge bin to the grinding circuit within the mill building. The surge bin is controlled with a dust collector, as is the mill building (dust collection system). Further size reduction occurs in wet grinding mills as the crushing and grinding stages of the milling process liberate copper minerals to allow for their effective separation during the flotation process and the formation of copper concentrates. Effective liberation of copper minerals from the host rock requires grinding

to the point where 80% of material measures smaller than 30 microns in diameter (<0.001 inches). The grinding plant will employ three stages of grinding, which crush and grind copper-enriched rock sequentially to complete the grinding process. The first stage of grinding is semi-autogenous grinding (SAG), followed by ball mill grinding, and finally stirred milling in a tower mill. Each of the mills will operate with a cyclone classification circuit to manage particle sizes of the ground material between mills, and ultimately to control the particle size sent to the flotation process.

A dust collection system will capture fugitive dust from various areas inside the mill building, but generally, the treatment system is a wet process and requires little dust collection. The mill building and mill area will contain areas for the following processes: grinding, flotation, regrinding, concentrate dewatering and handling, reagent handling, paste backfill (separate building to east of mill building), and tailings thickening (adjacent to the paste plant and mill building). Figure 2 provides a general process flow for the sizing and flotation processes at the BBCP.

**Figure 2: Surface Processes Overview**



After the grinding stage, a flotation process will liberate fine-grained copper minerals from the bulk of the mined rock to form copper concentrate. The water-based flotation processes rely upon the chemical interaction between fine-grained mineral particles and hydrocarbon-based reagents to separate specific minerals into concentrates. Copper minerals adhere to bubbles formed during agitation of the slurry of water and finely ground rock in a flotation cell. The bubbles then carry the copper minerals to the fluid surface and form a copper mineral-rich surface froth. Skimming the froth effectively separates the copper minerals from the slurry, and the skimmed froth routes to a thickening and filtering circuit to remove the water. The copper minerals concentrate in the froth formed on the fluid surface of the flotation cell. This separation forms the basis of the flotation process. This fine-grained high-grade concentrate is suitable for sale in the world market. The

flotation milling facility is designed to process up to 3,640 tons of copper-enriched rock per day throughout two 12-hour shifts. It will operate 365 days per year.

The milling process will produce approximately 440 tons of copper-rich concentrate per day. That concentrate will travel via conveyor to the concentrate load-out building. The concentrate will contain approximately 10% moisture at this time and will produce negligible emissions from handling due to the moisture content. The concentrate will be sealed in enclosed containers for shipping. The concentrate containers will be shipped by truck to a regional railhead facility in Montana and from there either directly to a smelter or to a port where it will be loaded onto ships for transport to an overseas smelter. The use of shipping containers eliminates the need for surface stockpiles and multiple handling stages during transport which mitigates fugitive air pollution emissions.

The two emergency backup RICE gensets will be located near the mill building and be available in the event of a power outage during the production phase (emissions calculated at 500 hours per year). Other, portable smaller RICE will be used at various locations across the site during the construction and development phase (emissions calculated at 8760 hours per year).

### **2.2.2 Cemented Tailings Facility (CTF) and Process Water Pond (PWP)**

All future waste rock will be placed into the CTF along with the mill tailings. However, a temporary waste rock storage (WRS) facility, lined with high-density polyethylene (HDPE) geomembrane, will be constructed between the portal and the mill. The WRS pad will receive all waste rock generated until construction of the cemented tailings facility (CTF) is completed. The temporary WRS pad will be completely reclaimed in year three.

No mined waste rock will be left exposed on the surface after closure of the CTF. The CTF will be dewatered (if any is present), sealed with a cover of HDPE geotextile, and reclaimed in closure. A separate stockpile on a smaller lined pad will be constructed off the northwest corner of the portal pad near the end of the construction period to contain a reserve of copper-enriched rock for mill feed should underground mining production be temporarily limited.

A process water pond (PWP), double lined with HDPE, with an underlying foundation drain and pond, will store water needed for milling. Water will be recycled between the process water pond and the mill during operations. A paste plant in the mill complex will mix fine-grained tailings from the milling process with a binder (the binder is a combination of cement and fly ash) for deposition both underground and in the cemented tailings facility. The plant will mix approximately 45% of the tailings with approximately 4% cement and other binders to be used as paste backfill in the underground mine workings.

The other 55% of the tailings will be mixed with 0.5 to 2% cement and other binders, which will be pumped to the cemented tailings facility where it will set up to form a non-flowable mass. The use of cemented tailings inhibits dust formation and provides added strength. The small amount of free water that collects in the CTF sump from cemented tailings seepage will be pumped to the PWP for reuse in the mill. Water not needed in the

mill during mining operations will be pumped directly from the PWP to the reverse osmosis (RO) water treatment facility for treatment and then released to the underground infiltration galleries.

### **2.2.3 Material Stockpiles**

Five main material stockpiles will be used for reclamation material (excavated bedrock, two stockpiles), topsoil, subsoil, and temporary construction material. Stockpiles will be wind-fenced and/or treated with water or chemical dust suppressants as necessary to maintain compliance with reasonable precautions requirements. Soil and subsoil stockpiles will be revegetated in place prior to their use in mine closure.

### **2.2.4 Underground Emissions**

Four 16-foot diameter raises will be constructed from the mining zones to the surface to provide ventilation. These airways clear fumes from blasting and diesel equipment while also providing fresh air to the underground work areas. Both the upper and lower Johnny Lee zones will each utilize two ventilation raises, with one providing fresh air to the respective zone and the other providing a channel for exhaust from the mining area. Thus, the entire project will utilize two intake ventilation raises and two exhaust raises. The two exhaust raises, in addition to the portal, constitute sources of air pollution from underground activities and are accounted for in the model.

The underground vent raises include the two types of emissions listed above as well as emissions from the direct-fired propane-fueled heaters. The vent heaters provide seasonal heat to the intake vents and, as such, are limited in usage from October to April (212 days or 5088 hours of operation). The vent heaters and blasting emissions (ANFO) are included in both potential emissions estimates for permitting and regulatory applicability as well as their contributions to the modeled vent emissions. Underground mobile source diesel equipment is exempt from permitting but is included in the ambient air quality impacts analysis only as those emissions exit through the vents.

## **2.3 Emissions Units Description**

The following table provides a general list of emissions units and what phase they may be operating in (and, in some cases, what hours for each phase). All of these units are being permitted regardless of the phase to allow flexibility during the transition between development and production phases. Underground mobile sources, while included in the ambient air quality demonstration, are not subject to permitting and are not included in the table. In addition, contracted equipment may be on site (including a temporary construction crusher and a temporary concrete batch plant, as seen in Appendix B – Figure 2), but any associated permitting be the responsibility of that particular contractor.

In general, the mine development phase will take place between mine operating years (MOY) zero and 2 or 2.5, with the production phase starting in MOY 2 or 2.5 through approximately MOY 15. Reclamation phase will follow in MOY 16-18. For simplicity, the



reclamation phase activities are included in the production phase activity for the table below.

**Table 2-1: BBCP Proposed Emitting Sources and Anticipated Use**

EMITTING UNIT		Development Phase (hr/yr)	Production Phase (hr/yr)
ID	Name		
P1	250 TPH Portable Conical Crusher	8760	N/A
P2	325-hp Portable Diesel Eng/Gen	8760	N/A
P3	2 – Portable Screens (400 TPH each)	8760	N/A
P4	131-hp Portable Diesel Eng/Gen	8760	N/A
P5	545-kW/914-hp Portable Diesel Eng/Gen	8760	500
P6	320-kW/1675-hp Portable Diesel Eng/Gen	8760	500
P7	2- 1000-kW/1675-hp Diesel Eng/Gen - Emergency backup	N/A	500
P8	100-hp Diesel Eng/Gen – Emergency evac hoists	N/A	500
P9	50-hp Diesel Fire Pump – Emergency	500	500
P10A	23 MMBtu/hr Propane-fired Heater – Intake Vent for Upper Copper Zone	N/A	5088
P10B	52 MMBtu/hr Propane-fired Heater – Intake Vent for Lower Copper Zone	N/A	5088
P11	3 Temporary diesel heaters at Portal - (1.2 MMBtu/hr total)	8760	N/A
P12	3640 TPD Jaw Crusher	N/A	8760
P13A	Mill Building (mill, lime storage, etc.)	N/A	8760
P13B	Mill Building (lime area/slurry mix tank)	N/A	8760
P14	Surge Bin Discharge	N/A	8760
P15	Water Treatment Plant Lime Area	N/A	8760
P16A	Backfill Plant Cement/Fly Ash Hopper	8760	8760
P16B	Backfill Plant Cement/Fly Ash Silo	8760	8760
P17	4- Portable Diesel Eng/Gen (400-hp total)	8760	8760

P18	Air Compressor - 275-hp Diesel Engine	8760	N/A
UG	ANFO	8760	8760
F1	Road Dust, Mine Operating Year (MOY) 0 to 1	8760	N/A
F2	Road Dust, MOY 1 to 2	8760	N/A
F3	Road Dust, MOY 2 to 15, Annual Average	N/A	8760
F4	Road Dust, MOY 16 and 17, Annual Average	N/A	8760
F5	Road Dust, MOY 18	N/A	8760
F6	Material Transfer to Temporary Stockpile, MOY 0 to 1.5	8760	N/A
F7	Temporary Construction Stockpile	8760	N/A
F8	Embankment Construction, MOY 0 to 1.5	8760	N/A
F9	Backfill, Non-contact Water Reservoir (NCWR) Embankment Material to Cemented Tailings Facility (CTF), MOY 16 to 18	N/A	8760
F10	Material Transfer to South Stockpile, MOY 0 to 1	8760	N/A
F11	Excess Reclamation Stockpile (South)	8760	8760
F12	Material Transfer from South Stockpile, MOY 16 to 17	N/A	8760
F13	Material Transfer to North Stockpile, MOY 0 to 1	8760	N/A
F14	Excess Reclamation Stockpile (North)	8760	8760
F15	Material Transfer from North Stockpile, MOY 16 to 18	N/A	8760
F16	Soil Removal and Stockpiling, MOY 0 to 1	8760	N/A
F17	Topsoil Pile	8760	8760
F18	Subsoil Pile	8760	8760
F19	Soil Return, MOY 16 to 18	N/A	8760
F20	Copper-enriched Rock Drop to Stockpile, MOY 2 to 3	8760	N/A
F21	Copper-enriched Rock Stockpile (Mill Feed)	N/A	8760

F22	Waste Rock Drop at Waste Rock Storage (WRS) Pad, MOY 0 to 1.5, at CTF, MOY 1.5 to 4 and 8	8760	8760
F23	Temporary WRS	8760	N/A
F24	Waste Rock Transfer from WRS to CTF, MOY 2 to 3	8760	N/A
F25	Waste Rock Storage Pad Reclamation, MOY 3	N/A	8760
F26	11 - 14-hp Portable Diesel-powered Light Plants (only 4 units will be used in Production Phase)	8760	8760
F27	500-gal Gasoline Storage Tank (double-walled)	8760	8760
F28	9 -Temporary Portable Propane-fired Heaters (37.8 MMBtu/hr total) (only 3 will be used in Production Phase)	8760	8760
F29	Road Dust, Construction Access Road, Year 0-2 Avg.	8760	N/A
F30	Road Dust, Main Access Road, Year 2-15 Avg.	8760	8760
IEU1	Diesel Storage Tanks (250-gal, 500-gal, 10,000-gal)	8760	8760

## 3.0 EMISSION INVENTORY

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### 3.1 Criteria Pollutant Emission Inventory

The criteria air pollutants to be emitted from the BBCP mine include:

- Nitrogen oxides (NO<sub>x</sub>),
- Particulate matter with an aerodynamic diameter less than 10 microns (PM<sub>10</sub>),
- Particulate matter with an aerodynamic diameter less than 2.5 microns (PM<sub>2.5</sub>),
- Sulfur dioxide (SO<sub>2</sub>),
- Volatile organic compounds (VOCs),
- Carbon monoxide (CO), and
- Greenhouse gases expressed as carbon dioxide equivalent (CO<sub>2e</sub>).

Tintina has also included emission calculations for particulate matter (PM). Detailed air pollutant emissions calculations, including descriptions of related design parameters and assumptions, are presented in Appendix C. This section of the report provides a narrative overview and sample emissions calculations.

The general equation for emissions estimation is:

$$E = A \times EF \times (1 - ER/100)$$

where: E = emissions;  
A = activity rate;  
EF = emission factor; and  
ER = overall emission reduction efficiency, %.

Each emission source is categorized as either a fugitive source or point source of emissions. In the ARM, fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. All other sources are considered point sources of emissions. Because Tintina is not a listed source pursuant to ARM 17.8.801(22)(c) or ARM 17.8.1201(23)(b), fugitive emissions are not included in determining applicability with those programs. Table 3-1 lists the facility's air emissions point sources. Table 3-2 lists the facility's air emissions fugitive sources. Note: Emissions are expressed to the nearest one-hundredth (or one-thousandth, in limited cases) for presentation and calculation purposes. Multiple digit accuracy should not be assumed.

The emission factors used in this analysis were primarily obtained from three sources: 1) the EPA document, *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources (AP-42)*, Fifth Edition; 2) manufacturer's specifications for control equipment, and 3) regulatory requirements for emissions (for EPA Tier 3 stationary engines, for example). The full calculations are available in Appendix C. An example calculation is provided below for each general emission unit type.

**Table 3-1: Summary of BBCP Proposed Emitting Sources – Point Sources (Controlled)**

Point #	Emitting Unit	PM tons per year	PM <sub>10</sub> tons per year	PM <sub>2.5</sub> tons per year	SO <sub>2</sub> tons per year	NO <sub>x</sub> tons per year	CO tons per year	VOC tons per year
<b>POINT SOURCES</b>								
P1	250 TPH Portable Conical Crusher	1.31	0.59	0.11	--	--	--	--
P2	325-hp Portable Diesel Engine/generator	0.47	0.47	0.47	0.17	9.36	8.19	3.52
P3	2 Portable Screens (400 TPH each)	7.71	2.59	0.18	--	--	--	--
P4	131-hp Portable Diesel Engine/generator	0.28	0.28	0.28	0.07	3.77	4.72	1.42
P5	545-kW /914-hp Diesel Engine/generator	1.32	1.32	1.32	0.49	42.10	23.02	9.88
P6	320-kW /536-hp Diesel Engine/generator	0.77	0.77	0.77	0.03	15.45	13.52	5.80
P7	1000-kW /1675-hp Diesel Engine/generators (2) - Emergency	0.28	0.28	0.28	0.10	8.81	4.82	2.07
P8	100-hp Diesel Engine/generator - Emergency evac hoists	0.02	0.02	0.02	0.00	0.19	0.21	0.06
P9	50-hp Diesel Fire Pump - Emergency	0.01	0.01	0.01	0.00	0.10	0.10	0.03
P10A	23 MMBtu/hr Propane-fired heater @ Intake Vent for Upper Copper Zone	0.45	0.45	0.45	0.03	8.33	4.80	0.64
P10B	52 MMBtu/hr Propane-fired heater @ Intake Vent for Lower Copper Zone	1.01	1.01	1.01	0.08	18.83	10.86	1.45
P11	3 Temporary diesel heaters at Portal - (1.2 MMBtu/hr total)	0.05	0.05	0.05	0.08	0.75	0.19	0.02
P12	Jaw Crusher (3640 TPD), Building/Dust Collector	3.19	3.19	3.19	--	--	--	--
P13A	Mill Building (mill, lime storage, etc.) Dust Collector	0.19	0.19	0.19	--	--	--	--
P13B	Mill Building (lime area/slurry mix tank) Dust Collector	1.24	1.24	1.24	--	--	--	--
P14	Surge Bin Discharge Dust Collector	1.88	1.88	1.88	--	--	--	--
P15	Water Trtmt Plant Lime Area Dust Collector	1.24	1.24	1.24	--	--	--	--
P16A	Backfill Plant Cement/Fly Ash Hopper Dust Filter/Collector	0.23	0.23	0.23	--	--	--	--
P16B	Backfill Plant Cement/Fly Ash Silo Dust Filter/Collector	0.45	0.45	0.45	--	--	--	--
P17	Portable diesel engine/generators (total of 400 hp, 4 units)	1.15	1.15	1.15	0.21	13.54	14.40	4.33
P18	Air Compressor - Diesel Engine (275 hp)	0.40	0.40	0.40	0.15	7.92	6.93	2.98
F26	Diesel-powered Light plants - 11 - 14 hp each	1.48	1.48	1.48	0.008	20.91	4.51	1.67
F27	Gasoline storage tank (double-walled 500 gal)							0.07
F28	Temporary portable propane heaters (37.8 MMBtu/hr total) - 9	1.27	1.27	1.27	0.10	23.57	13.60	1.81
UG	ANFO	0.11	0.06	0.00	1.55	13.19	51.97	--
<b>TOTAL POINT SOURCES</b>		<b>26.49</b>	<b>20.60</b>	<b>17.65</b>	<b>3.07</b>	<b>186.82</b>	<b>161.83</b>	<b>35.74</b>

**Table 3-2: Summary of BBCP Proposed Emitting Sources – Fugitive Sources (Controlled)**

		Controlled PTE		
		PM tons per year	PM <sub>10</sub> tons per year	PM <sub>2.5</sub> tons per year
<b>FUGITIVE SOURCES (not included in Title V applicability)</b>				
F1	Road Dust, Mine Operating Year 0 to 1	152.70	38.92	3.90
F2	Road Dust, Mine Operating Year 1 to 2	56.42	14.38	1.44
F3	Road Dust, Mine Operating Year 2 to 15, annual average	17.79	4.53	0.45
F4	Road Dust, Mine Operating Years 16 and 17, annual average	73.80	18.81	1.88
F5	Road Dust, Mine Operating Year 18	11.68	2.98	0.30
F6	Material transfer to Temporary Stockpile, MOY 0 to 1.5	3.13	0.91	0.30
F7	Temporary construction stockpile (Table 3-13, 3.4.1)	0.002	0.001	0.000
F8	Embankment Construction, Mine Operating Year 0 to 1.5	3.13	0.91	0.30
F9	Backfill, NWCR Embankment Material to CTF, MOY 16 to 18	1.78	0.52	0.17
F10	Material transfer to South Stockpile, MOY 0 to 1	1.49	0.43	0.14
F11	Excess reclamation stockpile (South) (Table 3-13, 3.4.1)	0.002	0.001	0.000
F12	Material transfer from South Stockpile, MOY 16 to 17	1.49	0.43	0.14
F13	Material transfer to North Stockpile, MOY 0 to 1	2.13	0.62	0.20
F14	Excess reclamation stockpile (North) (Table 3-13, 3.4.1)	0.002	0.001	0.000
F15	Material transfer from North Stockpile, MOY 16 to 18	0.82	0.24	0.08
F16	Soil Removal and Stockpiling, Mine Operating Year 0 to 1	4.99	1.45	0.47
F17	Topsoil pile (Table 3-13, 3.4.1, 3.6.10)	0.002	0.001	0.000
F18	Subsoil pile (Table 3-13, 3.4.1, 3.6.10)	0.002	0.001	0.000
F19	Soil Return, Mine Operating Year 16 to 18	4.17	1.21	0.39
F20	Copper-enriched rock drop to stockpile, MOY 2 to 3	0.16	0.06	0.06
F21	Copper-enriched rock stockpile (mill feed) (Tables 3-5 & 3-13, 3.4.1)	0.003	0.002	0.000
F22	Waste Rock Drop -at WRS Pad, MOY 0 to 1.5, at CTF, MOY 1.5 to 4 and 8	0.87	0.35	0.35
F23	Temporary waste rock storage (WRS) (Table 3-5, 3-13, 3.4.1)	0.001	0.000	0.000
F24	Waste Rock Transfer from WRS to CTF, MOY 2 to 3	1.39	0.56	0.56
F25	Waste Rock Storage Pad Reclamation, MOY 3	1.65	0.48	0.16
F29	Road Dust, Construction Access Road, Year 0 - 2 Avg.	0.90	0.23	0.02
F30	Road Dust, Main Access Road, Year 2 - 15 Avg.	102.19	26.05	2.61
<b>TOTAL FUGITIVE SOURCES</b>		<b>271.33</b>	<b>69.92</b>	<b>8.54</b>
("Total" represents the worst case annual emissions from each category of source, e.g. F1: Road Dust, MOY 0 to 1 and F30: Road Dust - Main Access Road, MOY 2-15, etc.)				

### 3.1.1 Emission Point P1 - 250 tons per hour (TPH) Portable Conical Crusher

This category includes emissions produced by the conical crusher at a maximum capacity of 250 TPH. Piling factors are included in the fugitive section.

**Emission Factors:**

The source for each emission factor is summarized below.

<b>Emission Factors for Crushing (controlled)</b>		
PM	0.0012 lb/ton	AP-42 11.19.2-2 (08/04) Crushed Stone Processing and Pulverized Mineral Processing
PM <sub>10</sub>	0.00054 lb/ton	AP-42 11.19.2-2 (08/04) Crushed Stone Processing and Pulverized Mineral Processing
PM <sub>2.5</sub>	0.0001 lb/ton	AP-42 11.19.2-2 (08/04) Crushed Stone Processing and Pulverized Mineral Processing

**Control Method**

Emissions will be controlled by the use of reasonable precautions (water spray, etc.) to minimize emissions. Per MDEQ standard practice, the controlled factors were used to take reasonable precaution requirements into account.

**Example Emission Calculation**

**PM Emissions**

$$(0.0012 \text{ lb /ton}) \times (250 \text{ ton/hr}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 1.31 \text{ ton}$$

**PM<sub>10</sub> Emissions:**

$$(0.00054 \text{ lb /ton}) \times (250 \text{ ton/hr}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 0.59 \text{ ton}$$

**PM<sub>2.5</sub> Emissions:**

$$(0.0001 \text{ lb /ton}) \times (250 \text{ ton/hr}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 0.11 \text{ ton}$$

### 3.1.2 Emission Point P2 – 325-Horsepower (hp) Portable Diesel Engine/Generator

This section summarizes emissions calculation methodology used for all of the diesel engines associated with generators used in this application. Emission Point P2 is used as an example. All engines will comply with their respective EPA NSPS requirements at the time of purchase/operation. In order to provide worst-case emissions, EPA Tier 3

factors are used. The calculations are also representative of Points P4, P5, P6, P7, P8, P9, P17, P18, and F26 with emission factors varying based on engine size (per 40 CFR 89.112, Table 1). For complete calculations, please see Appendix C.

***Emission Factors:***

The source for each emission factor is summarized below.

<b>Emission Factors for Diesel Engines</b>		
PM/ PM <sub>10</sub> / PM <sub>2.5</sub>	3.29E-4 lb/hp-hr	Tier 3 engine - 40 CFR 89.112, Table 1; all PM assumed to be <1 um
SO <sub>2</sub>	1.21E-4 lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel and All Stationary Dual-Fuel Engines*
NO <sub>x</sub>	6.58E-3 lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1
CO	5.75E-3 lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1
VOC	2.47E-3 lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines

\*Emission factor based on the use of EPA-required ultra-low sulfur diesel, sulfur content of 15 parts per million

***Control Method***

Emissions will be controlled by the use of good combustion and maintenance practices in accordance with the NSPS.

***Example Emission Calculation***

**PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions**

$$(3.29E-4 \text{ lb/hp-hr}) \times (325 \text{ hp}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 0.47 \text{ ton}$$

**SO<sub>2</sub> Emissions**

$$(1.21E-4 \text{ lb/hp-hr}) \times (325 \text{ hp}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 0.17 \text{ ton}$$

**NO<sub>x</sub> Emissions**

$$(6.58 \text{ E-3 lb/hp-hr}) \times (325 \text{ hp}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 9.36 \text{ ton}$$

**CO Emissions**

$$(5.73E-3 \text{ lb/hp-hr}) \times (325 \text{ hp}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 8.19 \text{ ton}$$



### VOC Emissions

$$(2.47\text{E-}3 \text{ lb/hp-hr}) \times (325 \text{ hp}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 3.52 \text{ ton}$$

### 3.1.3 Emission Point P3 – Two 400 TPH Portable Screens

This category includes emissions produced by the two portable screens at a maximum capacity of 400 TPH each. Piling factors are included in the fugitive section.

#### *Emission Factors:*

The source for each emission factor is summarized below.

<b>Emission Factors for Screening (controlled)</b>		
PM	0.0022 lb/ton	AP-42 11.19.2-2 (08/04) Crushed Stone Processing and Pulverized Mineral Processing
PM <sub>10</sub>	0.00074 lb/ton	AP-42 11.19.2-2 (08/04) Crushed Stone Processing and Pulverized Mineral Processing
PM <sub>2.5</sub>	0.00005 lb/ton	AP-42 11.19.2-2 (08/04) Crushed Stone Processing and Pulverized Mineral Processing

#### *Control Method*

Emissions will be controlled by the use of reasonable precautions (water spray, etc.) to minimize emissions. Per MDEQ standard practice, the controlled factors were used to take reasonable precaution requirements into account.

#### *Example Emission Calculation*

##### PM Emissions

$$(0.0022 \text{ lb /ton}) \times (2) \times (400 \text{ ton/hr}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 7.71 \text{ ton}$$

##### PM<sub>10</sub> Emissions:

$$(0.00074 \text{ lb /ton}) \times (2) \times (400 \text{ ton/hr}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 2.59 \text{ ton}$$

##### PM<sub>2.5</sub> Emissions:

$$(0.00005 \text{ lb /ton}) \times (2) \times (400 \text{ ton/hr}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) \times = 0.18 \text{ ton}$$

**3.1.4 Emission Point P10A – 23 million British thermal units per hour (MMBtu/hr) Direct-fired Propane-fueled Heater**

This category includes emissions produced from stationary direct-fired propane-fueled heaters. The stationary propane-fueled heaters contribute to underground emissions from the portal and vents (the two direct-fired propane heaters, P10A and P10B are calculated at 5088 hours per year to reflect their seasonal operation). The emissions calculations are also representative of Points P10B and F28. For complete calculations, please see Appendix C.

***Emission Factors:***

The source for each emission factor is summarized below.

<b>Emission Factors for Propane-fired Heaters</b>		
PM/ PM <sub>10</sub> / PM <sub>2.5</sub>	0.7 lb/10 <sup>3</sup> gal	AP-42, Table 1.5-1 (07/08) Liquified Petroleum Gas Combustion
SO <sub>2</sub>	0.054 lb/10 <sup>3</sup> gal	AP-42, Table 1.5-1 (07/08) Liquified Petroleum Gas Combustion
NO <sub>x</sub>	13 lb/10 <sup>3</sup> gal	AP-42, Table 1.5-1 (07/08) Liquified Petroleum Gas Combustion
CO	7.5 lb/10 <sup>3</sup> gal	AP-42, Table 1.5-1 (07/08) Liquified Petroleum Gas Combustion
VOC	1 lb/10 <sup>3</sup> gal	AP-42, Table 1.5-1 (07/08) Liquified Petroleum Gas Combustion

***Control Method***

Emissions will be controlled by the use of clean fuel (propane) and good combustion practices.

***Example Emission Calculation***

PM/PM<sub>10</sub>/ PM<sub>2.5</sub> Emissions

$$(0.7 \text{ lb} / 10^3 \text{ gal}) \times (1281.33 \text{ } 10^3 \text{ gal/yr}) / (2,000 \text{ lb/ton}) \times = 0.45 \text{ ton}$$

SO<sub>2</sub> Emissions:

$$(0.054 \text{ lb} / 10^3 \text{ gal}) \times (1281.33 \text{ } 10^3 \text{ gal/yr}) / (2,000 \text{ lb/ton}) \times = 0.03 \text{ ton}$$

NO<sub>x</sub> Emissions:

$$(13 \text{ lb} / 10^3 \text{ gal}) \times (1281.33 \text{ } 10^3 \text{ gal/yr}) / (2,000 \text{ lb/ton}) \times = 8.33 \text{ ton}$$

CO Emissions:

$$(7.5 \text{ lb} / 10^3 \text{ gal}) \times (1281.33 \text{ } 10^3 \text{ gal/yr}) / (2,000 \text{ lb/ton}) \times = 4.80 \text{ ton}$$

VOC Emissions:

$$(1 \text{ lb} / 10^3 \text{ gal}) \times (1281.33 \text{ } 10^3 \text{ gal/yr}) / (2,000 \text{ lb/ton}) \times = 0.64 \text{ ton}$$

### 3.1.5 Emission Point P11 – 1.2 MMBtu/hr total Diesel-fired Heaters (three heaters 1.2 MMBtu/hr total - TEMPORARY)

This category includes emissions produced from portable diesel-fired heaters. For complete calculations, please see Appendix C.

#### *Emission Factors:*

The source for each emission factor is summarized below.

<b>Emission Factors for Diesel-fired Heaters</b>		
PM/ PM <sub>10</sub> / PM <sub>2.5</sub>	1.3 lb/10 <sup>3</sup> gal	AP-42, Table 1.5-1 (07/08) Liquified Petroleum Gas Combustion
SO <sub>2</sub>	2.13 lb/10 <sup>3</sup> gal	AP-42, Table 1.5-1 (07/08) Liquified Petroleum Gas Combustion
NO <sub>x</sub>	20 lb/10 <sup>3</sup> gal	AP-42, Table 1.5-1 (07/08) Liquified Petroleum Gas Combustion
CO	5 lb/10 <sup>3</sup> gal	AP-42, Table 1.5-1 (07/08) Liquified Petroleum Gas Combustion
VOC	0.556 lb/10 <sup>3</sup> gal	AP-42, Table 1.5-1 (07/08) Liquified Petroleum Gas Combustion

#### *Control Method*

Emissions will be controlled by the use of clean fuel (diesel) and good combustion practices.

#### *Example Emission Calculation*

PM/PM<sub>10</sub>/ PM<sub>2.5</sub> Emissions

$$(1.3 \text{ lb} / 10^3 \text{ gal}) \times (75.30 \text{ } 10^3 \text{ gal/yr}) / (2,000 \text{ lb/ton}) \times = 0.05 \text{ ton}$$

SO<sub>2</sub> Emissions:

$$(2.13 \text{ lb} / 10^3 \text{ gal}) \times (75.30 \text{ } 10^3 \text{ gal/yr}) / (2,000 \text{ lb/ton}) \times = 0.08 \text{ ton}$$

NOx Emissions:

$$(20 \text{ lb} / 10^3 \text{ gal}) \times (75.30 \times 10^3 \text{ gal/yr}) / (2,000 \text{ lb/ton}) \times = 0.75 \text{ ton}$$

CO Emissions:

$$(5 \text{ lb} / 10^3 \text{ gal}) \times (75.30 \times 10^3 \text{ gal/yr}) / (2,000 \text{ lb/ton}) \times = 0.19 \text{ ton}$$

VOC Emissions:

$$(0.556 \text{ lb} / 10^3 \text{ gal}) \times (75.30 \times 10^3 \text{ gal/yr}) / (2,000 \text{ lb/ton}) \times = 0.02 \text{ ton}$$

### 3.1.6 Emission Point P12 – Jaw Crusher Building/Dust Collector

This category includes emissions enclosed and vented through dust collector/fabric filter baghouses. The calculations are also representative of Points P13A, P13B, P14, P15, P16A, and P16B. The dust collector/fabric filter baghouse flow rate varies based on the specific installation. These emissions represent filterable-only particulate emissions. For complete calculations, please see Appendix C.

#### *Emission Factors:*

The source for each emission factor is summarized below.

Emission Factors for Jaw Crusher Building/Dust Collector		
PM/ PM <sub>10</sub> / PM <sub>2.5</sub>	0.01 gr/dscf	BACT Determination

#### *Control Method*

Emissions will be controlled by the use of the dust collector/fabric filter baghouse.

#### *Example Emission Calculation*

PM/PM<sub>10</sub>/ PM<sub>2.5</sub> Emissions

$$(0.01 \text{ gr} / \text{dscf}) \times (8500 \text{ scfm}) / (7000 \text{ gr/lb}) \times (60 \text{ min/hr}) \times (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) = 3.19 \text{ ton}$$

### 3.1.7 Emission Point UG Explosives - ANFO

This category includes emissions produced by explosives used for the mining operation. At full production, Tintina plans to use 8.5 blasts per day, worst case, with 0.5 tons of ANFO per blast and a horizontal blast area of 289 ft<sup>2</sup>.

#### *Emission Factors:*

The source for each emission factor is summarized below.

<b>Emission Factors for Explosives</b>		
PM	0.069 lb/blast	AP-42 11.9-1 Western Surface Coal Mining
PM <sub>10</sub>	0.036 lb/blast	AP-42 11.9-1 (PM <sub>10</sub> /PM scaling factor = 0.52)
PM <sub>2.5</sub>	0.002 lb/blast	AP-42 11.9-1 (PM <sub>2.5</sub> /PM scaling factor = 0.03)
NO <sub>2</sub>	17 lb/ton ANFO	AP-42 13.3 Explosives Detonation, Table 13.3-1 (2/1980) for ANFO (ammonium nitrate with 5.8-8% fuel oil)
CO	67 lb/ton ANFO	AP-42 13.3 Explosives Detonation, Table 13.3-1 (2/1980) for ANFO (ammonium nitrate with 5.8-8% fuel oil)
SO <sub>2</sub>	2 lb/ton ANFO	AP-42 13.3 Explosives Detonation, Table 13.3-1 (2/1980) for ANFO (ammonium nitrate with 5.8-8% fuel oil)

### ***Control Method***

Explosive use is a fugitive source of emissions. Emission controls will be the use of best operating practices to minimize emissions. To be conservative, no emissions control was assumed for emissions calculation.

### ***Example Emission Calculation***

#### **PM Emissions**

$$(0.069 \text{ lb/blast}) \times (8.5 \text{ blasts/day}) \times (365 \text{ days/yr}) / (2,000 \text{ lb/ton}) = 0.11 \text{ ton}$$

#### **PM<sub>10</sub> Emissions**

$$(0.036 \text{ lb/blast}) \times (8.5 \text{ blasts/day}) \times (365 \text{ days/yr}) / (2,000 \text{ lb/ton}) = 0.06 \text{ ton}$$

#### **PM<sub>2.5</sub> Emissions**

$$(0.002 \text{ lb/blast}) \times (8.5 \text{ blasts/day}) \times (365 \text{ days/yr}) / (2,000 \text{ lb/ton}) = 0.00 \text{ ton}$$

#### **SO<sub>2</sub> Emissions**

$$(2 \text{ lb /ton}) \times (8.5 \text{ blasts/day}) \times (0.5 \text{ ton ANFO/blast}) \times (365 \text{ days}) / (2,000 \text{ lb/ton}) = 1.55 \text{ ton}$$

#### **NO<sub>x</sub> Emissions**

$$(17 \text{ lb /ton}) \times (8.5 \text{ blasts/day}) \times (0.5 \text{ ton ANFO/blast}) \times (365 \text{ days}) / (2,000 \text{ lb/ton}) = 13.19 \text{ ton}$$

## CO Emissions

$$(67 \text{ lb /ton}) \times (8.5 \text{ blasts/day}) \times (0.5 \text{ ton ANFO/blast}) \times (365 \text{ days}) / (2,000 \text{ lb/ton}) \\ = 51.97 \text{ ton}$$

### 3.1.8 Emission Point UG Mobile Sources (non-regulatory)

The emissions for mobile sources in underground use are calculated only for the purpose of quantifying emissions exiting from the portal and two exhaust vents, which are relevant for the ambient air quality demonstration. These emissions do not appear in the emissions summary tables in Section 3 because of their non-regulatory nature, but are detailed in Appendix C. While these emissions are not subject to permitting, they are included because they contribute to emissions exiting the mine vents and portal. Accordingly, the underground mobile source emissions, are calculated pursuant to EPA mobile source modeling guidelines. Fugitive emissions from the movement of mobile sources in the underground mine will be negligible due to the high moisture content of traveled surfaces underground, low wind speeds underground, and containment in the mine.

All mobile source emissions were calculated based on engine category data, manufacturer's Tier 3 certifications, MOBILE6 (an EPA mobile source emissions estimation tool), and engineering estimates where appropriate. Sulfur content in diesel fuel was based on the EPA requirements for 15 ppm (which became effective in 2007). Emissions were based on the estimated daily operating schedule of each piece of equipment. An average engine load factor representative of each piece of equipment was taken from background documentation from EPA's NONROAD2008a emissions inventory model (<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P10081RV.pdf>). The NONROAD model was developed by EPA to calculate air emissions from nonroad sources including mobile construction equipment. Specifically, the file ACTIVITY.DAT, from which the NONROAD model pulls average load factor data by equipment type, was consulted. For each piece of diesel construction equipment proposed at the BBCP, an average engine load factor for an identical or representative source description in ACTIVITY.DAT was utilized. The selection of these load factors is presented in Appendix C, and equipment-specific load factors are also shown in the detailed emissions calculations. In addition, an equipment availability factor of 67.29% was developed by Tintina. The derivation of the availability factor, which accounts for equipment maintenance, downtime, and other factors, is described in the detailed emissions calculation sheets. The full calculations are available in Appendix C.

### 3.1.9 Fugitive Emissions F1-5, 29 and 30: Access Roads

This category includes fugitive particulate emissions produced by vehicle travel on permanent unpaved access roads and provides example calculations for the general category.

#### *Emission Factors:*

Fugitive dust emissions were calculated using equations Eq. (1a) and Eq. (2) and factors provided in AP-42 Chapter 13.2.2 (11/06), Unpaved Roads.

Emission Factor =  $[(k)(s/12)^a(W/3)^b][(365-P)/365] + EF_{\text{equipment wear}}$  lb/vehicle miles traveled (VMT)

k = particle size multiplier  
 = 4.9 for PM (<30 μm)  
 = 1.5 for PM<sub>10</sub>  
 = 0.15 for PM<sub>2.5</sub>

s = surface material silt content (%)  
 = 4.8%, AP-42 Table 13.2.2-1 sand & gravel plant road

a = empirical exponent  
 = 0.7 for PM (<30 μm),  
 = 0.9 for PM<sub>10</sub> and PM<sub>2.5</sub>

W = mean vehicle weight (tons)  
 = 57.5 tons, estimate based on 40-ton payload (77.5 loaded weight) and 34,000 kg (37.5-ton) empty trucks – this is the average weight

b = empirical exponent  
 = 0.45 for PM (<30 μm), PM<sub>10</sub> and PM<sub>2.5</sub>

P = number of days in year with at least 0.01 inches of precipitation  
 = 88 days, the minimum annual number of days with at least 0.01 inches of precipitation, based on site meteorological data from 2013 through 2017; the minimum number of days occurred in 2013

EF<sub>equipment wear</sub> = Emission factor for 1980s vehicle fleet exhaust, brake wear, and tire wear, AP-42 Table 13.2.2-4  
 = 0.00047 lb/VMT for PM (<30 μm)  
 = 0.00047 lb/VMT for PM<sub>10</sub>  
 = 0.00036 lb/VMT for PM<sub>2.5</sub>

Emission Factor for PM (<30 μm) =  $[(4.9)(4.8/12)^{0.7}(57.5/3)^{0.45}][(365-88)/365] + 0.00047$   
 = 7.39 lb/VMT

Emission Factor for PM<sub>10</sub> =  $[(1.5)(4.8/12)^{0.9}(57.5/3)^{0.45}][(365-88)/365] + 0.00047$  =  
 1.89 lb/VMT

Emission Factor for PM<sub>2.5</sub> =  $[(0.15)(4.8/12)^{0.9}(57.5/3)^{0.45}][(365-88)/365] + 0.00036$  =  
 0.19 lb/VMT

Emission Factors for Travel on Access Roads		
PM (<30 μm)	7.39 lb/VMT	AP-42 13.2.2 Unpaved Roads (11/06) Eq. (1a) and Eq. (2)
PM <sub>10</sub>	1.89 lb/VMT	AP-42 13.2.2 Unpaved Roads (11/06) Eq. (1a) and Eq. (2)
PM <sub>2.5</sub>	0.19 lb/VMT	AP-42 13.2.2 Unpaved Roads (11/06) Eq. (1a) and Eq. (2)

**Activity Level:**

An activity level in terms of vehicle miles traveled per year was calculated based on an estimated average number of vehicles per day and the estimated average distance traveled during different phases of the project. Years with similar activity level were grouped to estimate annual average fugitive emissions from road dust as shown below.

Year Range	Number of Years	Annual Average VMT/day
0-1	1	219.5
1-2	1	79.6
2-15, inclusive	14	29.6
16-17	2	108.9
18	1	17.3

### *Control Method*

Water spray and/or chemical dust suppressants will be used to control fugitive dust emissions from unpaved roads. A 50% control factor for fugitive dust was used in the emission calculations based on a conservative estimate given the information regarding water and chemical dust suppressants in Section 13.2.2.3 of AP-42.

### *Example Emission Calculation*

PM Emissions for Inventory Years 0 - 1:

$$(7.39 \text{ lb PM/VMT}) \times (219.5 \text{ VMT/day}) \times (365 \text{ day/year}) / (2,000 \text{ lb/ton}) \times (1 - 0.5) = 148.6 \text{ ton/year}$$

PM<sub>10</sub> Emissions for Inventory Years 0 - 1:

$$(1.89 \text{ lb PM}_{10}/\text{VMT}) \times (219.5 \text{ VMT/day}) \times (365 \text{ day/year}) / (2,000 \text{ lb/ton}) \times (1 - 0.5) = 37.9 \text{ ton/year}$$

PM<sub>2.5</sub> Emissions for Inventory Year 0 - 1:

$$(0.19 \text{ lb PM}_{2.5}/\text{VMT}) \times (219.5 \text{ VMT}) \times (365 \text{ day/year}) / (2,000 \text{ lb/ton}) \times (1 - 0.5) = 3.8 \text{ ton/year}$$

### **3.1.10 Fugitive Emissions F6, F8-10, F12-13, F15-16, F19, and F25: Material Removal, Loading, and Dumping**

This category estimates emissions produced during land clearing and removal of the topsoil, subsoil, and material beneath the soil layer for mine development, loading of this material into trucks, and deposition of material onto storage piles. This category also includes emissions generated during mine site reclamation. Materials are returned to disturbed sites by collecting material from the storage pile, loading the material into trucks, and depositing the material at the site of reclamation. These emissions occur during mine development (mine operating years 0 to 1.5; F6, F8, F10, F13, F16), WRS pad



reclamation (year 3; F25), and during mine reclamation (years 16 through 18; F9, F12, F15, F19).

**Emission Factors:**

For each ton of topsoil, subsoil, and other earthen surface materials (assumed to have the same physical properties for purposes of fugitive dust emission estimates and thus collectively referred to as “soil”) moved, fugitive dust emissions are generated at each of the following steps: 1) as the soil is removed from an area by bulldozing/scraping, 2) as the soil is loaded into a truck for transport, 3) as the soil is dumped onto a storage pile. Emissions due to soil removal are estimated using the bulldozing overburden equation in Chapter 11.9 of AP-42, Western Surface Coal Mining (10/98), Table 11.9-1 (Table 11.9-3 lists acceptable parameter ranges for the equations in Table 11.9-1).

Emissions due to soil loading and unloading, also referred to as “drop operations,” are estimated using equation 1 from AP-42 Chapter 13.2.4, Aggregate Handling and Storage Piles (11/06), as directed by AP-42 Chapter 13.2.3, Heavy Construction Operations (1/95), Table 13.2.3-1, row II.5 Loading of excavated material into trucks and row II.6. Truck dumping of fill material, road base, or other materials.

Soil Removal Emission Factors (AP-42 Table 11.9-1, bulldozing overburden)

$$PM \text{ (Total Suspended Particulate, TSP)} = (5.7)(s)^{1.2} / (M)^{1.3}$$

$$PM_{10} = 0.75*(1.0)(s)^{1.5}/(M)^{1.4}$$

$$PM_{2.5} = 0.105* (5.7)(s)^{1.2} / (M)^{1.3}$$

Where:

s = material silt content, %

= 6.9% per AP-42 Table 11.9-3

M = material moisture content, %

= 3.4% per AP-42 Table 13.2.4-1, western surface coal mining exposed ground mean moisture content – this is a reasonable approximation for the soil moisture content at the mine site.

$$\text{Emission Factor for PM (TSP)} = (5.7)(6.9)^{1.2} / (3.4)^{1.3} = 11.792 \text{ lb/hr}$$

$$\text{Emission Factor for PM}_{10} = 0.75*(1.0)(6.9)^{1.5}/(3.4)^{1.4} = 2.451 \text{ lb/hr}$$

$$\text{Emission Factor for PM}_{2.5} = 0.105* (5.7)(6.9)^{1.2} / (3.4)^{1.3} = 1.238 \text{ lb/hr}$$

<b>Emission Factors for Soil Removal Operations</b>		
PM (TSP)	11.792 lb/hr	AP-42 11.9 Western Surface Coal Mining (10/98), Table 11.9-1, bulldozing overburden
PM <sub>10</sub>	2.451 lb/hr	
PM <sub>2.5</sub>	1.238 lb/hr	

Drop Operations Emission Factors (AP-42, Chapter 13.2.4 Equation 1)

$$\text{Emission Factor} = (k)(0.0032)(U/5)^{1.3}/(M/2)^{1.4} \text{ lb/ton of material handled}$$

Where:

- k = particle size multiplier
  - = 0.74 for PM (<30 μm)
  - = 0.35 for PM<sub>10</sub>
  - = 0.053 for PM<sub>2.5</sub>
- U = mean wind speed (miles per hour)
  - = 9.3 miles per hour, standard windspeed for MT per MDEQ
- M = material moisture content, %
  - = 3.4% per equation maximum value (per AP-42 Table 13.2.4-1, western surface coal mining exposed ground mean moisture content – this is a reasonable approximation for the soil moisture content at the mine site)

Emission Factor for PM (<30 μm) = (0.74)(0.0032)(9.3/5)<sup>1.3</sup>/(3.4/2)<sup>1.4</sup> = 0.00252 lb/ton  
 Emission Factor for PM<sub>10</sub> = (0.35)(0.0032)(9.3/5)<sup>1.3</sup>/(3.4/2)<sup>1.4</sup> = 0.00119 lb/ton  
 Emission Factor for PM<sub>2.5</sub> = (0.053)(0.0032)(9.3/5)<sup>1.3</sup>/(3.4/2)<sup>1.4</sup> = 0.00018 lb/ton

Emission Factors for Soil Loading and Dumping		
PM (<30 μm)	0.00252 lb/ton soil	AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06)
PM <sub>10</sub>	0.00119 lb/ton soil	
PM <sub>2.5</sub>	0.00018 lb/ton soil	

Total Emissions for Soil Removal Operations

The total emissions for soil removal operations are calculated as the emissions from soil removal, which are based on hours of operation, plus the emissions from the drop operations, which are based on the mass of soil loaded (1 drop) and the mass of soil dumped (1 drop).

Total soil removal emissions (ton/yr) = [EF<sub>soil removal</sub> (lb/hr) \* operating hours (hr/yr) + 2 drops \* EF<sub>drop operations</sub> (lb/ton) \* mass of soil removed (ton/yr)] / 2,000 (lb/ton)

**Activity Level:**

The activity level in terms of tons of topsoil, subsoil, and other earthen surface materials removed and stockpiled was estimated based on the amount of material removed as part of mine construction at the portal pad, the CWP, the copper-enriched ore stockpile, the WRS pad, the mill pad, the PWP, the CTF, the NWCR, the temporary powder storage area, and the foundation drain ponds. An example emission calculation is shown for topsoil removal and is based on a total of 622,332 tons of soil scraped, loaded and dropped in the first year of mine development.

For each fugitive emission source, the year in which emissions are highest (i.e., the year in which the most material is moved) is the year used to estimate emissions across the time period during which the emissions generating activity occurs. For example, emissions generated during topsoil return for mine reclamation were calculated based on a total annual process rate of 516,799 tons of soil collected, loaded and dropped during

mine operating year 17. The rate of soil return during years 16 and 18 is much less; using year 17 to estimate soil return emissions for all three years conservatively estimates emissions.

***Control Method:***

Handling and transfer of soils and other earthen materials are a source of fugitive emissions. Emissions will be controlled using best operating practices to minimize emissions. Conservatively, no emissions control was assumed for the emissions calculation.

***Example Emission Calculation:***

Total soil removal emissions (ton/yr) = [EF<sub>soil removal</sub> (lb/hr) \* operating hours (hr/yr) + 2 drops \* EF<sub>drop operations</sub> (lb/ton) \* mass of soil removed (ton/yr)] / 2,000 (lb/ton)

PM Emissions for Inventory Year 0-1:

[(11.792 lb PM/hr x 10 hr/day x 365 day/yr) + (0.00252 lb PM/ton x 622,332 ton/yr x 2 drops)] / [2,000 lb/ton] x (1- 0.00) = 27.39 ton/yr

PM<sub>10</sub> Emissions for Inventory Year 0-1:

[(2.451 lb PM<sub>10</sub>/hr x 10 hr/day x 365 day/yr) + (0.00119 lb PM<sub>10</sub>/ton x 622,332 ton/yr x 2 drops)] / [2,000 lb/ton] x (1- 0.00) = 6.11 ton/yr

PM<sub>2.5</sub> Emissions for Inventory Year 0-1:

[(1.238 lb PM<sub>2.5</sub>/hr x 10 hr/day x 365 day/yr) + (0.00018 lb PM<sub>2.5</sub>/ton x 622,332 ton/yr x 2 drops)] / [2,000 lb/ton] x (1- 0.00) = 2.82 ton/yr

**3.1.11 Fugitive Emissions F7, F11, F14, F17-18, F21, and F24: Storage Piles**

This category includes emissions produced by wind erosion of material storage piles.

***Emission Factors:***

Emission factors for wind erosion are based on the calculations described in AP-42 Chapter 13.2.5 Industrial Wind Erosion.

The height to base ratio of each pile is less than 0.2, so each pile can be assumed to be flat. This allows the erosion potential to be calculated for a single geometry versus, for example, a conical pile, which has distinct subareas subject to different rates of erosion.

A daily erosion potential, P<sub>daily</sub>, is calculated as follows using equation 3 from AP-42 Chapter 13.2.5:

$$P_{daily} \left( \frac{g}{m^2 \cdot event} \right) = \begin{cases} 58 (u^* - u_t^*)^2 + 25(u^* - u_t^*) \\ 0 \text{ for } u^* \leq u_t^* \end{cases}$$

Where:

$P_{\text{daily}}$  = daily erosion potential, grams per meter squared per material disturbance event

$u^*$  = friction velocity, m/s, estimated per the discussion below

$u_t^*$  = threshold friction velocity, m/s, from AP-42 Table 13.2.5-2

The daily erosion potential is multiplied by the number of daily disturbance events and summed over a year to calculate an annual erosion potential. The annual erosion potential is then used to estimate the annual rate of material erosion from stockpiles. The steps and assumptions involved in this estimation follow.

A maximum daily 1-hour average windspeed,  $u$ , is used to calculate the friction velocity,  $u^*$ . Windspeeds were measured and recorded at an onsite meteorological station, which has collected data from mid-2012 through 2017. Year 2013 daily windspeed data was chosen to estimate wind erosion because the highest hourly windspeed was recorded that year. Year 2016 data was also chosen for comparison because it is the most recent complete year of data available for the site. Two years of daily erosion potentials,  $P_{\text{daily}}$ , were developed from the windspeed data in order to create a complete, conservative set of annual daily erosion potentials. The calculated  $P_{\text{daily}}$  for each calendar day in 2013 was compared to  $P_{\text{daily}}$  for the corresponding calendar day in 2016, and the largest erosion potential was selected as the  $P_{\text{daily}}$  for that calendar day.

The equation to calculate the daily erosion potential,  $P_{\text{daily}}$ , contains the friction velocity,  $u^*$  (m/s), and the threshold friction velocity,  $u_t^*$  (m/s). Friction velocity,  $u^*$ , is calculated as follows:

$$u^* = 0.053 \times u^{+10} \text{ (equation 4, AP-42 Ch. 13.2.5)}$$

Where the fastest mile of wind at a reference anemometer height 10 meters,  $u^{+10}$  (m/s), is calculated as follows:

$$u^{+10} = 1.35 \times u \text{ (maximum 1-hour average windspeed)}$$

The conversion factor of 1.35 is derived from the table “Wind Speed Conversions (Normative)” in Annex L of *TIA Standard Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2*, ANSI/TIA-222-G-2-2009, December 2009. This table lists the fastest mile windspeed in miles per hour and the hourly mean windspeed also in miles per hour. The ratio of each fastest mile windspeed and its associated hourly mean windspeed was calculated. The average ratio is 1.30, the minimum ratio 1.18, and the maximum ratio is 1.35. To be conservative, the maximum ratio was used to multiply the hourly average windspeed to obtain an estimate of the fastest mile windspeed.

The threshold friction velocity,  $u_t^*$  (m/s), for different materials is given in AP-42 Table 13.2.5-2. Materials stored at the Black Butte Copper Project were estimated to have

properties similar to either western surface coal mine overburden ( $u_t^* = 1.02$  m/s) or uncrusted coal pile ( $u_t^* = 1.12$  m/s).

The friction velocity is often lower than the threshold velocity (i.e.,  $u^* \leq u_t^*$ ), thus there are many calendar days for which the erosion potential is equal to zero (see equation for  $P_{\text{daily}}$  above). For calendar days in which the friction velocity of wind exceeds the threshold velocity, a value for  $P_{\text{daily}}$  is generated and is used to calculate the annual erosion potential.

The annual erosion potential,  $P$  ( $\text{g}/\text{m}^2/\text{year}$ ), is estimated by multiplying the number of stockpiled material disturbance events that occur in a day by the daily erosion potential calculated for a particular calendar day,  $P_{\text{daily}}$  ( $\text{g}/\text{m}^2/\text{disturbance event}$ ), and then summing the estimated daily emissions over a calendar year:

$$P \left( \frac{\text{g}}{\text{m}^2 \cdot \text{year}} \right) = \sum_{P_{\text{daily}}=P_{\text{daily on day 1}}}^{P_{\text{daily}}=P_{\text{daily on day 365}}} P_{\text{daily}} \left( \frac{\text{g}}{\text{m}^2 \cdot \text{event}} \right) * 20 \frac{\text{hr}}{\text{day}} * 1 \frac{\text{event}}{\text{hr}}$$

When a threshold friction velocity of 1.02 m/s (AP-42, Table 13.2.5-2, overburden) is used, the sum of daily erosion potentials equals 8.68  $\text{g}/\text{m}^2/\text{daily events}^3$  and  $P$  is as follows:

$$\begin{aligned} P \left( \frac{\text{g}}{\text{m}^2 \cdot \text{year}} \right) &= 8.68 \left( \frac{\text{g}}{\text{m}^2 \cdot \text{daily events}} \right) * 20 \frac{\text{daily events}}{\text{year}} = 173.54 \left( \frac{\text{g}}{\text{m}^2 \cdot \text{year}} \right) \\ &= 0.383 \left( \frac{\text{lb}}{\text{m}^2 \cdot \text{year}} \right) = 1.91E - 04 \left( \frac{\text{ton}}{\text{m}^2 \cdot \text{year}} \right) \end{aligned}$$

When a threshold friction velocity of 1.12 m/s (AP-42, Table 13.2.5-2, uncrusted coal pile) is used, the sum of daily erosion potentials equals 1.69  $\text{g}/\text{m}^2/\text{daily events}^4$  and  $P$  is as follows:

$$\begin{aligned} P \left( \frac{\text{g}}{\text{m}^2 \cdot \text{year}} \right) &= 1.69 \left( \frac{\text{g}}{\text{m}^2 \cdot \text{daily events}} \right) * 20 \frac{\text{daily events}}{\text{year}} = 33.77 \left( \frac{\text{g}}{\text{m}^2 \cdot \text{year}} \right) \\ &= 0.074 \left( \frac{\text{lb}}{\text{m}^2 \cdot \text{year}} \right) = 3.72E - 05 \left( \frac{\text{ton}}{\text{m}^2 \cdot \text{year}} \right) \end{aligned}$$

The annual emission rate for particulate matter is then estimated as follows:

$$ER \left( \frac{\text{ton}}{\text{yr}} \right) = P \left( \frac{\text{ton}}{\text{m}^2 \cdot \text{yr}} \right) * A(\text{m}^2) * (1 - \text{control efficiency}) * k$$

<sup>3</sup> Please refer to the Emission Inventory calculation spreadsheet, Topsoil pile worksheet, for the data table used to calculate this value.

<sup>4</sup> Please refer to the Emission Inventory calculation spreadsheet, Cu-rock pile worksheet, for the data table used to calculate this value.

Where:

- ER = emission rate, ton/year
- P = erosion potential converted to units of tons per meter squared per year – this varies based on the threshold friction velocity used  
 = 1.91E-04 ton/(m<sup>2</sup> year), based on a threshold friction velocity of 1.02 m/s for overburden (Table 13.2.5-2); used for topsoil, subsoil, and excess material storage piles N and S  
 = 3.72E-05 ton/(m<sup>2</sup> year), based on a threshold friction velocity of 1.12 m/s for uncrusted coal pile (Table 13.2.5-2); used for copper-enriched ore and waste rock storage piles
- A = disturbance area in m<sup>2</sup> – conservatively assumed to be 36 m<sup>2</sup> per event  
 Control efficiency is assumed to be 50%, as the material stockpiles will be watered as necessary and revegetated if possible
- k = particle size multiplier, AP-42, page 13.2.5-3  
 = 1.0 for PM  
 = 0.5 for PM<sub>10</sub>  
 = 0.075 for PM<sub>2.5</sub>

The estimated annual emission rate of fugitive dust from each stockpile is shown below.

<b>Emission Rates for Storage Piles</b>				
<b>Material Stockpile</b>	<b>Threshold Friction Velocity, u<sub>t</sub>* (m/s)</b>	<b>PM (TSP) (ton/yr)</b>	<b>PM<sub>10</sub> (ton/yr)</b>	<b>PM<sub>2.5</sub> (ton/yr)</b>
Temporary Construction Stockpile Excess Reclamation Stockpile South Excess Reclamation Stockpile North Topsoil Stockpile Subsoil Stockpile	1.02	3.44E-03	1.72E-03	2.58E-04
Copper-Enriched Rock Stockpile Waste Rock Storage Stockpile	1.12	6.70E-04	3.35E-04	5.03E-05

### **3.1.12 Fugitive Emissions F20, F22 and F24: Mined Material Drop Operations**

This category estimates emissions produced during the deposition of mined material into piles (F20 and F22), and mined material dropped into the CTF for road construction (F24).

#### ***Emission Factors:***

Emission factors for mined material drop operations are given in AP-42, Chapter 11.24 Metallic Mineral Processing (8/82), Table 11.24-2 High Moisture Ore – Material Handling & Transfer – All Materials Except Bauxite.

Emission Factors for Mined Material Drop Operations		
PM (TSP)	0.01 lb/ton	AP-42 11.24 Metallic Mineral Processing (8/82), Table 11.24-2
PM <sub>10</sub>	0.004 lb/ton	
PM <sub>2.5</sub>	0.004 lb/ton	

**Activity Level:**

The activity level in terms of tons of mined material dropped was estimated based on mine production estimates.

**Control Method:**

Handling and transfer of mined material is a source of fugitive emissions. Emissions are expected to be low due to the moisture content of the material and the low amount of fine particles in the material. No emissions control was assumed for the emissions calculation.

**Example Emission Calculation:**

Total mined material drop operation emissions (ton PM/yr) =  $EF_{\text{material drop}} \text{ (lb PM/ton)} * \text{mass production rate (ton/yr)} * 1 \text{ drop} / 2,000 \text{ (lb PM/ton PM)}$

PM Emissions for Copper-Enriched Rock Drop to Stockpile, Year 3 (highest rate over years 2 to 3):

$$[0.01 \text{ (lb PM/ton)} * (63,571 \text{ ton/yr)} * 1 \text{ drop}] / [2,000 \text{ lb/ton}] * (1 - 0.00) = 0.32 \text{ ton/yr}$$

PM<sub>10</sub> Emissions for Copper-Enriched Rock Drop to Stockpile, Year 3 (highest rate over years 2 to 3):

$$[0.004 \text{ (lb PM/ton)} * (63,571 \text{ ton/yr)} * 1 \text{ drop}] / [2,000 \text{ lb/ton}] * (1 - 0.00) = 0.32 \text{ ton/yr}$$

PM<sub>2.5</sub> Emissions for Copper-Enriched Rock Drop to Stockpile, Year 3 (highest rate over years 2 to 3):

$$[0.004 \text{ (lb PM/ton)} * (63,571 \text{ ton/yr)} * 1 \text{ drop}] / [2,000 \text{ lb/ton}] * (1 - 0.00) = 0.32 \text{ ton/yr}$$

**3.1.13 Emission Point F27 – Gasoline Storage Tank (double-walled 500 gallon)**

Emissions for this tank were calculated using the EPA TANKS4.09d program. See Appendix C for details.

**3.2 Hazardous Pollutant Emission Inventory**

Total hazardous air pollutant (HAPs) emissions for diesel fuel combustion for the mobile (mobile sources are not subject to permitting but are included to provide a highly conservative estimate), stationary, and portable equipment were estimated using data from AP-42 Chapter 3.4 and total diesel fuel combusted. Calculations were based on maximum diesel fuel required for both surface and underground operations, the maximum appears in years 4-13 of operation).

Emission factors for HAPs were obtained from AP-42, Chapter 3.3 for Gasoline and Diesel Industrial Engines.

<b>Emission Factors for Diesel-fired Mobile/Portable/Stationary Equipment</b>		
Total HAPs	3.87 E-03 lb/MMBtu	AP-42 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-2 (10/1996)

***Activity Level:***

An activity level in terms of fuel used was provided by Tintina of 8,363 liters of diesel used per day. The amount of fuel used each year was converted from a gal/yr basis to an MMBtu/yr basis using a diesel heat content of 0.137 MMBtu/gal found in AP-42, Appendix A.

Fuel Usage Years 4 - 13 (MMBtu/yr) = 806,384 gal/yr x (0.137 MMBtu/gal) = 110,474 MMBtu

***Control Method:***

Emissions produced by diesel-fired mobile, portable and stationary equipment are considered fugitive sources of emissions. No additional control is assumed for this source.

***Example Emission Calculation:***

HAPs Emissions for Years 4-13 (per year, worst case fuel usage):  
 $(0.00387 \text{ lb HAPs/MMBtu}) \times (110,474 \text{ MMBtu}) / (2,000 \text{ lb/ton}) \times (1 - 0.00) = 0.21 \text{ tons/year}$

In addition, trace metals are present in ore, tailings, and concentrate. During mining, handling, and processing of these materials, emissions of these metals, some of which are identified as HAPs, may occur as a fraction of the particulate emitted from these operations. The primary trace metals found in the BBCP soil<sup>5</sup> are arsenic, cadmium, copper, lead, and zinc (copper and zinc are not included on EPA's HAPs list under Section 112 of the Clean Air Act and are not discussed further). Using double MDEQ's Background Threshold Values (to provide a conservative estimate, several samples were higher, but the majority did not meet the Background Threshold Value on the mine site) for soils for arsenic, cadmium, and lead, the milligram/kilogram (mg/kg of soil) total would be 106 milligrams per kilogram of soil. The Background Threshold Values for arsenic, cadmium, and lead are 22.5, 0.7, and 29.8 mg/kg, respectively. Doubling their sum would be 106 mg/kg. Converting that to a lb/ton emission factor of the particulates emitted site-wide, would be 0.212 lb/ton. Multiplying that factor times the amount of particulate emitted

<sup>5</sup> Tintina Mine Operating Permit Application, Revision 3, July 14, 2017, Appendix E – Baseline Soils Report



site-wide would be 0.212 lb/ton x 320 tons of particulate emitted on an annual basis (both development/production and point/fugitive combined), with a result of 0.03 tons per year.

As a result, the total amount of HAPs emitted from the fuel and processing would be 0.24 tons per year, below the 25 tons/year for total HAPs, and 10 tons/year per individual HAP for major source thresholds. Tintina will be classified as an area source with respect to HAPs.

### 3.3 Greenhouse Gas Emissions Inventory

This category includes GHG emissions produced by diesel-fired mobile, portable and stationary equipment (calculations were based on maximum diesel fuel required for both surface and underground operations; the maximum appears in years 4-13 of operation).

***Emission Factors:***

Emission factor for CO<sub>2</sub> (other GHG emissions are anticipated to be negligible, AP-42 states this factor assumes 99% conversion to CO<sub>2</sub>) was obtained from AP-42, Chapter 3.3 for Gasoline and Diesel Industrial Engines.

<b>Emission Factors for Diesel-fired Mobile/Portable/Stationary Equipment</b>		
CO <sub>2</sub>	164 lb/MMBtu	AP-42 3.4 Gasoline and Diesel Industrial Engines, Table 3.3-1 (10/1996)

***Activity Level:***

An activity level in terms of fuel used was provided by Tintina of 8,363 liters of diesel used per day. The amount of fuel used each year was converted from a gal/yr basis to an MMBtu/yr basis using a diesel heat content of 0.137 MMBtu/gal found in AP-42, Appendix A.

Fuel Usage Years 4 - 13 (MMBtu/yr) = 806,384 gal/yr x (0.137 MMBtu/gal) = 110,474 MMBtu

***Control Method:***

Emissions produced by diesel-fired mobile, portable and stationary equipment are considered fugitive sources of emissions. No additional control is assumed for this source.

***Example Emission Calculation:***

GHG Emissions for Years 4-13 (per year, worst case fuel usage):  
 (164 lb CO<sub>2</sub>/MMBtu) x (110,474 MMBtu) / (2,000 lb/ton) x (1 - 0.00) = 9,058.92 ton/year

## 4.0 REGULATORY ANALYSIS

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This section evaluates potentially applicable regulatory requirements for Tintina under both Montana and federal air quality regulations. Table 4-1 lists requirements that may apply to the proposed project. Analyses of each of the listed regulations follow.

**Table 4-1: Potentially Applicable Rules**

<b>Rule Citation</b>	<b>Description</b>	<b>Report Section</b>
ARM 17.8 Subchapter 1	General Provisions	4.1
ARM 17.8 Subchapter 2	Ambient Air Quality Standards	4.2
ARM 17.8.304	Emission Standards - Visible Air Contaminants	4.3
ARM 17.8.340	New Source Performance Standards (40 CFR 60, Stationary Sources)	4.4
ARM 17.8.342	Emission Standards for Hazardous Air Pollutants for Source Categories (MACT – 40 CFR 63)	4.5
ARM 17.8 Subchapter 5	Air Quality Permit Application, Operation, and Open Burning Fees	4.6
ARM 17.8 Subchapter 6	Outdoor Burning	4.7
ARM 17.8 Subchapter 7	Permit, Construction and Operation of Air Contaminant Sources	4.8
ARM 17.8.752	Best Available Control Technology (BACT)	4.9
ARM 17.8 Subchapter 8	Prevention of Significant Deterioration-New Source Review	4.10
ARM 17.8 Subchapter 12	Operating Permit Program	4.11
40 CFR Parts 51, 52, 70, <i>et al.</i>	Greenhouse Gas Tailoring Rule	4.12
40 CFR 98, Subpart C	Greenhouse Gas Mandatory Reporting Rule	4.13

### 4.1 General Provisions

ARM 17.8 Subchapter 1 contains general rules that apply to the air quality program including definitions, testing requirements, malfunction notification requirements, and prohibitions against dilution or the creation of a public nuisance. Tintina will comply with all of the requirements and general provisions in ARM 17.8 Subchapter 1. Tintina will not circumvent any air quality regulation.

## 4.2 Ambient Air Quality Standards

The air quality of the area is classified as "Better than National Standards" or unclassifiable/attainment of the National Ambient Air Quality Standards (NAAQS) for criteria pollutants (40 CFR 81.327).

Section 6 of this permit application presents the results of an air dispersion/modeling analysis of potential impacts of the proposed BBCP mine on local ambient air quality. This modeling used on-site meteorological monitoring data collected from April 2012 through June 2017. On-site meteorological data continues to be collected.

## 4.3 Emission Standards

### 4.3.1 Opacity

ARM 17.8 Sections 304 and 308 limit the opacity of source emissions to no more than 20% averaged over a six-minute period. Tintina will comply with the requirements of ARM 17.8.304 and ARM 17.8.308 by using control technologies discussed in more detail in Section 5 of this application.

### 4.3.2 Particulate Matter, Fuel Burning Equipment

ARM 17.8.309 states that no new fuel burning equipment shall emit PM in excess of the amount that results from the following equation:

$$E = 1.026 * H^{-0.233}$$

where: E = Particulate Emission Rate (lbs/MMBtu)  
H = Heat Input Capacity (MMBtu/hr)

Tintina will ensure that all affected equipment complies with this limit.

### 4.3.3 Particulate Matter, Industrial Processes

ARM 17.8.310 limits PM emissions from industrial processes to the value calculated using the following formula.

$$E = 4.10 * P^{0.67} \quad (\text{process rates up to and including 30 ton/hr})$$
$$E = 55 * P^{0.11} - 40 \quad (\text{process rates greater than 30 ton/hr})$$

where:

P = Process Rate (ton/hr)  
E = Particulate matter emissions rate (pounds per hour)

Tintina will ensure that all affected equipment complies with this limit.

#### **4.4 New Source Performance Standards (40 CFR 60, Stationary Sources)**

ARM 17.8.340 incorporates by reference the New Source Performance Standards (NSPS) of 40 CFR 60. Tintina has identified two of these standards (not including the General Provisions) as potentially applying to its operations.

##### **4.4.1 NSPS – Subpart A – General Provisions**

This subpart applies to all equipment or facilities subject to a specific Part 60 subpart.

##### **4.4.2 NSPS – Subpart LL – Standards of Performance for Metallic Mineral Processing Plants**

Title 40 CFR 60, Subpart LL, Standards of Performance for Metallic Mineral Plants, applies to affected equipment that commenced construction or modification after August 24, 1982. Tintina has identified the following proposed stationary equipment as being subject to this regulation: the crushers (conical and jaw), portable screen, conveyor belt transfer points, surge bin, and enclosed storage area.

Water sprays and enclosures will control the crusher, screens, and conveyor belt transfer points within the required 7% opacity level. The remaining activities take place in buildings and/or are vented into dust collectors or fabric filter baghouses with a maximum grain loading limit more stringent than the required 0.05 grains per dry standard cubic foot for stack emissions.

##### **4.4.3 NSPS – Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE)**

Title 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, applies to stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are manufactured after April 1, 2006, and are not fire pump engines, and stationary IC ICE that undergo modification or reconstruction after July 11, 2005. Tintina will have diesel-fired portable equipment that is subject to Subpart IIII. Tintina will comply with applicable requirements for this equipment.

#### **4.5 Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAP – 40 CFR 63)**

ARM 17.8.342 incorporates by reference the National Emission Standards for Hazardous Air Pollutants (NESHAP) listed in 40 CFR Part 63 that apply to stationary sources. Tintina has identified two of these standards (not including the General Provisions) as potentially applying to its operations.

##### **4.5.1 NESHAP – Subpart A – General Provisions**

This subpart applies to all equipment or facilities subject to a specific Part 63 subpart.

#### **4.5.2 NESHAP – Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines**

Title 40 CFR 63, Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants from Stationary Reciprocating Internal Combustion Engines) applies to affected equipment at major and area sources of HAPs. The proposed BBCP will include gasoline- and/or diesel-fired portable/mobile equipment that is subject to Subpart ZZZZ. Based on the emissions estimates presented in Section 3 and Appendix C, the BBCP qualifies as an area source of emissions.

#### **4.5.3 NESHAP – Subpart CCCCCC – National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities**

Title 40 CFR 63, Subpart CCCCCC (National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities) applies to affected equipment at area sources of HAPs. The proposed BBCP will include a gasoline fuel tank in both the development and production phases of operation. Based on the emissions estimates presented in Section 3 and Appendix C, the BBCP qualifies as an area source of emissions.

#### **4.6 Stack Heights and Dispersion Techniques**

Rules governing stack heights do not physically limit the height of a given stack. Rather, the rules provide no incentive for building "tall" stacks since all analyses of BACT, modeling, etc., are based upon Good Engineering Practice (GEP) stack height or actual height, whichever is less. GEP can be determined by several different methods, but without special demonstrations, the minimum value of GEP stack height is 65 meters. All stacks at the BBCP were modeled using actual stack heights, and no stack heights proposed exceed 65 meters; therefore, the analysis complies with GEP.

#### **4.7 Air Quality Permit Application, Operation, and Open Burning Fees**

Tintina will submit the required permit application and operation fees per ARM 17.8 Subchapter 5. No outdoor burning is expected at the BBCP, so open burning fees will not apply.

#### **4.8 Outdoor Burning**

No outdoor burning is expected at the BBCP. If Tintina conducts any outdoor burning, all conditions in ARM 17.8, Subchapter 6 will be followed.

#### **4.9 Permit, Construction and Operation of Air Contaminant Sources**

According to ARM 17.8.743 and 744, the proposed project qualifies as a new stationary source for which an application for an air quality permit is required. This report, including completed permit application forms and other supporting information, constitutes Tintina's application for an MAQP. Laboratory equipment is specifically exempted by the air quality

requirements under ARM 17.8.744(1) and is not included in this analysis. Mobile sources are also specifically exempted under the same rule; however, the underground mobile source emissions are quantified for the ambient air quality demonstration because those emissions exit from the portal and exhaust vents.

One of the permit application requirements is that the applicant notify the public of its application by means of a newspaper of general circulation in the area affected by the facility modification (ARM 17.8.748). Such public notification will be served by advertisement in the weekly *Meagher County News* and the daily *Great Falls Tribune* and *Helena Independent Record* within ten days of filing the complete permit application. An affidavit of publication will be delivered to MDEQ upon receipt by Tintina.

#### **4.10 Best Available Control Technology (BACT)**

ARM 17.8.752 requires that any new or altered source requiring an air quality permit install the maximum air pollution control capability that is technically practical and economically feasible and that BACT must be utilized. Section 5 of this permit application analyzes available alternative control technologies and identifies BACT for each applicable emissions source and pollutant combination. To comply with this rule, Tintina proposes to utilize the control technologies determined through those analyses to qualify as BACT.

#### **4.11 New Source Review (NSR) and Prevention of Significant Deterioration (PSD)**

NSR/PSD regulations apply to new and modified major stationary sources. A major stationary source is one that:

- Is listed in ARM 17.8.801(22)(a)(i) and has the potential to emit more than 100 tons per year (tpy) of any pollutant subject to regulation under the Federal Clean Air Act for PSD review; or
- Is not listed but has the potential to emit (from a stationary, non-fugitive source) more than 250 tpy of any regulated pollutant.

The BBCP is a new source, is not a listed source, and does not have the potential to emit more than 250 tpy of a regulated pollutant from a stationary, non-fugitive source (see Section 3 of the application for a breakdown of fugitive and point source emissions). Therefore, the project is not a major stationary source and does not trigger the need for NSR/PSD permitting.

Because the proposed project is not subject to NSR/PSD permitting regulations, an analysis of project impacts on PSD increments is not required under ARM 17.8.820. However, a minor source, such as the BBCP, may also be required to conduct a PSD increment analysis in certain instances. Tintina has further investigated their responsibility for an analysis of increment as follows:

- The requirement to conduct an increment analysis as a minor emissions source hinges on the triggering of a “minor source baseline date” in a specific “baseline area.”
- ARM 17.8.801(21)(b) defines the minor source baseline date as “the earliest date after the trigger date on which a major stationary source or a major modification subject to 40 CFR 52.21 or to regulations approved pursuant to 40 CFR 51.166 submits a complete application under the relevant regulation.”
- ARM 17.8.801(3) defines baseline area as “any intrastate area (and every part thereof) designated as attainment or unclassifiable in 40 CFR 81.327 in which the major source or major modification establishing the minor source baseline date would construct or would have an air quality impact equal to or greater than one microgram per cubic meter ( $\mu\text{g}/\text{m}^3$ ) (annual average) of the pollutant for which the minor source baseline date is established, except baseline areas for PM-2.5 are designated when a major source or major modification establishing the minor source baseline date would construct or would have an air quality impact equal to or greater than  $0.3 \mu\text{g}/\text{m}^3$  as an annual average for PM-2.5.” MDEQ, by policy, has used county boundaries to define baseline areas.
- Tintina is proposing to construct and operate a facility in Meagher County. No major stationary source applications have been submitted to MDEQ for Meagher County, nor has the “baseline area” of the county been triggered by any actions in the surrounding counties. The baseline areas have been triggered for Cascade and Broadwater Counties, but the facilities in those counties are geographically separated from the BBCP (by the Big Belt Mountains, etc.). Thus, we conclude the BBCP is not subject to a minor source baseline increment analysis.

#### **4.12 Operating Permit Program (Title V)**

Title V of the Federal Clean Air Act amendments of 1990 sets forth operating permit requirements that apply to major sources as defined within the statute. Montana administers the statute in accordance with rules codified at ARM 17.8 Subchapter 12. Several alternative criteria establish major source status, but the primary criteria that most often trigger applicability are:

- The facility’s potential to emit any pollutant from a stationary point source is greater than 100 tpy.
- The facility’s potential to emit any single listed hazardous air pollutant (HAP) is greater than 10 tpy, or its potential to emit all HAPs combined is greater than 25 tpy.

The critical BBCP phases for emissions are the development and production phases. Because of the use of engines and other temporary equipment in the development phase, the Title V thresholds for NO<sub>x</sub> and CO are triggered during that time. Consequently, Title V operating permit program rules would apply to the proposed project. However, the production phase would be below Title V thresholds and may require reevaluation of Title V applicability later in the project life.

Pursuant to ARM 17.8.1205(2)(b), “Persons required to obtain an air quality operating permit or permit revision who are also required to obtain a Montana air quality preconstruction permit under this chapter shall file a complete application for an air quality operating permit or permit revision within 12 months after commencing operation...” Given the current status, Tintina plans file a complete application for this project within 12 months after commencing operation. Tintina will comply with all regulations in ARM 17.8, Subchapter 12.

#### **4.13 Greenhouse Gas Tailoring Rule**

In general, the GHG Tailoring Rule triggers NSR/PSD applicability for stationary sources that emit greater than 100,000 tons CO<sub>2</sub> equivalent (CO<sub>2e</sub>), or those that are already major sources and modify their facility with a resulting emissions increase greater than 75,000 tons CO<sub>2e</sub> per year. A permitting threshold of 100,000 tons CO<sub>2e</sub> from a stationary source triggers the need for a Title V Operating Permit. As shown in Section 3 – Greenhouse Gas Emissions, the BBCP’s potential GHG emissions from stationary sources will not exceed the applicable thresholds. To provide a conservative estimate, GHG emissions were calculated based on all the diesel fuel requirements (both mobile and stationary sources) for surface and underground operations. While a small amount of gasoline is used on-site, this amount would be dwarfed by the mobile source diesel requirements included in the GHG calculation (mobile sources would not be subject to these requirements). The GHG emissions calculated were far below the regulatory threshold for reporting, even including sources not subject to permitting.

#### **4.14 Greenhouse Gas Mandatory Reporting Rule**

Title 40 CFR Part 98, Subpart C requires reporting of greenhouse gas emissions from listed facilities and suppliers, as well as facilities with stationary sources that emit over 25,000 metric tons CO<sub>2e</sub> in a calendar year. Metal mines (or, more specifically, copper mines) are not listed as mandatory sources for reporting purposes. If the proposed facility’s actual annual GHG emissions due to stationary source fuel combustion surpass the applicability threshold, it will be subject to this rule. As shown in Section 3 – Greenhouse Gas Emissions, BBCP will not be subject. To provide a conservative estimate, GHG emissions were calculated based on all the diesel fuel requirements (both mobile and stationary sources) for surface and underground operations. While a small amount of gasoline is used on-site, this amount would be dwarfed by the mobile source diesel requirements included in the GHG calculation (mobile sources would not be subject to these requirements). The GHG emissions calculated were far below the regulatory threshold for reporting.



## 5.0 BACT ANALYSES

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ARM 17.8.752 requires the owner or operator of a new or altered source to implement the maximum degree of air pollution reduction that is technically and economically available and feasible. This level of emissions reduction is referred to as “best available control technology” (BACT) and is a case-by-case decision that considers energy, environment, and economic impacts.

BACT can constitute either add-on control equipment or modifications to production processes depending on the emissions source. It may be a process design, work practice, operational standard, or addition of control equipment if imposition of an emissions standard is infeasible.

There is no universally accepted method for determining BACT, particularly for non-major sources of emissions. Thus, various methods can be applied in determining control technology to be used as BACT. Point sources and fugitive sources that have available add-on control technology options were examined with a top-down, five-step BACT approach. That approach is described below.

Guideline procedures outlined in the document “New Source Review Workshop Manual, Office of Air Quality Planning and Standards, US EPA, Draft - October 1990” were followed for sources with potential add-on control technology. The methodology consists of the following five basic steps:

- Step 1 - Identify all control options;
- Step 2 - Eliminate technically infeasible options;
- Step 3 - Rank remaining options by control effectiveness;
- Step 4 - Evaluate the most effective controls and document results; and
- Step 5 - Select BACT.

The New Source Review Workshop Manual is a draft guideline document although it provides a uniform and commonly used approach to BACT decision-making. Each step in the BACT analysis process is outlined below.

### **Step 1 - Identify All Control Options**

In a top-down BACT analysis, the first step is to identify all available control options for the emissions unit in question. Available control options are defined as air pollution control technologies or techniques that have a practical and potential application to emissions units and pollutants being evaluated.

### **Step 2 - Eliminate Technically Infeasible Options**

The second step of a top-down analysis accounts for source-specific factors by evaluating the technical feasibility of individual control options identified in Step 1. Determinations of technical infeasibility should clearly demonstrate how physical, chemical, and/or engineering principles would preclude the successful use of a control option on the

emissions unit under review. Technically infeasible control options are eliminated from further consideration.

### **Step 3 - Rank Remaining Options by Control Effectiveness**

Available control technology options deemed technically feasible from Step 2 are ranked in order of pollutant removal effectiveness. The control option that results in the highest pollutant removal value is considered the top control alternative.

### **Step 4 - Evaluate Most Effective Controls and Document Results**

The fourth step considers direct energy, environmental, and economic impacts associated with the most effective control option defined in Step 3. Both beneficial and adverse impacts are discussed and quantified when possible.

Energy impact analyses estimate direct energy impacts of the control alternatives in units of energy consumption. Environmental impact analyses consider effects of unregulated air pollutants or non-air impacts such as liquid, solid, or hazardous waste disposal and whether they would justify selection of an alternative control option. Economic impact analyses assess costs associated with installation and operation of the various control options.

If energy, environmental, or economic impacts disqualify the top BACT candidate then the next most effective alternative becomes the best control option and is then similarly evaluated. This process continues until the top technology under consideration cannot be eliminated due to any source-specific energy, environmental, or economic impact(s).

### **Step 5 - Select BACT**

The last step in evaluating BACT is to propose the most effective control option that remains after eliminating all non-viable options in Step 4. This step includes the proposal of a BACT-level emissions limit, or limits, if appropriate.

Generally, the following BSCP sources were evaluated under a “top-down,” emissions unit-specific approach.

- Mineral processing and handling (jaw crusher, surge bin, mill building processes);
- Auxiliary processing and handling (backfill plant, water treatment plant lime storage);
- Diesel engines/generators (both portable and stationary) including emergency generator, light plant, fire pump, and air compressor engines; and
- Propane and diesel heaters.

Because of the similarity in controls, the mineral and auxiliary processing are considered together. Other sources are evaluated through a review of operational standards, work practices, or the use of best operating practices (BOPs). Sources subjected to this type of BACT analysis would include:

- Small scale crushing and screening;
- Explosives detonation;
- Fugitive road dust;
- Material handling processes; and
- Wind erosion from material stockpiles/storage.

Insignificant units (diesel tanks and the gasoline tank) are not being analyzed due to their negligible emissions.

### **5.1 BACT for Particulate Matter Emissions from Mineral Handling and Processing (jaw crusher, surge bin, mill building processes) and Auxiliary Processing and Handling (backfill plant, water treatment plant lime storage)**

As described in Section 2, the mineral handling includes a jaw crusher, surge bin, and ore processing/milling. The auxiliary processing includes the backfill plant and the water treatment plant lime storage. These sources are individual emissions sources but are considered as a group with respect to control technology evaluation.

Of the list of regulated criteria pollutants, these sources emit particulates (PM, PM<sub>10</sub>, and PM<sub>2.5</sub>). The analyses presented here are restricted to evaluation of BACT for the product processing and handling. Note: Conveyors used in this processing are enclosed and are consequently excluded from further analysis.

#### **5.1.1 Step 1 - Identify All Control Options**

Table 5-1 lists and briefly describes available technologies for controlling particulate emissions from product processing and handling.

**Table 5-1: Available Particulate Control Technologies**

<b>Technology</b>	<b>Description</b>
No Add-on Control	This is the base case for proposed new sources.
Enclosure	Enclosure technology employs structures, devices or underground placement to shelter material from wind entrainment. Enclosures can either fully or partially surround the source.
Wet Dust Suppression Including Retained or Inherent Moisture	Fogging water spray adds water, with or without surfactant, to material. Emissions are reduced through agglomerate formation by combining small dust particles with larger aggregate or with liquid droplets. Moisture retained from water sprays upstream in the process or moisture inherent in the material provides a similar emission reducing effect.
Electrostatic Precipitator (ESP)	An ESP uses electrical forces to move entrained particles onto a collection surface. To remove dust cake from the collection surface, the collection surface is periodically “rapped” by a variety of means to dislodge the particulate, which drops down into a hopper. Particulate-laden air must be able to be collected and ducted to the ESP.
Wet Particulate Scrubber	Wet scrubbers typically use water to impact, intercept, or diffuse a particulate in a waste gas stream. Particulate matter is accelerated and impacted onto a solid surface or into a liquid droplet through devices such as a venturi and spray chamber. Wet slurry material is typically stored in an on-site waste impoundment.
Fabric Filter Dust Collector/Bin Vent/Baghouse	Fabric filter dust collectors/bin vents/baghouses direct particulate-laden exhaust through tightly woven or felted fabric that traps particulate by sieving and other mechanisms. Collection efficiency and pressure drop simultaneously increase as a particulate layer collects on the filter. Filters are intermittently cleaned by shaking the bag, pulsing air through the bag, or temporarily reversing the airflow direction.

### **5.1.2 Step 2 - Eliminate Technically Infeasible Options**

#### Wet Scrubber

Wet scrubbers can be very effective for particulate control; however, wet scrubbers would create a waste stream for disposal and are very seldom used on processes of this small size due to their complex operation, large footprint, and heavy use of water resources. For these reasons, a wet particulate scrubber as a control technology would be considered technically infeasible and not available to control particulate emissions from the mineral handling and processing.

#### Electrostatic Precipitators

Although ESP units are theoretically capable of controlling particulate emissions at levels similar to baghouses, they are generally not feasible for the application considered here. The EPA Air Pollution Cost Manual states that, “ESPs are not typically viewed as cost effective control devices for smaller sources” (U.S. EPA, 2002, pp. 4-15). Further, EPA

states in another technical report that, "Electrostatic precipitators are usually not suited for use on processes which are highly variable, since frequent changes in operating conditions are likely to degrade ESP performance" (U.S. EPA, 1998). Finally, Tintina is unaware of any application of an ESP to control fugitive particulate emitted during mineral processing/handling or auxiliary processing/handling. For these reasons, ESP technology is considered to be technically infeasible and not available to control particulate emissions from the product processing and handling.

### 5.1.3 Step 3 - Rank Remaining Options by Control Effectiveness

Table 5-4 ranks the remaining available alternatives according to their respective potential effectiveness values.

**Table 5-2: Control Technology Effectiveness Estimates**

<b>Technology</b>	<b>Control Efficiency</b>	<b>Ranking</b>
Fabric Filter Bin Vent/Dust Collector/Baghouse	95-99.9+%	1
Enclosure	Up to 90% (varies with degree of enclosure)	2
Wet Dust Suppression	50%	3
No Add-on Control	Base case	4

### 5.1.4 Step 4 - Evaluate Most Effective Controls and Document Results

Tintina proposes to install the top ranked control technology, fabric filter dust collector, to control particulate emissions from the mineral and auxiliary processing and handling points. Additional control will be provided by building enclosures for the jaw crusher, milling processes, backfill plant, and water treatment lime silo.

### 5.1.5 Step 5 - Select BACT

Based upon the preceding analysis, Tintina proposes that fabric filter dust collectors with a grain loading limit of 0.01 gr PM<sup>6</sup> (with respect to filterable emissions, the manufacturer uses the conservative approach of equating PM<sub>10</sub> and PM<sub>2.5</sub> emissions with PM) as BACT. The grain loading value is consistent with recent MDEQ-permitted small dust collectors installed in Montana. A review of the EPA RBLC results in the Metallic Mineral/Ore Processing Type (90.021) shows the fabric filter dust collector technology to be consistent with the few major source metallic mineral/ore processing determinations. See Appendix D for a summary of the RBLC results collected. As previously mentioned, RBLC results are exclusively PSD actions, not requirements resulting from minor source BACT. Appendix D also includes three relevant Montana minor source BACT determinations for reference. The sources with lower emission rates capitalize on larger economies-of-scale as compared to relatively small dust collectors analyzed. Larger processes provide for

<sup>6</sup> 0.01 gr/dscf as collected on the front half of a Method 5 train.

smaller air-to-cloth ratio; i.e., more filtration available for a unit amount of exhaust flow. The Texas Commission on Environmental Quality publishes current guidelines<sup>7</sup> for Bulk Material Handling which indicate that fabric filter baghouses with 0.01 gr/dscf grain loading specifications (approx. 99% reduction) constitute BACT for those types of sources.

## **5.2 BACT for Gaseous and Particulate Emissions from Diesel Engines/Generators**

Tintina is proposing to use a variety of diesel engines/generators from light plants powered by 14-hp diesel engines to 1,000-kilowatt emergency backup generators. All of these are subject to EPA non-road engine standards, as described in 40 CFR Part 89 and/or 1039, as well as NSPS Subpart IIII for RICE. BACT for these engines is compliance with EPA nonroad standards and NSPS Subpart IIII. The proposed BACT conforms to previous BACT determinations made by MDEQ for similar-sized diesel engines. With respect to using the most recent (and lowest emitting) engines available, 40 CFR 60.4208 requires owners and operators to install recently manufactured engines that meet the NSPS standards.

## **5.3 BACT for Gaseous and Particulate Emissions from Propane Heaters (23 MMBtu/hr and 52 MMBtu/hr each)**

Tintina is proposing to use two direct-fired propane heaters (one 23 MMBtu/hr and one 52 MMBtu/hr) at each intake vent to heat air entering the mine. Of the list of regulated criteria pollutants, these sources emit both gaseous and particulate emissions. The BACT analyses will be broken down in two categories for add-on control: CO/VOC and NOx. Particulate matter emissions from propane combustion are quite small and would be best controlled by good combustion practices. SO<sub>2</sub> emissions are negligible and result solely from the sulfur content of propane.

### **5.3.1 Step 1 - Identify All Control Options – CO/VOC**

CO and VOC are formed from the incomplete combustion of organic constituents in propane. Because CO and VOC are generated and controlled by the same mechanisms, they are addressed together. Two general and nonexclusive approaches were analyzed for controlling these emissions: improving combustion conditions to facilitate complete combustion in the heater burner and completing oxidation of the exhaust stream after it leaves the heater burner. Post-combustion CO/VOC control is accomplished via add-on equipment that creates an environment of high temperature and oxygen concentration to promote complete oxidation of the CO and VOC remaining in the exhaust. This can be facilitated at relatively low temperatures by the use of certain catalyst materials.

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<sup>7</sup> Updated January 2013:

[https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/bact/bact\\_bulkmh.pdf](https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/bact/bact_bulkmh.pdf)

**Table 5-3: Available CO/VOC Control Technologies**

<b>Technology</b>	<b>Description</b>
Proper system design and operation	The base level of emissions for CO and VOC is proper design and operation of the proposed heater without additional add-on control. The CO and VOC emissions can be minimized by controlling the system temperatures through operation at maximum loads; increasing oxygen concentrations; maximizing combustion residence time; and improving mixing of the fuel, exhaust gases, and combustion air. Generally, a reduction in CO and VOC emissions will result in an increase in NOx emissions.
Thermal oxidation	Thermal oxidizers are essentially supplementary chambers that complete the fuel combustion of unburned organic constituents. They accomplish this by creating a high temperature environment with optimal oxygen concentration, mixing, and residence time. They require temperatures of approximately 1400 degrees Fahrenheit (°F) to 1500°F. This high temperature environment is produced by the combustion of supplemental fuel, generally natural gas. Several design variations address different inlet concentrations, air flow rates, fuel efficiency requirements, and other operational variables. All of them function using the basic principles described above. One commonly used design is called a regenerative thermal oxidizer (RTO) which is evaluated for this BACT analysis. RTOs are capable of reducing CO and VOC emissions by 95 to 99 percent.
Catalytic oxidation	Catalytic oxidizers employ the same principles as thermal oxidizers, but they use catalysts to lower the temperature required to affect complete oxidation. One commonly used design is called a regenerative catalytic oxidizer (RCO) which is evaluated for this BACT analysis. The optimum temperature range for catalytic oxidizers is generally about 800°F. Catalytic oxidizers must be located downstream of a PM control device if the exhaust stream contains appreciable concentrations of PM because catalysts are prone to plugging and poisoning. For this application, the portal heater would be combusting a clean fuel (propane) and PM loading is not anticipated to be a problem. Like thermal oxidizers, catalytic oxidizer designs include many varieties to address specific operational conditions and requirements. They are generally capable of 90 to 99 percent destruction or removal efficiency at steady-state conditions.

**5.3.2 Step 2 - Eliminate Technically Infeasible Options – CO/VOC**

The proposed portal heaters are direct-fired burners where the combustion exhaust gases and the heated air are inseparable. This configuration makes the practical installation of the add-on pollution control equipment addressed here technically infeasible. The remaining option is proper system design and operation.

**5.3.3 Step 3 - Rank Remaining Options by Control Effectiveness – CO/VOC**

Proper design and operation was determined to be the only technically feasible control option for the portal heaters.

### **5.3.4 Step 4 - Evaluate Most Effective Controls and Document Results – CO/VOC**

Proper design and operation was determined to be the only technically feasible control option for the portal heater.

### **5.3.5 Step 5 - Select BACT – CO/VOC**

Tintina proposes that proper design and operation of the two propane-fired vent heaters are BACT for CO and VOC. The combustion of a clean fuel (propane) and following good combustion practices is proposed as BACT for the heaters associated with this project. The proposed BACT conforms to previous BACT determinations made by MDEQ.

### **5.3.6 Step 1 - Identify All Control Options – NO<sub>x</sub>**

NO<sub>x</sub> is formed during propane combustion in the heater. NO<sub>x</sub> comes from two sources in combustion, fuel NO<sub>x</sub> and thermal NO<sub>x</sub>. The fuel NO<sub>x</sub> portion is relatively small and is based almost solely on the type of fuel combusted. The majority of NO<sub>x</sub> formation is dominated by the process called thermal NO<sub>x</sub> formation. Thermal NO<sub>x</sub> results from the thermal fixation of atmospheric nitrogen and oxygen in the combustion air. The rate of formation is sensitive to local flame temperature and, to a lesser extent, local oxygen concentrations. Virtually all thermal NO<sub>x</sub> is formed in the region of the flame at the highest temperature. Maximum thermal NO<sub>x</sub> production occurs at a slightly lean fuel-to-air ratio due to the excess availability of oxygen for reaction with the nitrogen in the air and fuel. The following table contains NO<sub>x</sub> control technologies for heaters.



**Table 5-4: Available NOx Control Technologies**

<b>Technology</b>	<b>Description</b>
Proper system design and operation	The base level of emissions for NOx is proper design and operation of the proposed heater without additional add-on control.
Low NOx Burners with Flue Gas Recirculation	Due to limited success of Low NOx Burners (LNB) in lowering NOx emissions as a stand-alone technology, it has been integrated with Flue Gas Recirculation (FGR). Together, LNB and FGR integrate staged combustion into the burner creating a fuel-rich primary combustion zone. Fuel NOx formation is decreased by the reducing conditions in the primary combustion zone. Thermal NOx is limited due to the lower flame temperature caused by the lower oxygen concentration. The secondary combustion zone is a fuel-lean zone where combustion is completed. The combined technology may result in increased CO and hydrocarbon emissions, decreased boiler efficiency and increased fuel costs.
Selective Non-Catalytic Reduction	Selective Non-Catalytic Reduction involves the noncatalytic decomposition of NO <sub>x</sub> in the flue gas to nitrogen and water using a reducing agent (e.g., ammonia or urea). The reactions take place at much higher temperatures than in an SCR, typically between 1,650°F and 2100°F, because a catalyst is not used to drive the reaction. The efficiency of the conversion process diminishes quickly when operated outside the optimum temperature band and additional ammonia slip or excess NO <sub>x</sub> emissions may result.
Selective Catalytic Reduction	Selective Catalytic Reduction (SCR) is a post-combustion gas treatment technique for reduction of NO and NO <sub>2</sub> in an exhaust stream to molecular nitrogen, water, and oxygen. Ammonia (NH <sub>3</sub> ) or urea is used as the reducing agent. Ammonia or urea is injected into the flue gas upstream of a catalyst bed, and NO <sub>x</sub> and NH <sub>3</sub> combine at the catalyst surface, forming an ammonium salt intermediate, which subsequently decomposes to produce elemental nitrogen and water. The control technology works best for flue gas temperatures between 575°F and 750°F. Excess air is injected at the heater exhaust to reduce temperatures to the optimum range, or the SCR is located in a section of the heater exhaust ducting where the exhaust temperature has cooled to this temperature range.

**5.3.7 Step 2 - Eliminate Technically Infeasible Options – NOx**

The proposed portal heaters are direct-fired burners where the combustion exhaust gases and the heated air are inseparable. This configuration makes the practical installation of the FGR as well as add-on pollution control equipment addressed here technically infeasible. The remaining option is proper system design and operation.

**5.3.8 Step 3 - Rank Remaining Options by Control Effectiveness – NOx**

Proper design and operation was determined to be the only technically feasible control option for the portal heaters.

### **5.3.9 Step 4 - Evaluate Most Effective Controls and Document Results – NOx**

Proper design and operation was determined to be the only technically feasible control option for the portal heater.

### **5.3.10 Step 5 - Select BACT - NOx**

Tintina proposes that proper design and operation of the two propane-fired vent heaters are BACT for NOx. The combustion of a clean fuel (propane) and following good combustion practices is proposed as BACT for the heaters associated with this project. The proposed BACT conforms to previous BACT determinations made by MDEQ.

### **5.4 BACT for Gaseous and Particulate Emissions from Small, Temporary, Portable Propane (nine heaters, 37.8 MMBtu/hr total) and Diesel Heaters (three heaters, 1.2 MMBtu/hr total)**

Tintina proposes to use temporary heaters during the development phase for worker safety and to heat mine intake air, as necessary. The BACT analysis regarding the temporary diesel heaters in use at the portal and the temporary portable propane heaters that will be moved site-wide has been combined to assess BACT for small clean-burning heaters. Based on the small size of the heaters and the minimal emissions generated, particularly as temporary units, no add-on control technology would be economically feasible. Emissions of all criteria pollutants will be minimized through the combustion of propane and diesel and by following good combustion practices for these units.

The combustion of clean fuels (propane and diesel, respectively) and following good combustion practices is proposed as BACT for the small, portable, temporary heaters associated with this project. The proposed BACT conforms to previous BACT determinations made by MDEQ for similar-sized propane and diesel heaters.

### **5.5 BACT for Particulate Emissions from Small Crushers and Screens (250 TPH crusher and two 400-TPH screens)**

PM emissions are created by crushing and screening equipment. The potential uncontrolled emissions of particulate matter emissions from these operations can be significant. The moisture content of the material processed can have a substantial effect on emissions. Surface wetness causes fine particles to agglomerate on or to adhere to the faces of larger stones, with a resulting dust suppression effect. However, as new fine particles are created by crushing and attrition and as the moisture content is reduced by evaporation, this suppressive effect diminishes. Operators that use wet suppression systems (spray nozzles) to maintain material moisture as needed can effectively control PM emissions throughout the process. Therefore, Tintina proposes wet suppression as BACT for the control of PM emissions on the small, portable crushing and screening units.

## 5.6 BACT for Gaseous and Particulate Emissions from Explosives Detonation/Blasting (ANFO)

Explosives (primarily ANFO) will be used for underground mining and will result in the release of gaseous (NO<sub>2</sub>, SO<sub>2</sub>, and CO) and particulate (PM, PM<sub>10</sub>, and PM<sub>2.5</sub>) emissions. ANFO is a common bulk industrial explosive mixture that accounts for roughly 80% of explosives used annually in North America. The mixture provides a reliable explosive that is relatively easy to use, highly stable until detonation, and low cost. Gaseous emissions will result from the detonation of the chemical compounds with the explosives. Particulate emissions will result from the blasting and loosening of ore material. While blasting seemingly generates large amounts of dust, the operation occurs infrequently enough that it is not considered to be a significant contributor of PM<sub>10</sub> [EPA 1991; Richards and Brozell 2001].<sup>8</sup> Nonetheless, various best operational practices (BOPs) and blasting techniques will be utilized for reducing gaseous and particulate emissions from blasting.

Tintina will use the following blasting BOPs:

- Optimize drill-hole size. Optimizing drill-hole size will result in effective blasting and reduce the number of blasts needed to achieve the desired effect.
- Optimize drill hole placement and utilization of sequential detonation. Optimizing drill hole placement will ensure that all material is successfully detonated, and additional explosives are not needed in order to achieve complete fragmentation.
- Optimize usage of explosive. Proper usage of explosive prevents the detonation of unnecessary, excess explosive and resulting excess emissions.
- Mine planning will result in blasting that is conducted in a manner that prevents overshooting and minimizes the area to be blasted.

Section 3 estimates potential pollutant emission rates that will result from blasting and describes the basis for those estimations. The estimated values are sufficient for use in ambient impacts demonstrations and in regulatory applicability analyses. It would not be appropriate to assign these values as a permit limit due to uncontrollable variables inherent in the blasting process and the technical infeasibility of measuring the emission rates for compliance demonstration. Because the imposition of an emission standard is infeasible in this instance, Tintina proposes that BACT for reducing blasting emissions is a work practice condition to use proper blasting techniques, proper explosive selection, optimized application of explosives, and the utilization of best operating practices. These work practice conditions collectively reduce the amount of gaseous and particulate emissions resulting from explosives detonation.

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<sup>8</sup> DHHS CDC NIOSH Dust Control Handbook for Industrial Minerals Mining and Processing (page 101).

## 5.7 BACT for Fugitive Particulate Emissions from Roads

Particulate emissions from fugitive road dust will result from vehicle and equipment travel on roadways within the BBCP mine site. BBCP roadway categories include permanent haul roads, temporary haul roads (used primarily during development phase), and mine access roads. Emissions were calculated for those roads based on vehicle type, activity, and frequency of trips. However, the overall control strategy for the roads will be discussed as a whole. Table 5-5 lists particulate control technologies available for reducing roadway fugitive emissions.

**Table 5-5: Available PM Control Technologies for Roadway Fugitive Emissions**

<b>Technology</b>	<b>Description</b>
No Add-on Control	This is the base case for proposed roadways.
Vehicle Restrictions	Restrict vehicle speed to reduce fugitive dust and increase distance between vehicles.
Surface Improvement	Improve roadway surfaces by paving with asphaltic concrete or other additives.
Surface Treatment	Wet suppression or surface treatment with chemical dust suppressants.

Initially, surface improvement using asphaltic concrete appears to be the most desirable road surface material and potential control technology. It offers a high coefficient of road adhesion and creates a surface that reduces dust problems. However, using this road composition has a seasonal disadvantage in climates with snow or freezing rain. The smooth surface of asphalt offers little resistance to the development of ice or snow causing the roadway to become extremely slick and remain so until a facility employs corrective measures. This could constitute a serious threat to operational safety in mining areas where rapid and frequent freeze conditions prevail.<sup>9</sup> South-central Montana experiences many freeze/thaw periods throughout the year creating a potential safety hazard from the use of paved mine haul roadways.

The Design of Surface Haulage Roads Manual further states that “the high cost of asphaltic road surface severely restricts its feasibility on roads of short life. In most cases, a 4-inch layer of road surface may be accepted as the minimum requirement road depth due to the extreme weight of vehicles constantly traveling haul road surfaces. The cost of constructing a 4-inch thick layer ranges from \$46 to \$57 per square yard for labor, equipment, and material. Using the higher figure for a 5-mile road 30 feet wide would

<sup>9</sup> United States Department of Interior NIOSH: Design of Surface Haulage Roads – A Manual (Kaufman and Ault) (page 23).

necessitate an expenditure of \$440,000 for paving alone.” Additionally, a sufficient sub-base and base course must be established prior to placing the asphalt. The necessary base course is an additional expense to be considered in total construction cost.

The Design of Surface Haulage Roads Manual continues to state that a great number of surface mining operations throughout the country are currently using gravel and crushed stone surface haulage roads. They provide a stable roadway that resists deformation and provides a relatively high coefficient of road adhesion with low rolling resistance. The Manual states that it would be impractical to use a permanent surface improvement control such as asphaltic concrete in areas where haul roads are subject to relocation or must accommodate heavy tracked vehicles.

A significant amount of traffic on BBCP roads will consist of haul trucks and other heavy machinery. Consequently, BBCP determined that surface improvement control techniques utilizing asphaltic concrete are both economically impractical and potentially hazardous.

The BBCP roads vary in both silt and moisture content and produce a varying degree of fugitive road dust emissions. A combination of surface treatments and vehicle restrictions are proposed to reduce fugitive road dust emissions

Tintina proposes the utilization of water as a surface treatment for all mine roads and along mine roads, with chemical dust suppressants considered as necessary (particularly on high traffic areas near private ranch buildings). Water sprays will be utilized to increase the moisture content of mine access roadway material in order to conglomerate particles and reduce the likelihood of fugitive particulate. The water sprays will be applied as necessary. Further vehicle restrictions will be also be enforced as necessary in order to control fugitive emissions from mine access road travel. This includes the limitation of vehicle speed. These measures, as well as available reasonable precautions, will maintain compliance with ARM.17.8.304 and ARM 17.8.308.

## **5.8 BACT for Fugitive Particulate Emissions from Material Handling, Removal, and Stockpiles/Storage**

Contemporaneous reclamation of disturbances will be a priority during the construction period. Maintaining reclaimed areas will be an ongoing BBCP focus. Surface disturbances related to cut and fill slopes associated with roads, ditches, embankment faces, and the disturbed perimeter of facility footprints will be reclaimed immediately where possible after final grades have been established. Reclamation includes: grading, slope stabilization, drainage control, topsoil and subsoil placement, and seeding. It is expected that these reclaimed areas will be fully revegetated within two to four years following construction. Temporary waste rock and life-of-mine copper-enriched rock storage areas will also be watered as necessary to minimize dust while loading or unloading material. Monitoring by site personnel during each shift will ensure watering is done to the level required to minimize the effects of dust at the site.

Construction-related disturbances that may generate dust and are not needed operationally will be recontoured, soil placed, and revegetated as quickly as possible following construction. This will include road cut-and-fill slopes, facility berms (WRS stockpile and mill facility), embankments and berms of the CTF, CWP, PWP, WRS and NCWR, buried pipelines, water diversion ditches, and soil/subsoil stockpiles. Dust control from the CTF is not expected to be problematic because the material will be moist (20%) and will be stabilized with cement additions to provide a non-flowable mass.

Other components of the dust control plan include (other specific emitting units are covered previously):

- Minimizing exposed soil areas to the extent possible by prompt revegetation of reclaimed areas,
- Establishing temporary vegetation on inactive soil and sub-soil stockpiles that will be in place for one year or more,
- Minimizing drop heights, etc. to minimize dust production from material transfer;
- Use of water and chemical dust suppression products to stabilize access and trucking road surfaces (with additional water application during dry periods), and
- Covering/enclosure of conveyor belts.

These measures, as well as available reasonable precautions, will maintain compliance with ARM.17.8.304 and ARM 17.8.308.

## **6.0 AMBIENT AIR QUALITY ANALYSIS**

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Montana's air quality rules require an applicant for a stationary source air quality permit to demonstrate compliance with ambient air quality standards designed to limit environmental impacts from air pollution emissions. This demonstration may be accomplished using professional judgment based on factors such as potential emission levels, emission source characteristics, existing air quality, regional meteorological conditions, surrounding terrain, and the proximity and scale of other nearby stationary emissions sources. MDEQ and EPA facilitate this type of analysis by providing guideline *de minimis* emission rates that in some cases may be used to indicate acceptable ambient impacts. In cases where *de minimis* emission levels are deemed inapplicable or where they would be exceeded, compliance with ambient standards is demonstrated using approved air dispersion modeling techniques.

The following air dispersion model analysis has been performed to demonstrate that the development and operation of the proposed BBCP will not cause or contribute to a violation of the NAAQS. The air dispersion analysis methodology has been designed in accordance with the State of Montana Modeling Guidance for Air Quality Permit Applications (November 2007 Draft) (*Modeling Guideline*) and Appendix W, 40 CFR Part 51, Revisions to the Guideline on Air Quality Models (Revised), January 17, 2017 (*Guideline Document*).

This section provides an explanation of the proposed facility and operating plan as it pertains to the ambient air quality modeling analyses and air dispersion modeling procedures. It discusses the modeling methodology used to assess ambient impacts such as model source parameters, emission rates, meteorological data processing and representative data selection, and selections of AERMOD technical options.

### **6.1 Ambient Concentration Modeling Methods**

#### **6.1.1 Modeling Applicability**

Montana's air quality rules require an applicant for a stationary source MAQP to demonstrate compliance with ambient air quality standards designed to limit environmental impacts from air pollution emissions. Potential-to-Emit (PTE) emissions from the proposed BBCP were modeled for the pollutants and averaging periods listed in Table 6-1 in comparison to the Significant Impact Levels (SILs) and NAAQS modeling thresholds.

**Table 6-1: SIL and NAAQS Pollutants and Averaging Periods**

<b>Pollutant</b>	<b>SIL/NAAQS Averaging Periods</b>
PM <sub>10</sub>	24-Hour
PM <sub>2.5</sub>	24-Hour, Annual
NO <sub>2</sub>	1-Hour, Annual
SO <sub>2</sub>	1-Hour, 3-Hour, 24-Hour, Annual
CO	1-Hour, 8-Hour

### **6.1.2 Modeling Methodology**

The modeling analysis was conducted in accordance with the methodology outlined in EPA's Draft New Source Review Workshop Manual, October 1990. This document, along with the *Modeling Guideline* and subsequent EPA guidance, outlines a four-phased approach for a modeling analysis.

**Phase 1: Significant Impact Area Analysis** - The first step is to define the area of influence of the proposed project. The impacted areas within the receptor grid are specific to each pollutant and averaging time due to source characteristics, emission rates, and influence from terrain and meteorological data. Pollutant and averaging period-specific impact areas are determined by modeling source emission rate impacts for individual pollutants on a receptor network and then assessing the impacts for each respective averaging period. An impacted area is therefore assessed for each pollutant/averaging period combination.

The receptor network utilized in this modeling analysis consists of a Cartesian grid that follows the grid spacing outlined in Section 6.3.1. The grid is designed to capture all potential impacts exceeding SILs and extends outward as far as necessary to adequately encompass all receptors with modeled concentrations equal to or exceeding the SILs listed in Table 6-2. The Phase 1 analysis ensures that all impacts exceeding the SILs are accounted for within the modeling area.



**Table 6-2: Significance Levels for Air Quality Impacts**

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Modeling Significance Level (<math>\mu\text{g}/\text{m}^3</math>)</b>
CO	1-Hour	2,000
	8-Hour	500
NO <sub>2</sub>	1-Hour	7.52
	Annual	1
SO <sub>2</sub>	1-Hour	7.8
	3-Hour	25
	24-Hour	5
	Annual	1
PM <sub>2.5</sub>	24-Hour	1.2
	Annual	0.3
PM <sub>10</sub>	24-Hour	5

Modeling analysis for compliance with the NAAQS can proceed once the farthest significant receptor is established for each pollutant/averaging period combination and the extent of the designed receptor grid is verified to capture all exceedances of the SILs. The SILs are more stringent thresholds than the NAAQS so compliance with the SILs ensures compliance with the NAAQS. Consequently, NAAQS analyses generally proceed only for the receptors exceeding the SILs.

The SIL and NAAQS modeling analyses were modeled concurrently for this demonstration in the interest of shortening model runtimes due to the large number of volume sources. The NAAQS modeling methodology is captured in Phase 2.

**Phase 2: PSD and Ambient Analyses** - The next phase of the analysis is the modeling of all appropriate emission sources within the project's impact area described in Phase 1. Sources outside of the impact area are included if they are deemed to influence the project's area of impact. EPA guidance suggests that all minor and major stationary sources within the significant impact area should be considered. No surrounding sources were found within the area of influence for the BBCP. This is further described in Section 6.2.4.

A Class II PSD increment modeling analysis is not required since Tintina is not subject to PSD regulations or permitting requirements. However, a modeling analysis for comparison to the NAAQS was performed for each criteria pollutant and averaging period. The NAAQS analysis includes facility-wide emissions from Tintina as well as ambient background concentrations for comparison to the NAAQS. Selection of ambient background data is described in Section 6.3.6.

**Phase 3: Hot Spot Analysis** - Following Phase 2, the modeling grid is modified to include any unidentified "hot spot" receptors. This step involves identifying the peak receptor for each pollutant and averaging period assessed for NAAQS compliance. As necessary, additional receptors are centered on the peak receptor in a Cartesian grid with more refined receptor spacing than the original grid. Thus, a smaller grid is used to evaluate potentially higher impacts at a closer spaced receptor. The model is rerun with these added receptors to identify the receptor location that yields the highest predicted concentration value. If necessary, the hot spot receptor grid is expanded until the receptor with the highest predicted concentration is located inside the grid, not on its edge.

No hot spot analyses were required for this modeling demonstration as described in Section 6.4.2.

If the final time-average modeled concentrations are below the standards, no other analyses are required. If a modeled exceedance of a standard is noted, then the modeling proceeds to Phase 4.

The BBCP modeled concentrations are below the standards and no other analysis is required.

**Phase 4: Cause and Contribute** - If results of the Phase 2 and Phase 3 analyses would have indicated a modeled exceedance of a PSD or NAAQS standard, additional analyses would be performed to determine the facility's contribution to exceeded impacts. A Phase 4 analysis would identify the contributed impacts resulting from the proposed project's emissions at an exceedance in comparison to the contributed impact of surrounding source emissions. If the project's contribution to any modeled exceedance is less than a defined significance threshold, no further analysis would be required. If such is not the case, the modeling inputs (emission reductions, for example) would be modified to reduce concentration impacts and the impacts demonstration would be repeated.

A Phase 4 analysis was not required because no PSD or NAAQS standard was exceeded for the BBCP.

### 6.1.3 Model Selection

#### Model Selection Overview

Dispersion modeling uses mathematical formulations to characterize the atmospheric processes that disperse a pollutant emitted by a source. Based on emissions and meteorological inputs, a dispersion model can be used to predict concentrations at selected downwind receptor locations. These air quality models are used to determine compliance with the SILs, NAAQS, and other regulatory requirements such as New Source Review (NSR) and Prevention of Significant Deterioration (PSD) regulations (NSR and PSD are not applicable in this case).

Dispersion models are addressed in Appendix A of EPA's *Guideline Document* (also published as Appendix W of 40 CFR Part 51), which was originally published in April 1978

to provide consistency and equity in the use of modeling within the U.S. air quality management system. The *Guideline Document* is periodically revised to ensure that new model developments or expanded regulatory requirements are incorporated. Appendix W was last updated with a final rule published in the *Federal Register* on January 17, 2017.

The EPA preferred and recommended models for air quality dispersion modeling are as follows:

**AERMOD Modeling System** - AERMOD is a steady-state Gaussian plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. AERMOD has replaced Industrial Source Complex (ISC3) as the preferred Gaussian plume model for near-field dispersion (within 50 km).

**CALPUFF Modeling System** – CALPUFF is a non-steady-state puff dispersion model that simulates the effects of time- and space-varying meteorological conditions on pollution transport, transformation and removal. CALPUFF can be applied for long-range transport (LRT) and for complex terrain.

**Other Models** – Other recommended models are suited for specific circumstances as described below:

- BLP is designed to handle unique modeling problems associated with buoyant line sources.
- CTDMPLUS/CTSCREEN is used for predicting impacts in complex terrain under all stability conditions.
- CALINE3 is used for predicting air pollution levels near highways and arterial streets. CALINE3 is incorporated into the more refined CAL3QHC and CAL3QHCR models.
- OCD is used to assess impacts near shorelines from offshore sources.

### *Selected Model*

The model selected for the BBCP air dispersion modeling analysis is AERMOD as recommended by the *Modeling Guideline*. AERMOD is also the EPA-recommended model for refined modeling applications in simple and complex terrain situations within a 50-km modeling domain.

AERMOD has features capable of handling multiple point, area, line, and volume sources, hourly meteorological data, building downwash effects, and simple and complex terrain. The following discussion further explains the features of AERMOD and its corresponding preprocessors, AERMET and AERMAP.

AERMOD is a steady-state plume dispersion model for the assessment of pollutant concentrations from a variety of sources. AERMOD simulates transport and dispersion from multiple sources based on an updated characterization of the atmospheric boundary layer. Sources may be located in rural or urban areas and receptors may be located in simple or complex terrain. AERMOD accounts for building wake effects and plume

downwash. Sequential meteorological data is processed to estimate concentrations for averaging times from one hour to one year. AERMOD is appropriate for point, volume, and/or area sources; for surface, near-surface, and elevated releases; for rural or urban areas; for simple and complex terrain; for transport distances over which steady-state assumptions are appropriate (up to 50 km); and for continuous toxic air emissions. AERMOD's regulatory default option includes the use of terrain elevation data, stack-tip downwash, and sequential date checking.

AERMOD is designed to accept input data prepared by two specific pre-processor programs, AERMET and AERMAP. AERMET processes meteorological data available from several sources including on-site meteorological stations and the National Climatic Data Center (NCDC). AERMAP processes digital elevation data available from several different sources.

AERMET is designed to accept National Weather Service (NWS) 1-hour surface observations, NWS twice-daily upper air soundings, and data from on-site meteorological measurement systems. These data are processed in three steps. The first step extracts data from the archive data files and performs various quality assessment checks. The second step merges all available data (both NWS and on-site). These merged data are stored together in a single file. The third step reads the merged meteorological data and estimates the boundary layer parameters needed by AERMOD. AERMET writes two files for input to AERMOD: a file of hourly boundary layer parameter estimates and a file of multiple-level (when the data are available) observations of wind speed and direction, temperature, and standard deviation of the fluctuating components of the wind direction.

AERMAP processes terrain elevation data available from the U.S. Geological Survey (USGS). The data are available in three distinct formats including Digital Elevation Model (DEM), Spatial Data Transfer Standard (SDTS), and National Elevation Dataset (NED). AERMAP first determines the base elevation at each receptor and source. For complex terrain situations, AERMOD captures the essential physics of dispersion in complex terrain and needs elevation data that convey the features of the surrounding terrain. In response to this need, AERMAP searches for the terrain height and location that has the greatest influence on dispersion for each individual receptor. This height is then referred to as the hill height scale. Both the base elevation and hill height scale data are produced by AERMAP as a file or files which can be directly accessed by AERMOD.

The most current EPA-accepted AERMOD and preprocessor versions will be used for the air quality impact analysis. For this application, the source code for the AERMOD modeling system is provided by BEE-Line Software Version. Versions of the modeling programs to be used are listed in Table 6-3.

**Table 6-3: Air Dispersion Modeling Programs**

<b>Model/Program Name</b>	<b>Version</b>
AERMOD	Version 16216r

<b>Model/Program Name</b>	<b>Version</b>
AERMET	Version 16216
AERMAP	Version 11103
BPIPPRM	Version 04274
BEEST	Version 11.10

The complete model input and output files, including meteorological and terrain data files, are included on the DVD provided with the application. A summary of the model results is discussed in Section 6.4.

## **6.2 Model Setup and Inputs**

Mine property will consist of three main parcels due to the boundary being intersected by Sheep Creek Road and Butte Creek Road. The northwest sector consists of the mine ventilation raises while the northeast portion provides access to a water well utilized by Tintina. The southern property sector contains all mining operations including the mine portal, milling and material processing facilities, two backup reciprocating internal combustion engine (RICE) gensets, a cement tailings facility, material stockpiles, and various water containments. (See Appendix B, Figure 1.)

Mining will occur at a rate of approximately 1.3 million tons/year or roughly 3,640 tons of Copper Enriched Rock per day. The expected life of the mine is approximately 19 years including a two-year development phase consisting of construction and pre-production mining and four years of reclamation and closure. This results in approximately 13 years of active production mining.

All mined rock will be brought to the surface through a single mine portal along a decline (tunnel) providing additional lower ramp access to the upper and lower Johnny Lee zones. The material will be processed through a series of sizing and flotation processes in order to liberate and concentrate copper for future smelting. See Section 2 for more detailed mine processes and activities.

The model conservatively overestimates facility-wide operations by simultaneously modeling the processes occurring in both the mine development and production phases. The development of the mine will be a dynamic process where mine sections will be developed subsequent to each other. Certain earthwork activities could occur throughout multiple areas of the mine. The model again overestimates operations by accounting for all construction processes within the development phase to occur simultaneously.

Due to the overestimated approach in the model setup, the models account for mine activities simultaneously occurring for the development phase including earthwork, excavation, pad prep, embankment construction, material transferring and hauling, and electrical generation by two generators as well as production phase sources accounting for milling and material processing sources controlled by baghouses, material transfers,

and hauling. Road dust fugitive emissions have also been included for haul road and access road traffic in both development and production phases.

## **6.2.1 Facility Layout**

### **Site Description**

The Tintina mine permit boundary will encompass all operations within 1,888 acres of privately owned ranch land under lease to Tintina. The project area consists of all private land owned by the Bar Z Ranch and Short Ranch. The land is currently used predominately for agriculture, livestock grazing, and hay production. Outfitters also utilize the Sheep Creek drainage for hunting and fishing. All access to the mine area is closed to public access.

The proposed mine permit area resides in Sections 24, 25, and 36 in Township 12N, Range 6E, and Sections 19, 29, 30, 31, and 32 in Township 12N, Range 7E. The main area of the mine is located at UTM coordinates 506,725 meters East, 5,179,710 meters North (NAD 83, Zone 12).

The area is characterized by forested mountains and rolling hills, grasslands and shrub lands, and creeks supplying the upper Sheep Creek drainage. Conifer Forest and Woodland habitat types are located within the surrounding area and include species of Douglas-fir, common juniper (less frequent), and Engelmann spruce (infrequent). Grassland and shrub land varies considerably among vegetation types in the area. Cropland is comprised of hay crops grown throughout the area and within the Sheep Creek floodplain.

The climatology of the immediate project area is boreal and is classified as a snowy climate with fully humid, warm summers. Adjacent rangeland is classified as a cold arid steppe.<sup>10</sup> Rainfall is approximately 13 inches per year.

The air quality classification for the area is “Better than National Standards” or unclassifiable/attainment for the National Ambient Air Quality Standards for criteria pollutants (40 CFR 81.315). There are no non-attainment areas near the site. The Gates of the Mountains Wilderness Area is approximately 38 miles northwest of the proposed mine boundary.

U.S. Highway 89 is located approximately 2.15 miles west of the mine portal and milling area. Meagher County roads, Butte Creek Road and Sheep Creek Road, run adjacent to the mine permit boundaries and traverse through the property creating the three property areas (Figure 1).

### **Ambient Air Boundary**

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<sup>10</sup> Per Koppen-Geiger climate map, available from <http://koeppen-geiger.vu-wien.ac.at/>

As previously noted, all of the land within the Permit Boundary Area is privately owned ranch land under lease agreement to Tintina. Butte Creek Road and Sheep Creek Road will continue to provide public access to the surrounding area throughout mine development and production and are the only areas in which public access can occur through the Mine Permit Boundary area. These two roads are excluded from the Mine Permit Boundary Area as shown on Figure 1 and public access is precluded through the use of barbed wire fence on both sides of the road and locked gates for private ranch access. These fences extend eastward from the Mine Permit Boundary area to US Highway 89 which is also fenced. Therefore, there is no public access to either the privately-owned ranch land or to the Mine Permit Boundary area. Furthermore, there is additional internal fencing within the three Mine Permit Boundary area parcels including new fencing around the mine area (Appendix B, Figure 1, labeled “New Fence”) and new fencing surrounding the water-bearing lined containments and the mine intake and exhaust vents.

The modeled fenceline is created from the Mine Permit Boundary area illustrated in Appendix B, Figure 1. The figure was geo-rectified and input into BEEST to design the facility boundary.

### **General Layout, Buildings, and Structures**

The general facility layout was designed in the model using geo-rectified versions of Appendix B, Figures 1 and 2. Figure 1 details the overall layout of the entire mine facility and was used to place the mill pad, portal pad, stockpiles, cemented tailings facility (CTF), roadway, mine vents, and water containments. Figure 2 provides a detailed view of the mill pad area and was used to place buildings, tanks, containments, silos, and other structures within the model. Building heights are input as their design heights to be constructed from construction pad level. The mill pad and portal pad will be constructed to an elevation of 1785 meters as discussed in Section 6.3.2. All buildings and structures were set to the construction grade elevation.

Two access roads provide entry to the mine facilities and are indicated in Appendix B, Figure 1. The Main Access Road extends from Sheep Creek Road to the east end of the mill pad. Most access will occur on this road for worker vehicles, material deliveries, waste removal, and concentrate trucks. A Construction Access Road will also be utilized during the early stages of the development phase while the Main Access Road is being constructed. The Construction Access Road already exists on site and will provide access for worker vehicles, material deliveries, and waste removal. Once the construction of the Main Access Road is complete, the Construction Access Road will be used less frequently.

Haul roads exist throughout the mine area and are illustrated in Appendix B, Figure 1. The main corridors within the Mine Operating Boundary area include the CTF Road which runs from the west end of the mill pad to the CTF and the North Mill Road which provides transport north of the mill pad to the west end of the portal pad. Additional haul roads designated as “service roads” provide haul truck access to the stockpiles and water

reservoirs throughout the mine area. The service roads are smaller than the main haul roads and will experience less frequent haul truck traffic.

Additional figures depicting layouts of structures (water containments, CTF, etc.) throughout the facility are included in the Mine Operating Permit Application.<sup>11</sup>

### Source Locations

Emission sources were placed in the model using Appendix B, Figures 1 and 2 and information provided in the Mine Operating Permit Application.

The 545-kW and 320-kW diesel engines will be located on the portal pad during mine development. They will provide electrical power during the development phase until line power is connected to the site. They will be removed once the production phase begins. The air compressor engine will also be located at facilities on the portal pad during the development phase and will be removed after development has been completed.

The mine portal location is depicted in Appendix B, Figure 1. The temporary diesel heaters to be placed at the portal were inserted near the opening within the model as described in the modeled source description. Figure 1 also illustrates the locations of road volume source placements and fugitive emissions from mine development and production. The road sources are placed along the roadways described in Section 6.2.2 in volume source configurations described in Section 6.2.3. The non-road fugitive emissions are placed in the area where they will occur as illustrated in Figure 1. For example, sources associated with excavation, wind erosion, pile disturbance, and material transfers to and from haul trucks at the Waste Rock Storage Pile are placed in the Waste Rock Storage Pile area as shown in Figure 1.

The jaw crusher enclosure is shown in Appendix B, Figure 1. The portable conical crusher and screening unit will be operated in years 0 through 3 only. It will principally be used in the Temporary Construction Stockpile area in years 0 to 2.0 and on the floor of the Cemented Tailings Facility in year 2 to 2.5. It has been placed near the Temporary Construction Stockpile in the model.

Mill pad sources are illustrated in Appendix B, Figure 2. This includes the milling process sources controlled by dust collector baghouses, the emergency generators to be used during the production phase, and the emergency fire pump engine.

Sources associated with the mine vent locations were placed using Appendix B, Figure 3. It displays the location of the Lower Exhaust Vent (EVL), Upper Exhaust Vent (EVU), and secondary escapeway where the emergency evacuation hoist powered by a 100-hp diesel engine is located.

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<sup>11</sup> The Mine Operating Permit Application can be found at this link: [http://deg.mt.gov/Portals/112/Land/Hardrock/Documents/TintinaRevisionIII/BBC%20Mine%20Operating%20Permit%20Revision%203\\_07-14-17.pdf](http://deg.mt.gov/Portals/112/Land/Hardrock/Documents/TintinaRevisionIII/BBC%20Mine%20Operating%20Permit%20Revision%203_07-14-17.pdf)



Portable sources include the 325-hp generator, 131-hp generator, set of four 100-hp generators, nine temporary propane heaters (each requiring a 32-hp engine), and eleven diesel-powered light plants (each requiring a 14-hp engine). The generator sets will be used for various jobs throughout the facility, so they were placed around the facility in areas to overpredict impacts. The 325-hp generator is located at the west end of the mill pad and the 131-hp generator is located near the Process Water Pond, both near the western property boundary. The complete set of four 100-hp generators was placed on the fenceline side of the Non-Contact Water Reservoir. The propane heaters will be used to provide temporary heat in areas throughout the facility. They have been placed in sets of three throughout the facility in the model to mimic sources of heat for jobs occurring near the development phase workshop, the production phase truck shop, and the crushing and screening facility near the Temporary Construction Stockpile. The light plants will also be spread around the facility. They have been partitioned in the model with two sets of light plants at two different mine road intersections, three light plants at the Temporary Construction Stockpile, and four light plants at the portal pad.

### **6.2.2 Emission Rates**

Emission rate calculations are detailed in Section 3 and in Appendix C of this report. All sources are modeled to operate at full capacity (8760 hours per year) unless further noted.

The mine vent heaters are located at the intake airway vents; however, they are direct heaters that exhaust emissions along with the produced heat into the underground mine area. Consequently, the emissions from the heaters will be entrained in the mine ventilation system and will be exhausted the mine exhaust vents. The heaters are modeled to operate from October through April in the model by using the “Month” emission factor selection under the Factor tab in the Source Options. Thus, the pound per hour emission rate for the heaters was modeled to only operate from October through April.

Four emergency generators will reside on the proposed Tintina mine site and will only operate at a maximum of 500 hours per year. They will only operate in the event of an emergency or when undergoing short, scheduled maintenance procedures to ensure they are operational. Since they will only operate in the event of an emergency or when undergoing short, infrequent maintenance procedures to ensure they are operational, the emergency generators were modeled separately from regularly occurring mine activities and equipment. Additionally, mine activities will cease in the event of an emergency so other sources of emissions will not occur during emergency procedures. Due to the unpredictable nature of emergency operations the generators were modeled to simulate operation for two consecutive but arbitrary hours per day. This scenario provides an overestimation of emergency operations since it totals 728 hours of operation a year – exceeding their operational limit by 228 hours each year. This scenario was modeled using the “Hour of Day 7” option in the Factors tab of the Source Options.

Note that the 545-kW and 320-kW generators are modeled at 8760 hours of operation per year. As stated in Section 6.2.1, these two generators will produce power on the portal

pad during the development phase until line power is connected to the facility. The 545-kW generator will primarily be used to provide power while the 320-kW will be used as a backup. Regardless, both engines have been modeled at full capacity to provide an overrepresentation of mine operation.

Fugitive sources of emissions from excavation, embankment construction, wind erosion, pile disturbance, and material transferring were calculated as independent processes as detailed in the Emissions Inventory in Appendix C. The independent calculations are based on the amount of material to be processed for each activity and were grouped for input into the model by the location of each activity. For example, all emissions calculated for the independent processes at the Process Water Pond (PWP) were summed into the four volume sources encompassing the entire area where the processes will occur at the PWP. The modeled sources are as follows:

PWP Modeled Emission Sources: PWP\_T\_1, PWP\_T\_2, PWP\_T\_3, PWP\_T\_4

These modeled sources account for the emissions calculated in the emissions inventory as follows:

Associated emissions inventory processes:

F8: Dozing for Embankment Construction

F16: Soil Removal

F8\_T\_PWP: Material Transfer Haul Truck to PWP

F16\_PWP\_T: Material Transfer from PWP to Haul Truck

The calculations for each process are included at the bottom of the material processing pages of the emissions inventory (F6 through F25). The activities associated with each volume source are included in Appendix E. The Non-Road Fugitive Source Key provides a list of each individual activity associated with the fugitive emission sources in the model. The activities are listed by a process description and an Activity ID that can be linked to the individual emission calculation detailed in the emissions inventory (Appendix C).

Additionally, fugitive sources of emissions from excavation, embankment construction, and material transferring are calculated in the emissions inventory on a 12 hour per day operational basis. However, these operational constraints were not included in the model. The hourly emission rate was input for all the “12 hour per day” sources but were modeled at 8760 hours of operation per year. This effectively doubles the amount of emissions in the model than what is represented in the emissions inventory. The hourly rates in the emissions inventory are calculated from the annual rate and converting the annual rate by 4380 hours of yearly operation, or twice the hourly rate if converted by 8760 hours of yearly operation. The “doubled” hourly rate based on 4380 hours/year is then input into the model to simulate that rate occurring every hour for 8760 hours per year rather than applying the “Hour of Day 7” factors like the emergency engines to only model the emissions for 12 hours per day. This again provides an overestimation of all emissions resulting from excavation, embankment construction, and material transferring.

Access road emissions account for the two access roadways on the mine property. Emissions for years 0 to 2 (Emissions Inventory F29) are input into the Construction Access Road. This is an overestimation of mine vehicle traffic along that roadway since vehicle volume will be shared with the Main Access Road. Emissions for years 2 to 15 (Emissions Inventory F30) are input into the Main Access Road and account for the largest amount of non-haul road emissions.

Haul road emission calculations are based on the amount of material hauled for each mine activity as defined by Tintina and the Vehicle Miles Traveled (VMT) for each activity. These activities are itemized on the emissions inventory page titled Road Dust Design Values. The amount of material hauled and the VMTs are listed for each activity. VMTs are based on the road segments utilized for each activity. The road segments and their distances are listed at the top of the Road Dust Design Values page. A Road Activity ID was created for each activity in the development and production phases to aid in partitioning out the total road emissions from a mine activity to a per volume source emission for each road segment. The Road Activity IDs are listed on the Road Dust Design Values page of the EI and the Haul Road Source Notations page in Appendix E. An example of a Road Activity ID is “DB2” corresponding to the Embankment Construction of the Portal Pad.

- D – Represents the Development Phase
- B – Represents the Embankment Construction Activity
- 2 – Represents the Portal Pad

A Road Activity ID Key and Road Activity ID Catalog are included on the Haul Road Source Notations page in Appendix E. The Road Activity ID Catalog can be matched to the activities listed on the Road Dust Design Values page of the emissions inventory.

As previously stated, each Road Activity ID corresponds to a calculated amount of emissions produced from haul road traffic completing that activity. Each Road Activity ID also corresponds to the number of cataloged road segments used to calculate the emissions. Each road segment provides the known road length and location within the model, thus creating the locations for haul road volume sources. However, certain Road Activity IDs use multiple road segments and road segments are used for multiple Road Activity IDs. An analysis was thus created to determine the appropriate amount of emissions for each volume source for each road segment in the model so that emissions were accurately distributed per source.

Each road segment was input into the model and volume sources were created for each road segment. The number of volume sources was then summed for each Road Activity ID by adding the number of volume sources for each road segment associated with each Road Activity ID. The number of volume sources per road segment and Road Activity ID is listed in the Haul Road Volume Source Apportionment page in Appendix E.

The emissions per volume source for each Road Activity ID were calculated in the emissions inventory by dividing the total road emissions for each Road Activity ID by the

number of volume sources associated with that Road Activity ID. These calculations are located at the bottom of the emission inventory pages for F1 Road Dust Year 0-1, F2 Road Dust Year 1-2, and F3 Road Dust Year 2-15.

Emissions were then apportioned per volume source for each road length on the page titled Haul Road Emissions Apportioned by Volume Source in Appendix E. Each road length is listed on the page with their associated Road Activity ID. The emissions per volume source for each Road Activity ID are also listed as calculated in the emissions inventory. The emissions per volume source for each Road Activity ID are then summed for each associated road segment to calculate the emissions per individual volume source for each road segment. These emissions are placed into the model to simulate the appropriate haul road emissions for each road segment.

The only location where the method for calculating haul road emissions was adjusted is at the southwest section of the Mine Operating Boundary area where the road branches to access the Topsoil Stockpile. Emissions were adjusted to account for the material being hauled to the Topsoil Stockpile rather than the Subsoil and South Reclamation Materials Stockpile. Road Activity IDs DA2, DAC, DAO, DAW, DAM, DAP, DAT, and DHW account for material transferred to the Topsoil and Subsoil stockpiles. Emissions from those activities were halved to account for material going to both soil piles. Emissions from hauling material to the South Reclamation Materials Stockpile (Road Activity ID DDT) remained in the volume sources on the road to the South Reclamation Materials and Subsoil stockpiles.

### **6.2.3 Release Parameters**

Emission source characteristics are further detailed in the Appendix E document titled Model Source Catalog.

#### **Point Sources**

At this time Tintina is unaware of the specific make and model of the engines that will be located at the facility. Source parameters are based on manufacturer specifications for similarly rated engine units. For instance, the parameters of stack height, diameter, temperature, and flow rate for the 914-hp diesel engine generator set are characteristic of a 914-hp engine that will be placed on-site. This accounts for all engines associated with generators, emergency fire pump, diesel heaters, propane heaters (32-hp engine each), air compressor (275-hp engine), and light plants (14-hp engine each). Stack heights are based on the height of the engine or generator containment dimensions. The 1000-kW emergency generators have an additional stack attached because they will be placed on the mill pad and be stationary for the duration of the production phase.

Sources utilizing baghouse dust collectors will emit from stacks on the mill pad or the west end of the portal pad (jaw crusher). Dust collector stack parameters and flowrates are technical values provided by Tintina and are based on the processes being controlled. All baghouse sources control enclosed spaces including the jaw crusher and associated screen. All stacks will emit at ambient temperature which was input as 0 Kelvin (-273.15°

Celsius) in AERMOD because it directs the program to use the ambient temperature in the AERMET file for that time period.

The portal and exhaust vents are modeled as point sources because they will be structures constructed with the purpose of directing exhaust gas with a designed flowrate. The portal opening will be constructed into a hillside to allow for haul traffic to enter the underground mine. Consequently, it is input as a horizontal stack release to characterize appropriate emissions releases. The opening will be 17-feet in diameter and is modeled accordingly. The mine exhaust vents will be constructed vertically upwards from the EVU and EVL zones and are modeled as vertical stack releases. They will both be 16-feet in diameter. Ventilation flow is apportioned to the three exhaust locations and their flow rates are calculated in standard cubic feet per minute (scfm) and actual cubic feet per minute (acfm) in the Underground Sources section of the emissions inventory. The exhaust gas will be warmed by the underground mining processes and will be around 70°F. The emissions from the propane heaters at the intake vents will emit through the exhaust vents at the same stack characteristics. These sources were input into the model at the same location and parameters as the mine exhaust vent sources.

### *Volume Sources*

All volume sources are calculated based on EPA guidance for determining release heights, initial vertical dimensions, and initial horizontal dimensions. Sources are either represented by single volume sources or a line of adjacent volume sources. They are also all surface-based sources.

Volume source characteristics for the portable screen and crushing units located at the Temporary Construction Stockpile are based on dimensions for similarly sized equipment – 250 ton per hour conical crusher and 400 ton per hour screens. Similar to the engine sources, Tintina is unaware of the specific make and model of these units at this time.

The non-road fugitive emission sources account for soil removal, excavation, embankment construction, wind erosion, pile disturbance, and transfers to and from haul trucks. Emissions are grouped into sources encompassing the areas of activity. For example, the Contact Water Pond (CWP) will be the location of soil removal (Emission Inventory, EI, ID F16), excavation of materials to be hauled to the North Reclamation Material Stockpile (EI ID F13), and transfers into haul trucks (EI IDs F13 and F16). The earthwork will occur over the entire area of the future CWP location. Three volume sources span the area of the CWP to account for the associated fugitive emissions since we cannot predict where emissions will occur at a particular time of the modeling period. The horizontal component of these volume sources is based on the length of the affected area divided by the number of volume sources accounting for that area. So, the CWP is approximately 230 meters in length and utilizes three volume sources. Each initial horizontal dimension is thus based on a horizontal length of 76.67 meters ( $230 / 3 = 76.67$ ). Each of these volume sources was calculated with characteristics based on single, surface-based volume sources rather than line sources represented by several

adjacent sources because each source will occur individually over mine development. These calculations are detailed in the Model Source Catalog.

The vertical components for the non-road fugitive sources are dependent on whether it is necessary to account for pile height. Sources that account for soil removal, excavation, and transfers to haul trucks are based on the vertical dimension of a dozer utilized in soil removal and excavation. Transfers to haul trucks will likely be accomplished with front-end loaders; however, using dozer vertical dimensions provides a conservative overestimate of impacts by creating a shorter release height. The release height and initial vertical dimension components for these sources are based on bulldozer height dimensions and are indicated in the Model Source Catalog. Sources that account for stockpile height, such as wind erosion, pile disturbance, and transfer to piles utilize the height of the pile as the vertical component in order to interpret the action of these activities at varying vertical locations of the stockpiles. The release heights and initial vertical dimensions for these sources are based on the height of associated stockpile and are indicated in the Model Source Catalog.

Road volume sources for fugitive dust emissions are based on the width of each roadway and the type of vehicle used to represent vehicle travel on the road. All road sources are represented by lines of adjacent, surface-based volume sources and are separated by the length of the vehicle.

Haul roads are based on the dimensions for a 42 to 44-ton target payload haul truck. The release height and initial vertical dimensions are based on the height of the truck and the sources are separated by the length of the trucks. Initial horizontal dimensions are calculated differently for the CTF road and service roads. The CTF road runs from the portal pad along the northern edge of the mill pad and then southeast to the CTF (Figure 1). There will also be short branches off the CTF road to access the Waste Rock Storage (WRS) and copper-enriched rock (Cu Pile) stockpile pads. The CTF road will be two lanes so the initial horizontal dimension for the associated volume sources is based on the road width of 10 meters or approximately 32.8 feet. Service haul roads provide access to the Process Water Pond, Non-Contact Water Reservoir, Contact Water Ponds, and Topsoil and Subsoil storage areas. They will have a roadbed with a 16-foot width that allows for single lane traffic. Consequently, volume sources for the service haul roads have an initial horizontal dimension based on the width of the haul truck per EPA guidance. Road segments representing the CTF Roads and service roads are indicated in the Model Source Catalog.

Access roads are based on the dimensions for a Class 6 Heavy Truck – such as an International Durastar – because it represents the mean vehicle weight for traffic along both roadways. The release height and initial vertical dimension inputs are based on the vehicle dimensions and the sources are spaced by the vehicle length. The Main Access Road will be two lanes, each 12 feet wide, with a minimum 1-foot shoulder; therefore, the initial horizontal dimension for the volume sources is based on a road width of 26 feet. The temporary Construction Access Road is based on the existing roadway entering the facility from Butte Creek Road. It is a single lane roadway so the initial horizontal

dimensions for these sources are based on the width of a Class 6 Heavy Truck. All road sources are additionally explained in the Model Source Catalog.

### 6.2.4 Surrounding Sources

Cumulative impacts modeling for comparison to the PSD Increments (again, not applicable in this case) and NAAQS require the modeling of significant surrounding sources to evaluate cumulative air quality standards impacts. This could include minor or major sources within Tintina's significant impact area (SIA). No significant sources were located within the area surrounding the SIAs for each pollutant. The spatial limits of AERMOD were taken into consideration while screening for surrounding sources due to the model being capable of estimating impacts up to 50 kilometers of the edge of the SIAs.

## 6.3 AERMOD Technical Options

Regulatory default selections were used for the technical options in all modeling runs. Options selected within the regulatory default framework relate to output options, formatting, and NO<sub>2</sub> / NO<sub>x</sub> conversion parameters. Output formats will provide MDEQ with a model output grid for each pollutant and averaging period.

### 6.3.1 Receptor Grid

A Cartesian receptor grid was used for combined SIL and NAAQS modeling analyses. The analyses were assessed concurrently in order to reduce computer processing time. The receptor grids extent and spacing are defined as follows and are reported as nominal values. The BEEST graphical user interface program was used to automatically create rectangular receptor grids around the property boundary based on these input parameters:

Fenceline (Ambient Air Boundary):	50-meter spacing
Fenceline to 1,000 meters:	100-meter spacing
1,000 to 3,000 meters:	250-meter spacing
3,000 to 10,000 meters:	500-meter spacing
10,000 to 20,000 meters:	1,000-meter spacing

NOTE: The outermost grid was reduced from 20,000 meters to an extent of 15,000 meters in order to reduce model runtime for the model runs assessing particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) impacts. The particulate matter model runs include a large number of volume sources which increase processing time. The reduction in the outer extent only reduced the grid by approximately 960 receptors. The reduced grid adequately captured the extent of PM<sub>10</sub> and PM<sub>2.5</sub> impacts with the farthest 24-hour PM<sub>2.5</sub> SIL exceedance occurring approximately 7,600 meters from the fenceline and the 24-hour PM<sub>2.5</sub> NAAQS impact occurring at the facility fenceline. The fenceline impact does not exceed the 24-hour PM<sub>2.5</sub> NAAQS.

Additional receptors were placed along Sheep Creek Road and Butte Creek Road. Both county roadways intersect the property boundary and run adjacent to the fenceline. Receptors were placed with 50-meter spacing along the portions of both roads where they are located next to the fenceline to ensure impacts along the roadway were captured.

An analysis of modeling results using this complete grid configuration indicated that the receptor spacing was adequate to identify all peak impacts. No hotspot analyses were required. Additionally, it was determined that no refined grids were required to separately assess impacts at locations with high occupation frequencies.

### **6.3.2 Elevation Data**

Elevations of sources used in the modeling analyses were determined from preliminary general arrangement drawing elevations of the plant sites and AERMAP. Sources and structures located on the Mill Pad and Portal Pad were placed at the project construction grade of 1785 meters. All additional source elevations were calculated using AERMAP. Sources accounting for the fugitive emissions associated with the earthwork and construction of the Portal Pad and Mill Pad were set to AERMAP calculated values since those activities will occur at existing elevations to ultimately achieve the final construction grade of 1785 meters.

Receptor elevations and hill heights were determined using AERMAP. Elevation data was obtained from the USGS website in seamless NED files. NED files were downloaded spanning the modeling domain to calculate hill heights as determined by the BEEST domain calculation feature. The NED elevation file and AERMAP processor files are included on the modeling DVD submitted with this application package.

### **6.3.3 NO<sub>x</sub> to NO<sub>2</sub> Conversion**

NO<sub>2</sub>/NO<sub>x</sub> conversion was accounted for using the Ambient Ratio Method Version 2 (ARM2). ARM2 is a regulatory default option within AERMOD. The regulatory default values were selected for the ratio inputs with 0.5 for the minimum ratio and 0.9 for the maximum ratio.

### **6.3.4 Building Downwash and GEP Stack Heights**

Building influences on stacks were considered by incorporating the EPA Building Profile Input Program for PRIME (BPIP<sub>PRM</sub>). BPIP<sub>PRM</sub> is used in conjunction with AERMOD to characterize building downwash effects. According to program documentation, it is “designed to incorporate the two fundamental features associated with building downwash: enhanced plume dispersion coefficients due to the turbulent wake, and reduced plume rise caused by a combination of the descending streamlines in the lee of the building and the increased entrainment in the wake.” Stack and building heights in the dispersion model are the proposed heights or Good Engineering Practice (GEP) stack heights.



### 6.3.5 Meteorological Data

AERMOD requires hourly meteorological data with a minimum set of parameters such as temperature, wind speed, and wind direction to calculate concentration impacts. EPA modeling policy suggests the use of either one complete year of meteorological data collected near the site of the proposed project or five current years of NWS data collected at a NWS station within the general vicinity of the project. The final meteorological data input into AERMOD must be processed through the AERMET module. AERMET requires, at a minimum, one set of hourly surface observation data and a complementary set of twice-daily upper air sounding data. If on-site data is provided, AERMET will optionally accept additional NWS surface data that it uses to substitute data missing from the on-site set.

Data describing surface characteristics surrounding the surface meteorological station are an additional required input to AERMET. Seasonally and directionally varying data are available in the form of land cover data files available from the Multi-Resolution Land Characteristics Consortium. Files from the 1992 National Land Cover Database (NLCD1992)<sup>12</sup> were obtained for input into AERSURFACE, which reads the data and produces an AERMET input file with the required surface characteristics.

This modeling analysis used the above data types to produce AERMET meteorological files. A meteorological tower was constructed on mine property and has collected surface meteorological data since 2012. As a result, five years of on-site data were input into AERMET to assess on-site surface conditions from May 1, 2012, through April 30, 2017. Surface data from the Helena, MT NWS station (WBAN 24144) was used as supplemental surface data to substitute for missing data from the on-site dataset. Upper air data was utilized from the Great Falls, MT Upper Air station (WBAN 04102).

Following are basic descriptions of the data included in the AERMET meteorological datasets used for this modeling analysis. Additional detail is provided in the model-generated electronic files included on the DVD attached to the submittal copy of this application. “.SFC” and “.PFL” files are included in both individual year and concatenated datasets.

#### Tintina Meteorological Dataset

- On-site surface data: Tintina On-Site, 2012 – 2017
- Supplemental NWS surface data: Helena Regional Airport (KHLN) Airport, 2012 – 2017
- Upper air NWS data: Great Falls International Airport (GTF), 2012 – 2017
- Surface characteristics data: Tintina On-Site Location, 1992 data

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<sup>12</sup> Note that, although newer datasets are available, they are not currently supported by AERSURFACE.

### 6.3.6 Background Concentrations

Background concentrations are used if a cumulative NAAQS air impact modeling analysis is required. Ambient background concentrations are added to modeled impacts to demonstrate compliance with applicable NAAQS thresholds. MDEQ guidance states that the most current representative background information should be used in the modeling analysis. If ambient monitoring does not exist on-site, ambient data should be utilized from a monitoring station in an area of similar characteristics of the modeling domain site.

Tintina utilized criteria pollutant background concentrations collected at the Sieben Flats NCore monitoring station and the Lewistown monitoring station. The Sieben Flats station monitors background air quality data as a part of the National Core (NCore) multi-pollutant monitoring network which addresses monitoring objectives including long-term health assessments contributing to ongoing reviews of the NAAQS and the support of scientific research in public health, atmospheric science, and ecological science. The monitoring station resides approximately 17.7 miles north-northeast of Helena, Montana, in an area of rural, agricultural land characteristic to the region surrounding the BBCP. Monitoring data from the Sieben station was used for all pollutants collected at the station which included all criteria pollutants except for NO<sub>2</sub>. The Lewistown station provides another set of monitoring data characteristic to the BBCP location and was used for NO<sub>2</sub> and PM<sub>10</sub> background concentration values.

Background values were used from the State of Montana 2017 Air Quality Network Plan (2017 Network Plan) produced by MDEQ. The 2017 Network Plan provides summaries of monitoring concentrations for the NAAQS design values to be used for modeling assessments in comparison to the NAAQS standards. The design values are averaged from 2014 – 2016 and particulate values are adjusted to exclude exceptional events such as forest fires. The selected background concentrations are included in Table 6-4. Only concentrations are listed for pollutants and averaging periods that exceed the SILs as detailed in Section 6.4.1.

**Table 6-4: NAAQS Background Concentrations**

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Background<sup>(a)</sup> Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Monitoring Station</b>
PM <sub>10</sub> <sup>(b)</sup>	24-hour	0	Lewistown
PM <sub>2.5</sub> <sup>(b)</sup>	24-hour	10	Sieben Flatts NCORE
	Annual	2.5	Sieben Flatts NCORE
SO <sub>2</sub>	1-hour	5.24 <sup>(c)</sup>	Sieben Flatts NCORE
CO	1-hour	0	Sieben Flatts NCORE
NO <sub>2</sub>	1-hour	20.7 <sup>(d)</sup>	Lewistown
	Annual	1 <sup>(e)</sup>	Lewistown

(a) NAAQS design values provided in 2017 Network Plan produced by Montana DEQ.

(b) Values exclude DEQ defined exceptional events.

(c) Concentration represents 2 ppb.

(d) Concentration represents 11 ppb.

(e) Concentration represents 0.5 ppb. Value not a regulatory calculated. Internally calculated arithmetic mean provided in 2017 Network Plan. Used in lieu of no NO<sub>2</sub> Annual NAAQS Design Value.

## **6.4 Ambient Concentration Modeling Results**

### **6.4.1 Significant Impacts**

Significant impact modeling results establish the need for cumulative impacts analyses. If modeled impacts from proposed emissions exceed any respective SIL, additional analyses demonstrating cumulative ambient concentration impacts are typically required. SIL modeling results are compared to the applicable Class II SILs in Table 6-5. All concentrations are 1<sup>st</sup>-high values for comparison to the SILs.

**Table 6-5: Tintina Significant Impact Modeling Results**

Pollutant	Avg. Period	Modeled Conc. ( <sup>a</sup> ) (µg/m <sup>3</sup> )	Class II SIL (µg/m <sup>3</sup> )	Significant (Y/N)
PM <sub>10</sub>	24-hr	145	5	Y
PM <sub>2.5</sub>	24-hr	16.5	1.2	Y
	Annual	4.4	0.3	Y
NO <sub>2</sub>	1-hr	263	7.52 <sup>(b)</sup>	Y
	Annual	11.7	1	Y
SO <sub>2</sub>	1-hr	13.8	7.8 <sup>(c)</sup>	Y
	3-hr	20.5	25	N
	24-hr	3.6	5	N
	Annual	0.14	1	N
CO	1-hr	2725	2,000	Y
	8-hr	459.2	500	N

As indicated, Tintina’s potential emissions of 8-Hour CO and 3-Hour, 24-Hour, and Annual SO<sub>2</sub> do not exceed the respective SIL standards. However, cumulative impacts modeling was performed for the other pollutants where peak impacts exceed the SILs.

#### 6.4.2 Cumulative NAAQS and MAAQS Impacts

NAAQS and MAAQS compliance demonstrations require the inclusion of relevant nearby industrial sources as well as the background concentrations for each pollutant and averaging period for which the applicant source significantly impacts ambient concentrations. Applicable cumulative impacts modeling results are compared to the relevant MAAQS and NAAQS in Table 6-6. Modeled concentrations show the combined impacts from Tintina sources added to the appropriate background values as described in Section 6.3.6. No regional stationary sources exist in the surrounding impact area as described in Section 6.2.4. Ambient standards modeling for each pollutant/averaging-hour combination was conducted using the appropriate meteorological input dataset (individual year or concatenated data) and the appropriate modeling high-impact (High-1<sup>st</sup>-High, High-2<sup>nd</sup>-High, etc.).

**Table 6-6: Tintina Class NAAQS/MAAQS Modeling Results**

Pollutant	Avg. Period	Modeled Conc. ( $\mu\text{g}/\text{m}^3$ )	Background Conc. ( $\mu\text{g}/\text{m}^3$ )	Ambient Conc. ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )	% of NAAQS	MAAQS ( $\mu\text{g}/\text{m}^3$ )	% of MAAQS
PM <sub>10</sub>	24-hr	121 <sup>a</sup>	0	121	150	81%	150	81%
PM <sub>2.5</sub>	24-hr	11.9 <sup>b</sup>	10	21.9	35	63%	-----	-----
	Annual	4.4 <sup>c</sup>	2.5	6.9	12	57%	-----	-----
NO <sub>2</sub>	1-hr	131 <sup>d</sup>	20.7	151.7	188	81%	564	36% <sup>g</sup>
	Annual	11.7 <sup>c</sup>	1	12.7	100	13%	94	13%
SO <sub>2</sub>	1-hr	5.8 <sup>e</sup>	5.24	11.03	196	6%	1309	1%
CO	1-hr	1890 <sup>f</sup>	0	1890	40,000	5%	26,450	7%

- a. Modeled concentration is the high-6<sup>th</sup>-high modeled over a 5-year concatenated met period.
- b. Modeled concentration is the high-8<sup>th</sup>-high modeled over a 5-year concatenated met period.
- c. Modeled concentration is the highest annual average over the modeled five-year period.
- d. Modeled concentration is the high-8<sup>th</sup>-high modeled over a 5-year concatenated met period.
- e. Modeled concentration is the high-4<sup>th</sup>-high modeled over a 5-year concatenated met period.
- f. Modeled concentration is the high-2<sup>nd</sup>-high modeled over a 5-year concatenated met period.
- g. Modeled concentration is the high-2<sup>nd</sup>-high modeled impact over a 5-year concatenated met period. High-2<sup>nd</sup>-high concentration is 184  $\mu\text{g}/\text{m}^3$  and was not included in the table. With the addition of the 20.7  $\mu\text{g}/\text{m}^3$  background value the ambient impact is 36% of the MAAQS.

As indicated, Tintina’s potential emissions of CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> do not cause or contribute to an exceedance of the relevant MAAQS and NAAQS.

The only impacts close to the NAAQS threshold to merit the consideration of a hot spot analysis are the 1-hour NO<sub>2</sub> and 24-hour PM<sub>10</sub> results. The 1-hour NO<sub>2</sub> impact is located along the fenceline near Butte Creek Road. The 24-hour PM<sub>10</sub> impact is located along the fenceline near Sheep Creek Road. Both locations are adequately modeled considering that receptor density is high due to fenceline and road receptors creating spacing at 30 - 40 meters. As a result, no further hot spot analyses are required.

The impacts from 24-hour PM<sub>10</sub> and 1-hour NO<sub>2</sub> generally approach the NAAQS standards; however, it is important to note the very conservative approach in modeling a scenario that is an over-estimation of realistic yearly mine activity. The development phase and production phase activities were modeled concurrently and the activities within each phase are modeled for the years with the highest throughput or associated impacts. Additionally, all construction activities in the development phase are modeled simultaneously rather than depicting the dynamic nature of the mine development both spatially and temporally. Instead, the model accounts for all activities to occur at the same time over the course of the entire modeling period. Furthermore, the 545-kW and 320-kW generators will only provide power on the portal pad prior to the substation coming online. Additionally, the 545-kW unit will be the primary source of power until line power is provided to the site. The 320-kW generator will provide emergency backup power for the underground pumps, vent fans, and shop in the event the main generator power supply

is disrupted. Regardless, both generators are modeled at full capacity for the entire duration of the model providing another overestimation of impacts. In summary, an overestimation of all mine processes during the development and production phases of the BBCP do not cause or contribute to an exceedance of the relevant MAAQS and NAAQS.

### 6.4.3 Emergency Operations

The four emergency generators that will reside on the proposed Tintina mine site will only operate at a maximum of 500 hours per year. Since they will only operate in the event of an emergency or when undergoing short, infrequent maintenance procedures to ensure they are operational, the emergency generators were modeled separately from regularly occurring mine activities and equipment. Additionally, mine activities will cease in the event of an emergency so other sources of emissions will not occur during emergency procedures.

Due to the unpredictable nature of emergency operations the generators were modeled to simulate operation for two consecutive but arbitrary hours per day. This scenario provides an overestimation of emergency operations since it totals 728 hours of operation a year – exceeding their operational limit by 228 hours each year.

The SIL and NAAQS impacts are as follows:

**Table 6-7: Tintina Emergency Operation Significant Impact Modeling Results**

Pollutant	Avg. Period	Modeled Conc. <sup>(a)</sup> (µg/m <sup>3</sup> )	Class II SIL (µg/m <sup>3</sup> )	Significant (Y/N)
PM <sub>10</sub>	24-hr	1.4	5	N
PM <sub>2.5</sub>	24-hr	0.97	1.2	Y
	Annual	0.03	0.3	N
NO <sub>2</sub>	1-hr	240	7.52 <sup>(b)</sup>	N
	Annual	0.79	1	N
SO <sub>2</sub>	1-hr	5.6	7.8 <sup>(c)</sup>	N
	3-hr	3.8	25	N
	24-hr	0.48	5	N
	Annual	0.013	1	N
CO	1-hr	398	2,000	N
	8-hr	70	500	N

The only exceedance is the 24-Hour PM<sub>2.5</sub> SIL which was assessed for comparison with the NAAQS.

**Table 6-8: Tintina Emergency Operation NAAQS Modeling Results**

<b>Pollu- tant</b>	<b>Avg. Period</b>	<b>Modeled Conc. (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Background Conc. (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Ambient Conc. (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>NAAQS (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>% of NAAQS</b>	<b>MAAQS (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>% of MAAQS</b>
PM <sub>2.5</sub>	24-hr	0.4 <sup>a</sup>	10	10.4	35	30%	-----	-----

a. Modeled concentration is the high-8<sup>th</sup>-high modeled over a 5-year concatenated met period

As indicated, an overestimation of emergency operations at the mine does not exceed the 24-hour PM<sub>2.5</sub> NAAQS limit.

**APPENDIX A: MDEQ AIR QUALITY PERMIT APPLICATION  
FORMS**

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Montana Department  
of Environmental Quality

Air Quality Bureau • P.O. Box 200901 • Helena MT 59620-0901 • (406) 444-3490

## AIR QUALITY PERMIT APPLICATION FOR STATIONARY SOURCES

**Montana Department of Environmental Quality**  
Air Quality Bureau  
Permitting Services Section Supervisor  
1520 E. Sixth Avenue  
P.O. Box 200901  
Helena, MT 59620-0901  
Phone: (406) 444-3490 FAX (406) 444-1499  
Email: [DEQ-ARMB-Admin@mt.gov](mailto:DEQ-ARMB-Admin@mt.gov)

For State of Montana Use Only	
Permit Application #:	_____ AFS #: _____
Application Fee Paid with Application?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Amount Paid:	_____ Check #: _____

**Three** complete copies of this application, any associated fees, and the affidavit of publication of the attached public notice must be delivered to the address above. The application may be submitted electronically to the email address provided above; however, the application will not be considered complete until the appropriate permit application fee, affidavit of publication, and certification of truth, accuracy, and completeness are submitted to the Department. Any checks, affidavits, and certifications submitted separately from the application should be clearly identified. The applicant is encouraged to contact the Department with any questions related to this application form.

*Note: This application form should **not** be used for portable sources or oil and gas registrations. Permit application forms for portable sources and oil and gas registrations are available on the Department's website. Applications for Acid Rain permits must be made on nationally standardized forms available from the U.S. Environmental Protection Agency as well as through the Department's application for a Title V Operating Permit.*

### §1.0 General Facility Information and Site Description

§1.1 FACILITY NAME AND ADDRESS (As registered with the Montana Secretary of State)	
Company Name <u>Tintina Montana Inc.</u>	
Facility Name <u>Black Butte Copper Mine</u>	
Mailing Address	Physical Address (if different from mailing address)
<u>17 West Main St.; P.O. Box 431</u> Address	_____ Address
<u>White Sulphur Springs</u> <u>MT</u> <u>59645</u> City                                      State      Zip	_____ City                      _____      _____      State      Zip

<b>§1.2 Contact Information</b>				
	Name	Title	Telephone	Email
Owner	Tintina Montana, Inc.		406-547-3466	
Facility Manager	John Shanahan	President and CEO	406-547-3466	jshanahan@tintinaresources.com
Responsible Official	John Shanahan	President and CEO	406-547-3466	jshanahan@tintinaresources.com
Alternate Responsible Official				
Contact Person	Jerry Zieg	Senior Vice President of Exploration	406-547-3466	jzieg@tintinaresources.com
Alternate Contact Person				
<i>[Note: If email address is provided, the Department will send all permit notices (i.e. Preliminary Determination, Department Decision, and Final Permit) electronically.]</i>				

**§1.3 PERMIT TYPE (Check all that apply)**

**Montana Air Quality Permit (MAQP)**

- MAQP Permit Action:  New Facility       Modification to Existing Permit # \_\_\_\_\_ - \_\_\_\_\_
- Synthetic Minor (major source using federally enforceable permit conditions to avoid MACT, NSR, or Title V Operating Permit requirements)
- New Source Review
- Prevention of Significant Deterioration
- Nonattainment Area

**Air Quality Operating Permit (Title V)**

- Title V Permit Action:  Initial Air Quality Operating Permit
- Renewal of Air Quality Operating Permit #OP \_\_\_\_\_ - \_\_\_\_\_
- Modification of Air Quality Operating Permit #OP \_\_\_\_\_ - \_\_\_\_\_
- Minor Modification
- Significant Modification

*Note: The applicant must also send one copy of the Title V Operating Permit application to the EPA at the following address:*

Office of Partnerships and Regulatory Assistance  
 Air and Radiation Program  
 US EPA Region VIII 8P-AR  
 1595 Wynkoop St.  
 Denver, Colorado 80202-1129

***A statement certifying that a copy of the Title V Operating Permit application has been mailed to EPA must accompany the Title V Operating Permit application.***

**§1.4 Physical Location and Facility Information**

Qtr/Qtr Section	Sections	24, 25, and 36	Township	12 North	Range	6 East
		19, 29, 30, 31, and 32		12 North		7 East

Latitude (in decimal degrees) 46.77°      Longitude (in decimal degrees) -110.92°      County Meagher

Will the facility be operating in (or impacting) a nonattainment area?  Yes  No

*(Note: Maps of the state's nonattainment areas can be found at the following website: <http://deq.mt.gov/AirQuality/Planning/AirNonattainment.asp>.)*

If yes, which pollutant(s) is the area nonattainment for?

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Total Property Area (acres) 1888 acres (mine permit boundary)      Year Facility Began Operation at Site: New Facility

General Nature of Business: Copper Mining and Milling

Standard Industrial Classification (SIC) Codes(s): 1021

SIC Description(s): Metal Mining - Copper Ore

(Note: SIC Codes can be found at the following website: <http://www.osha.gov/pls/imis/sicsearch.html>.)

For MAQP only, **a drawing, sketch, or topographic map of appropriate scale must be submitted** (maximum scale 1"=500', measurement to the nearest 20'), showing at least the following:

- a. The property boundaries on which the source is located;
- b. The outlines and dimensions of all existing and proposed buildings and stacks;
- c. The locations of existing and proposed emitting units, including lat/long coordinates (in NAD83) and elevation (in feet above mean sea level) for each emitting unit. The emissions units and points should be identified as existing or proposed;
- d. Any nearby streets, highways, and waterbodies;
- e. Any nearby sensitive areas, such as schools, hospitals, parks, residential areas, etc.;
- f. A true north arrow; and
- g. A graphically displayed scale.

**See Appendix B**

**§1.5 Project Summary** (Not Required for Title V Operating Permit applications)

Overview of project, including any new or modified equipment (*attach additional information as necessary*):

The development and operation of a new underground copper mine and mill at the Black Butte Copper Project site, located 15 miles north of White Sulphur Springs. The project will produce and ship copper concentrate mined from both the upper and lower zones of the Johnny Lee copper deposit.

**Include a process flow diagram showing material balances.**

Construction/Installation Schedule:

Expected Construction Start Date: October 2018 (construction of decline) Expected Operation Start Date: Mid 2021

Duration (if a temporary source): \_\_\_\_\_

Optional Information:

Estimate of Capital Expenditure for Proposed Project: \$ \_\_\_\_\_

Estimate of Cost of Air Pollution Control Equipment: \$ \_\_\_\_\_

\_\_\_\_\_

## §2.0 Emitting Unit Listing

List all existing and proposed emitting units.

For Title V Operating Permits only, note all insignificant emission units.

Note: An **insignificant emissions unit** includes any activity or emissions unit that has the potential to emit less than 5 tons per year of any regulated pollutant, less than 500 pounds per year of lead, less than 500 pounds per year of a hazardous air pollutant, and is not regulated by an applicable requirement, such as a New Source Performance Standard (NSPS) or Maximum Achievable Control Technology (MACT) standard.

EMITTING UNIT		Pollution Control Device	New Source	Existing Source	Insignificant	
ID	Name				Yes	No
P1	250 TPH Portable Conical Crusher	Water suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P2	325-hp Portable Diesel Eng/Gen	NSPS Subpart IIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P3	2 – Portable Screens (400 TPH each)	Water suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P4	131-hp Portable Diesel Eng/Gen	NSPS Subpart IIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P5	545-kW/914-hp Portable Diesel Eng/Gen	NSPS Subpart IIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P6	320-kW/1675-hp Portable Diesel Eng/Gen	NSPS Subpart IIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P7	2- 1000-kW/1675-hp Diesel Eng/Gen - Emergency backup	NSPS Subpart IIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P8	100-hp Diesel Eng/Gen – Emergency evac hoists	NSPS Subpart IIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P9	50-hp Diesel Fire Pump – Emergency	NSPS Subpart IIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P10A	23 MMBtu/hr Propane-fired Heater – Intake Vent for Upper Copper Zone	Good combustion practices	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P10B	52 MMBtu/hr Propane-fired Heater – Intake Vent for Lower Copper Zone	Good combustion practices	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P11	3 Temporary diesel heaters at Portal - (1.2 MMBtu/hr total)	Good combustion practices	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
P12	3640 TPD Jaw Crusher	Building/Dust Collector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P13A	Mill Building (mill, lime storage, etc.)	Building/Dust Collector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P13B	Mill Building (lime area/slurry mix tank)	Building/Dust Collector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

P14	Surge Bin Discharge	Dust Collector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P15	Water Treatment Plant Lime Area	Dust Collector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P16A	Backfill Plant Cement/Fly Ash Hopper	Dust Filter/Collector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P16B	Backfill Plant Cement/Fly Ash Silo	Dust Filter/Collector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P17	4- Portable Diesel Eng/Gen (400-hp total)	NSPS Subpart IIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P18	Air Compressor - 275-hp Diesel Engine	NSPS Subpart IIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
UG	ANFO	Best operating practices	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F1	Road Dust, Mine Operating Year (MOY) 0 to 1	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F2	Road Dust, MOY 1 to 2	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F3	Road Dust, MOY 2 to 15, Annual Average	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F4	Road Dust, MOY 16 and 17, Annual Average	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F5	Road Dust, MOY 18	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F6	Material Transfer to Temporary Stockpile, MOY 0 to 1.5	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F7	Temporary Construction Stockpile	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F8	Embankment Construction, MOY 0 to 1.5	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F9	Backfill, Non-contact Water Reservoir (NCWR) Embankment Material to Cemented Tailings Facility (CTF), MOY 16 to 18	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F10	Material Transfer to South Stockpile, MOY 0 to 1	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F11	Excess Reclamation Stockpile (South)	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F12	Material Transfer from South Stockpile, MOY 16 to 17	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F13	Material Transfer to North Stockpile, MOY 0 to 1	Reasonable Precautions/Dust	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

		Suppression				
F14	Excess Reclamation Stockpile (North)	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F15	Material Transfer from North Stockpile, MOY 16 to 18	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F16	Soil Removal and Stockpiling, MOR 0 to 1	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F17	Topsoil Pile	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F18	Subsoil Pile	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F19	Soil Return, MOY 16 to 18	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F20	Copper-enriched Rock Drop to Stockpile, MOY 2 to 3	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F21	Copper-enriched Rock Stockpile (Mill Feed)	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F22	Waste Rock Drop at Waste Rock Storage (WRS) Pad, MOY 0 to 1.5, at CTF, MOY 1.5 to 4 and 8	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F23	Temporary WRS	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F24	Waste Rock Transfer from WRS to CTF, MOY 2 to 3	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F25	Waste Rock Storage Pad Reclamation, MOY 3	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F26	11 - 14-hp Portable Diesel-powered Light Plants	NSPS Subpart IIII	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F27	500-gal Gasoline Storage Tank (double-walled)	None	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F28	9 -Temporary Portable Propane-fired Heaters (37.8 MMBtu/hr total)	Good combustion practices	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F29	Road Dust, Construction Access Road, Year 0-2 Avg.	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F30	Road Dust, Main Access Road, Year 2-15 Avg.	Reasonable Precautions/Dust Suppression	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
IEU	Diesel Storage Tanks (250-gal, 500-gal, 10,000- gal)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



### §3.0 Emissions Inventory\*

\* *Note: Emissions are expressed to the nearest one-hundredth (or one-thousandth, in limited cases) for presentation and calculation purposes. Multiple digit accuracy should not be assumed*

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P1 Emitting Unit Name: 250 TPH Conical Crusher

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>1</sup>		Actual Emission Rate(s) (if applicable) <sup>2</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.30	1.31		
PM <sub>10</sub>	0.14	0.59		
PM <sub>2.5</sub>	0.03	0.11		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>1</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>2</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P2 Emitting Unit Name: 325 hp Portable Diesel Generator Engine

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>3</sup>		Actual Emission Rate(s) (if applicable) <sup>4</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>0.11</u>	<u>0.47</u>		
PM <sub>10</sub>	<u>0.11</u>	<u>0.47</u>		
PM <sub>2.5</sub>	<u>0.11</u>	<u>0.47</u>		
SO <sub>2</sub>	<u>0.04</u>	<u>0.17</u>		
NO <sub>x</sub>	<u>2.14</u>	<u>9.36</u>		
CO	<u>1.87</u>	<u>8.19</u>		
VOC	<u>0.80</u>	<u>3.52</u>		
Pb				
Other (specify): <u>CO<sub>2e</sub></u>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>3</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>4</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P3 Emitting Unit Name: 2 – Portable Screens (400 TPH each, emission rates are the total)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>5</sup>		Actual Emission Rate(s) (if applicable) <sup>6</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>1.76</u>	<u>7.71</u>		
PM <sub>10</sub>	<u>0.59</u>	<u>2.59</u>		
PM <sub>2.5</sub>	<u>0.04</u>	<u>0.18</u>		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>5</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>6</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P4 Emitting Unit Name: 131-hp Portable Diesel Generator Engine

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>7</sup>		Actual Emission Rate(s) (if applicable) <sup>8</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.06	0.28		
PM <sub>10</sub>	0.06	0.28		
PM <sub>2.5</sub>	0.06	0.28		
SO <sub>2</sub>	0.02	0.07		
NO <sub>x</sub>	0.86	3.77		
CO	1.08	4.72		
VOC	0.32	1.42		
Pb				
Other (specify): CO <sub>2e</sub>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>7</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>8</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P5 Emitting Unit Name: 545 kW/914-hp Portable Diesel Generator Engine

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>9</sup>		Actual Emission Rate(s) (if applicable) <sup>10</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>0.30</u>	<u>1.32</u>		
PM <sub>10</sub>	<u>0.30</u>	<u>1.32</u>		
PM <sub>2.5</sub>	<u>0.30</u>	<u>1.32</u>		
SO <sub>2</sub>	<u>0.11</u>	<u>0.49</u>		
NO <sub>x</sub>	<u>9.61</u>	<u>42.10</u>		
CO	<u>5.26</u>	<u>23.02</u>		
VOC	<u>2.26</u>	<u>9.88</u>		
Pb				
Other (specify): <u>CO<sub>2</sub>e</u>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>9</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>10</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P6 Emitting Unit Name: 320-kW/536-hp Diesel Generator Engine

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>11</sup>		Actual Emission Rate(s) (if applicable) <sup>12</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>0.18</u>	<u>0.77</u>		
PM <sub>10</sub>	<u>0.18</u>	<u>0.77</u>		
PM <sub>2.5</sub>	<u>0.18</u>	<u>0.77</u>		
SO <sub>2</sub>	<u>0.01</u>	<u>0.03</u>		
NO <sub>x</sub>	<u>3.53</u>	<u>15.45</u>		
CO	<u>3.09</u>	<u>13.52</u>		
VOC	<u>1.32</u>	<u>5.80</u>		
Pb				
Other (specify): CO <sub>2e</sub>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>11</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>12</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P7 Emitting Unit Name: 2 - 1000-kW/1675-hp Diesel Generator Engines (Emergency)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>13</sup>		Actual Emission Rate(s) (if applicable) <sup>14</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>1.10</u>	<u>0.28</u>		
PM <sub>10</sub>	<u>1.10</u>	<u>0.28</u>		
PM <sub>2.5</sub>	<u>1.10</u>	<u>0.28</u>		
SO <sub>2</sub>	<u>0.41</u>	<u>0.10</u>		
NO <sub>x</sub>	<u>35.25</u>	<u>8.81</u>		
CO	<u>19.28</u>	<u>4.82</u>		
VOC	<u>8.27</u>	<u>2.07</u>		
Pb				
Other (specify): CO <sub>2e</sub>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>13</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>14</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P8 Emitting Unit Name: 100-hp Diesel Generator Engine – (Emergency Evac Hoists)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>15</sup>		Actual Emission Rate(s) (if applicable) <sup>16</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>0.07</u>	<u>0.02</u>		
PM <sub>10</sub>	<u>0.07</u>	<u>0.02</u>		
PM <sub>2.5</sub>	<u>0.07</u>	<u>0.02</u>		
SO <sub>2</sub>	<u>0.01</u>	<u>0.00</u>		
NO <sub>x</sub>	<u>0.77</u>	<u>0.19</u>		
CO	<u>0.82</u>	<u>0.21</u>		
VOC	<u>0.25</u>	<u>0.06</u>		
Pb				
Other (specify): <u>CO<sub>2</sub>e</u>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>15</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>16</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.



### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P9 Emitting Unit Name: 50-hp Diesel Fire Pump (Emergency)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>17</sup>		Actual Emission Rate(s) (if applicable) <sup>18</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.03	0.01		
PM <sub>10</sub>	0.03	0.01		
PM <sub>2.5</sub>	0.03	0.01		
SO <sub>2</sub>	0.01	0.00		
NO <sub>x</sub>	0.39	0.10		
CO	0.41	0.10		
VOC	0.12	0.03		
Pb				
Other (specify): CO <sub>2e</sub>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>17</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>18</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P10A Emitting Unit Name: 23-MMBtu/hr Propane-fired Heater (Upper Copper Zone)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>19</sup>		Actual Emission Rate(s) (if applicable) <sup>20</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.18	0.45		
PM <sub>10</sub>	0.18	0.45		
PM <sub>2.5</sub>	0.18	0.45		
SO <sub>2</sub>	0.01	0.03		
NO <sub>x</sub>	3.27	8.33		
CO	1.89	4.80		
VOC	0.25	0.64		
Pb				
Other (specify): CO <sub>2e</sub>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>19</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>20</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P10B Emitting Unit Name: 52-MMBtu/hr Propane-fired Heater (Lower Copper Zone)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>21</sup>		Actual Emission Rate(s) (if applicable) <sup>22</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>0.40</u>	<u>1.01</u>		
PM <sub>10</sub>	<u>0.40</u>	<u>1.01</u>		
PM <sub>2.5</sub>	<u>0.40</u>	<u>1.01</u>		
SO <sub>2</sub>	<u>0.03</u>	<u>0.08</u>		
NO <sub>x</sub>	<u>7.40</u>	<u>18.83</u>		
CO	<u>4.27</u>	<u>10.86</u>		
VOC	<u>0.57</u>	<u>1.45</u>		
Pb				
Other (specify): <u>CO<sub>2</sub>e</u>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>21</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>22</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P11 Emitting Unit Name: 3 - Temporary Diesel Heaters - 1.2 MMBtu/hr total (Portal)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>23</sup>		Actual Emission Rate(s) (if applicable) <sup>24</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>0.01</u>	<u>0.05</u>		
PM <sub>10</sub>	<u>0.01</u>	<u>0.05</u>		
PM <sub>2.5</sub>	<u>0.01</u>	<u>0.05</u>		
SO <sub>2</sub>	<u>0.02</u>	<u>0.08</u>		
NO <sub>x</sub>	<u>0.17</u>	<u>0.75</u>		
CO	<u>0.04</u>	<u>0.19</u>		
VOC	<u>0.00</u>	<u>0.02</u>		
Pb				
Other (specify): CO <sub>2e</sub>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>23</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>24</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P12 Emitting Unit Name: Jaw Crusher (3640 TPD) Building/Dust Collector

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>25</sup>		Actual Emission Rate(s) (if applicable) <sup>26</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.73	3.19		
PM <sub>10</sub>	0.73	3.19		
PM <sub>2.5</sub>	0.73	3.19		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>25</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>26</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P13A Emitting Unit Name: Mill Building (mill, lime storage, etc.) Dust Collector

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>27</sup>		Actual Emission Rate(s) (if applicable) <sup>28</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.04	0.19		
PM <sub>10</sub>	0.04	0.19		
PM <sub>2.5</sub>	0.04	0.19		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>27</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>28</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P13B Emitting Unit Name: Mill Building (lime area/slurry mix tank) Dust Collector

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>29</sup>		Actual Emission Rate(s) (if applicable) <sup>30</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.28	1.24		
PM <sub>10</sub>	0.28	1.24		
PM <sub>2.5</sub>	0.28	1.24		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>29</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>30</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P14 Emitting Unit Name: Surge Bin Discharge Dust Collector

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>31</sup>		Actual Emission Rate(s) (if applicable) <sup>32</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.43	1.88		
PM <sub>10</sub>	0.43	1.88		
PM <sub>2.5</sub>	0.43	1.88		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>31</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>32</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.



### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P15 Emitting Unit Name: Water Treatment Plant/Lime Area Dust Collector

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>33</sup>		Actual Emission Rate(s) (if applicable) <sup>34</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.28	1.24		
PM <sub>10</sub>	0.28	1.24		
PM <sub>2.5</sub>	0.28	1.24		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>33</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>34</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P16A Emitting Unit Name: Backfill Plant Cement/Fly Ash Hopper Dust Filter/Collector

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>35</sup>		Actual Emission Rate(s) (if applicable) <sup>36</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.05	0.23		
PM <sub>10</sub>	0.05	0.23		
PM <sub>2.5</sub>	0.05	0.23		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>35</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>36</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P16B Emitting Unit Name: Backfill Plant Cement/Fly Ash Silo Dust Filter/Collector

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>37</sup>		Actual Emission Rate(s) (if applicable) <sup>38</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>0.10</u>	<u>0.45</u>		
PM <sub>10</sub>	<u>0.10</u>	<u>0.45</u>		
PM <sub>2.5</sub>	<u>0.10</u>	<u>0.45</u>		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>37</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>38</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P17 Emitting Unit Name: 4 - Portable Diesel Generator Engines (total 400 hp)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>39</sup>		Actual Emission Rate(s) (if applicable) <sup>40</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>0.26</u>	<u>1.15</u>		
PM <sub>10</sub>	<u>0.26</u>	<u>1.15</u>		
PM <sub>2.5</sub>	<u>0.26</u>	<u>1.15</u>		
SO <sub>2</sub>	<u>0.05</u>	<u>0.21</u>		
NO <sub>x</sub>	<u>3.09</u>	<u>13.54</u>		
CO	<u>3.29</u>	<u>14.40</u>		
VOC	<u>0.99</u>	<u>4.33</u>		
Pb				
Other (specify): CO <sub>2e</sub>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>39</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>40</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: P18 Emitting Unit Name: 275-hp Diesel Engine – Air Compressor

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>41</sup>		Actual Emission Rate(s) (if applicable) <sup>42</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.09	0.40		
PM <sub>10</sub>	0.09	0.40		
PM <sub>2.5</sub>	0.09	0.40		
SO <sub>2</sub>	0.03	0.15		
NO <sub>x</sub>	1.81	7.92		
CO	1.58	6.93		
VOC	0.68	2.98		
Pb				
Other (specify): CO <sub>2e</sub>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>41</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>42</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: UG Emitting Unit Name: ANFO

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>43</sup>		Actual Emission Rate(s) (if applicable) <sup>44</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.02	0.11		
PM <sub>10</sub>	0.01	0.06		
PM <sub>2.5</sub>	0.00	0.00		
SO <sub>2</sub>	0.35	1.55		
NO <sub>x</sub>	3.01	13.19		
CO	11.86	51.97		
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>43</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>44</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F1 Emitting Unit Name: Road Dust, Mine Operating Year (MOY) 0 to 1

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>45</sup>		Actual Emission Rate(s) (if applicable) <sup>46</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	34.86	152.70		
PM <sub>10</sub>	8.89	38.92		
PM <sub>2.5</sub>	0.89	3.90		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>45</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>46</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F2 Emitting Unit Name: Road Dust, MOY 1 to 2

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>47</sup>		Actual Emission Rate(s) (if applicable) <sup>48</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	12.88	56.42		
PM <sub>10</sub>	3.28	14.38		
PM <sub>2.5</sub>	0.33	1.44		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>47</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>48</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.



### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F3 Emitting Unit Name: Road Dust, MOY 2 to 15, Annual Average

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>49</sup>		Actual Emission Rate(s) (if applicable) <sup>50</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	4.06	17.79		
PM <sub>10</sub>	1.04	4.53		
PM <sub>2.5</sub>	0.10	0.45		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>49</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>50</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F4 Emitting Unit Name: Road Dust, MOY 16 to 17, Annual Average

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>51</sup>		Actual Emission Rate(s) (if applicable) <sup>52</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	16.85	73.80		
PM <sub>10</sub>	4.30	18.81		
PM <sub>2.5</sub>	0.43	1.88		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>51</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>52</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F5 Emitting Unit Name: Road Dust, MOY 18

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>53</sup>		Actual Emission Rate(s) (if applicable) <sup>54</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>2.67</u>	<u>11.68</u>	_____	_____
PM <sub>10</sub>	<u>0.68</u>	<u>2.98</u>	_____	_____
PM <sub>2.5</sub>	<u>0.07</u>	<u>0.30</u>	_____	_____
SO <sub>2</sub>	_____	_____	_____	_____
NO <sub>x</sub>	_____	_____	_____	_____
CO	_____	_____	_____	_____
VOC	_____	_____	_____	_____
Pb	_____	_____	_____	_____
Other (specify):	_____	_____	_____	_____
Other (specify):	_____	_____	_____	_____
Other (specify):	_____	_____	_____	_____
Other (specify):	_____	_____	_____	_____
Other (specify):	_____	_____	_____	_____
Other (specify):	_____	_____	_____	_____

<sup>53</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>54</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F6 Emitting Unit Name: Material Transfer to Temporary Stockpile, MOY 0 to 1.5

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>55</sup>		Actual Emission Rate(s) (if applicable) <sup>56</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	1.43	3.13		
PM <sub>10</sub>	0.42	0.91		
PM <sub>2.5</sub>	0.14	0.30		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>55</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>56</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F7 Emitting Unit Name: Temporary Construction Stockpile

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>57</sup>		Actual Emission Rate(s) (if applicable) <sup>58</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.00	0.002		
PM <sub>10</sub>	0.00	0.001		
PM <sub>2.5</sub>	0.00	0.000		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>57</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>58</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F8 Emitting Unit Name: Embankment Construction, MOY 0 to 1.5

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>59</sup>		Actual Emission Rate(s) (if applicable) <sup>60</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	1.43	3.13		
PM <sub>10</sub>	0.42	0.91		
PM <sub>2.5</sub>	0.14	0.30		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>59</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>60</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F9 Emitting Unit Name: Backfill, Non-contact Water Reservoir (NCWR) Embankment Material to Cemented Tailings Facility (CTF), MOY 16 to 18

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C.

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>61</sup>		Actual Emission Rate(s) (if applicable) <sup>62</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.81	1.78		
PM <sub>10</sub>	0.24	0.52		
PM <sub>2.5</sub>	0.08	0.17		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>61</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>62</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F10 Emitting Unit Name: Material Transfer to South Stockpile, MOY 0 to 1

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>63</sup>		Actual Emission Rate(s) (if applicable) <sup>64</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.68	1.49		
PM <sub>10</sub>	0.20	0.43		
PM <sub>2.5</sub>	0.06	0.14		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>63</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>64</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.



### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F11 Emitting Unit Name: Excess Reclamation Stockpile (South)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>65</sup>		Actual Emission Rate(s) (if applicable) <sup>66</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.00	0.002		
PM <sub>10</sub>	0.00	0.001		
PM <sub>2.5</sub>	0.00	0.000		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>65</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>66</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F12 Emitting Unit Name: Material Transfer from South Stockpile, MOY 16 to 17

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>67</sup>		Actual Emission Rate(s) (if applicable) <sup>68</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.68	1.49		
PM <sub>10</sub>	0.20	0.43		
PM <sub>2.5</sub>	0.06	0.14		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>67</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>68</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F13 Emitting Unit Name: Material Transfer to North Stockpile, MOY 0 to 1

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>69</sup>		Actual Emission Rate(s) (if applicable) <sup>70</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.97	2.13		
PM <sub>10</sub>	0.28	0.62		
PM <sub>2.5</sub>	0.09	0.20		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>69</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>70</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F14 Emitting Unit Name: Excess Reclamation Stockpile (North)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>71</sup>		Actual Emission Rate(s) (if applicable) <sup>72</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.00	0.002		
PM <sub>10</sub>	0.00	0.001		
PM <sub>2.5</sub>	0.00	0.000		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>71</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>72</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F15 Emitting Unit Name: Material Transfer from North Stockpile, MOY 16 to 18

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>73</sup>		Actual Emission Rate(s) (if applicable) <sup>74</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.37	0.82		
PM <sub>10</sub>	0.11	0.24		
PM <sub>2.5</sub>	0.04	0.08		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>73</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>74</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F16 Emitting Unit Name: Soil Removal and Stockpiling, MOR 0 to 1

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>75</sup>		Actual Emission Rate(s) (if applicable) <sup>76</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	2.28	4.99		
PM <sub>10</sub>	0.66	1.45		
PM <sub>2.5</sub>	0.22	0.47		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>75</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>76</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F17 Emitting Unit Name: Topsoil Pile

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>77</sup>		Actual Emission Rate(s) (if applicable) <sup>78</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.00	0.002		
PM <sub>10</sub>	0.00	0.001		
PM <sub>2.5</sub>	0.00	0.000		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>77</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>78</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F18 Emitting Unit Name: Subsoil Pile

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>79</sup>		Actual Emission Rate(s) (if applicable) <sup>80</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.00	0.002		
PM <sub>10</sub>	0.00	0.001		
PM <sub>2.5</sub>	0.00	0.000		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>79</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>80</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.



### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F19 Emitting Unit Name: Soil Return, MOY 16 to 18

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>81</sup>		Actual Emission Rate(s) (if applicable) <sup>82</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	1.91	4.17		
PM <sub>10</sub>	0.55	1.21		
PM <sub>2.5</sub>	0.18	0.39		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>81</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>82</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F20 Emitting Unit Name: Copper-enriched Rock Drop to Stockpile, MOY 2 to 3

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>83</sup>		Actual Emission Rate(s) (if applicable) <sup>84</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.04	0.16		
PM <sub>10</sub>	0.01	0.06		
PM <sub>2.5</sub>	0.01	0.06		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>83</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>84</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F21 Emitting Unit Name: Copper-enriched Rock to Stockpile (Mill Feed)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>85</sup>		Actual Emission Rate(s) (if applicable) <sup>86</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.00	0.003		
PM <sub>10</sub>	0.00	0.002		
PM <sub>2.5</sub>	0.00	0.000		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>85</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>86</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F22 Emitting Unit Name: Waste Rock Drop at Waste Rock Storage (WRS) Pad, MOY 0 to 1.5, at CTF, MOY 1.5 to 4 and 8

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>87</sup>		Actual Emission Rate(s) (if applicable) <sup>88</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.20	0.87		
PM <sub>10</sub>	0.08	0.35		
PM <sub>2.5</sub>	0.08	0.35		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>87</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>88</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F23 Emitting Unit Name: Temporary WRS

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>89</sup>		Actual Emission Rate(s) (if applicable) <sup>90</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.00	0.001		
PM <sub>10</sub>	0.00	0.000		
PM <sub>2.5</sub>	0.00	0.000		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>89</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>90</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F24 Emitting Unit Name: Waste Rock Transfer from WRS to CTF, MOY 2 to 3

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>91</sup>		Actual Emission Rate(s) (if applicable) <sup>92</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.32	1.39		
PM <sub>10</sub>	0.13	0.56		
PM <sub>2.5</sub>	0.13	0.56		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>91</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>92</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F25 Emitting Unit Name: Waste Rock Storage Pad Reclamation, MOY 3

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>93</sup>		Actual Emission Rate(s) (if applicable) <sup>94</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.75	1.65		
PM <sub>10</sub>	0.22	0.48		
PM <sub>2.5</sub>	0.07	0.16		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>93</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>94</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F26 Emitting Unit Name: 11 – 14-hp Portable Diesel-powered Light Plants (total)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>95</sup>		Actual Emission Rate(s) (if applicable) <sup>96</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>0.34</u>	<u>1.48</u>		
PM <sub>10</sub>	<u>0.34</u>	<u>1.48</u>		
PM <sub>2.5</sub>	<u>0.34</u>	<u>1.48</u>		
SO <sub>2</sub>	<u>0.00</u>	<u>0.01</u>		
NO <sub>x</sub>	<u>4.77</u>	<u>20.91</u>		
CO	<u>1.03</u>	<u>4.51</u>		
VOC	<u>0.38</u>	<u>1.67</u>		
Pb				
Other (specify): <u>CO<sub>2</sub>e</u>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>95</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>96</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.



### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F27 Emitting Unit Name: 500-gal Gasoline Storage Tank (double-walled)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>97</sup>		Actual Emission Rate(s) (if applicable) <sup>98</sup>	
	(Lb/ Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM				
PM <sub>10</sub>				
PM <sub>2.5</sub>				
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC	0.00	0.07		
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>97</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>98</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F28 Emitting Unit Name: 9 -Temporary Portable Propane-fired Heaters (37.8 MMBtu/hr total)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>99</sup>		Actual Emission Rate(s) (if applicable) <sup>100</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	<u>0.29</u>	<u>1.27</u>		
PM <sub>10</sub>	<u>0.29</u>	<u>1.27</u>		
PM <sub>2.5</sub>	<u>0.29</u>	<u>1.27</u>		
SO <sub>2</sub>	<u>0.02</u>	<u>0.10</u>		
NO <sub>x</sub>	<u>5.38</u>	<u>23.57</u>		
CO	<u>3.10</u>	<u>13.60</u>		
VOC	<u>0.41</u>	<u>1.81</u>		
Pb				
Other (specify): <u>CO2e</u>	GHG emissions are calculated based on total facility fuel usage, see Section 3.3 of the application			
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>99</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>100</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F29 Emitting Unit Name: Road Dust, Construction Access Road, Year 0-2 Avg.

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>101</sup>		Actual Emission Rate(s) (if applicable) <sup>102</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	0.21	0.90		
PM <sub>10</sub>	0.05	0.23		
PM <sub>2.5</sub>	0.01	0.02		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>101</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>102</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: F30 Emitting Unit Name: Road Dust, Main Access Road, Year 2-15 Avg.

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer's data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>103</sup>		Actual Emission Rate(s) (if applicable) <sup>104</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM	23.33	102.19		
PM <sub>10</sub>	5.95	26.05		
PM <sub>2.5</sub>	0.60	2.61		
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC				
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>103</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>104</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

### §3.0 Emissions Inventory

A separate Section 3.0 must be completed for each emitting unit listed in Section 2.0.

Emitting Unit ID: IEU1 Emitting Unit Name: Diesel Storage Tanks (250-gal, 500-gal, 10,000- gal)

Attach calculations.

The source(s) of all emissions estimates must be indicated (e.g. manufacturer’s data, AP-42, source tests, etc.)

If possible, calculations should be submitted electronically using an Excel spreadsheet.

See Appendix C

Regulated Air Pollutant	Allowable Emission Rate(s) <sup>105</sup>		Actual Emission Rate(s) (if applicable) <sup>106</sup>	
	(Lb/Hour)	(Tons/Year)	(Lb/Hour)	(Tons/Year)
PM				
PM <sub>10</sub>				
PM <sub>2.5</sub>				
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				
VOC	negligible	negligible		
Pb				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				
Other (specify):				

<sup>105</sup> Allowable emission rate(s) should equal the potential to emit, unless a federally enforceable permit limit is proposed. Potential emissions are to be calculated based on production at the maximum capacity for 8,760 hours per year. Only control practices or equipment which is proposed to be made federally enforceable may be used to limit the potential to emit of the unit.

<sup>106</sup> Actual emission rate(s) should equal the average rate at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P1 Emitting Unit Name: 250 TPH Portable Conical Crusher

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The crusher will process waste rock in the development phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30502001

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): LL
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Aggregate, metallic minerals, etc.

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make TBD Model TBD

Type \_\_\_\_\_ Size up to 250 TPH

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source (engine/generators are listed separately)

**§4.4 Fuel/Combustion Information: *Not applicable***

**§4.5 Emitting Unit Location – *Various, Portable Unit***

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information *(if applicable): Not applicable***

**§4.7 Approximate Operating Schedule:**

Hours/Day24 (permitted) Days/Week \_\_\_\_\_

Hours/Year8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression and reasonable precautions.

Primary Air Pollution Control Equipment Description (see above)

**§4.9 Shakedown Procedures *(not required for Title V Operating Permit applications)***

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis *(not required for Title V Operating permit applications)***

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement *(check all that apply)*:  BACT  LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis *(not required for Title V Operating Permit applications)***

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P2 Emitting Unit Name: 325-hp Portable Diesel Eng/Generator

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The generator will supply power to the conical crusher during the development phase.

Proposed Operational Limitations (*if any*) NSPS Subpart IIII, minimum Tier 3

Source Classification Code (SCC)/ Description: 20200102

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): IIII
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): ZZZZ which applies 40 CFR 60 Subpart IIII
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel fuel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

### §4.3 Process Identification

Make TBD Model NSPS Subpart IIII, Tier 3 minimum

Type \_\_\_\_\_ Size up to 325-hp

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_



Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) 325

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) diesel

**§4.5 Emitting Unit Location - Various, Portable Unit**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Downward Exit   | <input type="checkbox"/> Multiple Actual Stacks | <input type="checkbox"/> Fugitive Source |
| <input type="checkbox"/> Horizontal Exit | <input type="checkbox"/> Building Roof Vent     | <input type="checkbox"/> Process Vent    |
| <input type="checkbox"/> Vertical Exit   | <input type="checkbox"/> Vertical Exit with Cap |  |

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Use of NSPS Subpart IIII engines.

Primary Air Pollution Control Equipment Description:

Make NSPS Subpart IIII - Tier 3 Minimum Engines Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

**§4.9 Shakedown Procedures** (not required for Title V Operating Permit applications)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – Not applicable**

**§4.11 Emissions Control Analysis** (not required for Title V Operating permit applications)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (check all that apply):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (not required for Title V Operating Permit applications)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## 4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P3 Emitting Unit Name: 2 Portable Screens (400 TPH each)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The screens will process waste rock in the development phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30502002

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): LL
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Aggregate, metallic minerals, etc.

Average Process Rate (tons/hr, gal/hr, etc.) TBD

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) 2 Portable Screens – each rated at 400 TPH

**§4.3 Process Identification**

Make TBD Model TBD

Type \_\_\_\_\_ Size up to 800 TPH (total, 400 TPH each screen)

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source (engine/generators are listed separately)

**§4.4 Fuel/Combustion Information: *Not applicable***

**§4.5 Emitting Unit Location – *Various, Portable Unit***

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information *(if applicable): Not applicable***

**§4.7 Approximate Operating Schedule:**

Hours/Day24 (permitted) Days/Week \_\_\_\_\_

Hours/Year8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression and reasonable precautions.

Primary Air Pollution Control Equipment Description (see above)

**§4.9 Shakedown Procedures *(not required for Title V Operating Permit applications)***

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis *(not required for Title V Operating permit applications)***

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement *(check all that apply)*:  BACT  LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis *(not required for Title V Operating Permit applications)***

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P4 Emitting Unit Name: 131-hp Portable Diesel Eng/Generator

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The generator will supply power to the portable screens during the development phase.

Proposed Operational Limitations (*if any*) NSPS Subpart IIII, minimum Tier 3

Source Classification Code (SCC)/ Description: 20200102

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): IIII
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): ZZZZ which applies 40 CFR 60 Subpart IIII
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel fuel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

### §4.3 Process Identification

Make TBD Model NSPS Subpart IIII, Tier 3 minimum

Type \_\_\_\_\_ Size up to 131-hp

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) 131

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) diesel

**§4.5 Emitting Unit Location - Various, Portable Unit**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Use of NSPS Subpart IIII engines.

Primary Air Pollution Control Equipment Description:

Make NSPS Subpart IIII - Tier 3 Minimum Engines Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

**§4.9 Shakedown Procedures (not required for Title V Operating Permit applications)**

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P5 Emitting Unit Name: 545 kW/914-hp Diesel Eng/Generator

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The generator will supply power to the facility during the development phase and backup power during the production phase.

Proposed Operational Limitations (*if any*) NSPS Subpart IIII, minimum Tier 3

Source Classification Code (SCC)/ Description: 20200102

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): IIII
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): ZZZZ which applies 40 CFR 60 Subpart IIII
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel fuel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

### §4.3 Process Identification

Make TBD Model NSPS Subpart IIII, Tier 3 minimum

Type \_\_\_\_\_ Size up to 914-hp

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_



If applicable, provide the following generator information:

Rated Output of the generator (kW) 545

Rated Size of Engine powering the generator (hp) 914

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) diesel

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted development), 500 in production Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Use of NSPS Subpart IIII engines.

Primary Air Pollution Control Equipment Description:

Make NSPS Subpart IIII - Tier 3 Minimum Engines Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

**§4.9 Shakedown Procedures (not required for Title V Operating Permit applications)**

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P6 Emitting Unit Name: 320-kW/536-hp Diesel Eng/Generator

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The generator will supply power to the facility during the development phase and backup power during the production phase.

Proposed Operational Limitations (*if any*) NSPS Subpart IIII, minimum Tier 3

Source Classification Code (SCC)/ Description: 20200102

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): IIII
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): ZZZZ which applies 40 CFR 60 Subpart IIII
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel fuel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

### §4.3 Process Identification

Make TBD Model NSPS Subpart IIII, Tier 3 minimum

Type \_\_\_\_\_ Size up to 536-hp

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) 320

Rated Size of Engine powering the generator (hp) 536

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) diesel

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted development), 500 in production Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Use of NSPS Subpart IIII engines.

Primary Air Pollution Control Equipment Description:

Make NSPS Subpart IIII - Tier 3 Minimum Engines Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

**§4.9 Shakedown Procedures (not required for Title V Operating Permit applications)**

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P7 Emitting Unit Name: 2- 1000-kW/1675-hp Diesel Eng/Generators – Emergency

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The generators will supply backup/emergency power to the facility during the production phase.

Proposed Operational Limitations (*if any*) NSPS Subpart IIII, minimum Tier 3

Source Classification Code (SCC)/ Description: 20200102

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): IIII
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): ZZZZ which applies 40 CFR 60 Subpart IIII
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel fuel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

### §4.3 Process Identification

Make TBD Model NSPS Subpart IIII, Tier 3 minimum

Type \_\_\_\_\_ Size up to 1675-hp each

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) 1000 each

Rated Size of Engine powering the generator (hp) 1675 each

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) diesel

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Downward Exit   | <input type="checkbox"/> Multiple Actual Stacks | <input type="checkbox"/> Fugitive Source |
| <input type="checkbox"/> Horizontal Exit | <input type="checkbox"/> Building Roof Vent     | <input type="checkbox"/> Process Vent    |
| <input type="checkbox"/> Vertical Exit   | <input type="checkbox"/> Vertical Exit with Cap |  |

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 500 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Use of NSPS Subpart IIII engines.

Primary Air Pollution Control Equipment Description:

Make NSPS Subpart IIII - Tier 3 Minimum Engines Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

**§4.9 Shakedown Procedures (not required for Title V Operating Permit applications)**

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)



## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P8 Emitting Unit Name: 100-hp Portable Diesel Eng/Generator – Emergency Evac Hoists

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The generator will supply power to the emergency evacuation hoists as needed during production phase.

Proposed Operational Limitations (*if any*) NSPS Subpart IIII, minimum Tier 3

Source Classification Code (SCC)/ Description: 20200102

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): IIII
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): ZZZZ which applies 40 CFR 60 Subpart IIII
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel fuel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

### §4.3 Process Identification

Make TBD Model NSPS Subpart IIII, Tier 3 minimum

Type \_\_\_\_\_ Size up to 100-hp

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) 100

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) diesel

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 500 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Use of NSPS Subpart IIII engines.

Primary Air Pollution Control Equipment Description:

Make NSPS Subpart IIII - Tier 3 Minimum Engines Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

**§4.9 Shakedown Procedures (not required for Title V Operating Permit applications)**

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P9 Emitting Unit Name: 50-hp Diesel Fire Pump - Emergency

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The fire pump will provide power to pump water in the event of a fire, will be available in all phases.

Proposed Operational Limitations (*if any*) NSPS Subpart IIII, minimum Tier 3

Source Classification Code (SCC)/ Description: 20200102

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): IIII
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): ZZZZ which applies 40 CFR 60 Subpart IIII
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel fuel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

### §4.3 Process Identification

Make TBD Model NSPS Subpart IIII, Tier 3 minimum

Type \_\_\_\_\_ Size up to 50-hp

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) 50

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) diesel

**§4.5 Emitting Unit Location - Various, Portable Unit**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Downward Exit   | <input type="checkbox"/> Multiple Actual Stacks | <input type="checkbox"/> Fugitive Source |
| <input type="checkbox"/> Horizontal Exit | <input type="checkbox"/> Building Roof Vent     | <input type="checkbox"/> Process Vent    |
| <input type="checkbox"/> Vertical Exit   | <input type="checkbox"/> Vertical Exit with Cap |  |

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 500 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Use of NSPS Subpart IIII engines.

Primary Air Pollution Control Equipment Description:

Make NSPS Subpart IIII - Tier 3 Minimum Engines Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

**§4.9 Shakedown Procedures (not required for Title V Operating Permit applications)**

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P10A Emitting Unit Name: 23 MMBtu/hr Propane-fired Heater (Upper Copper Zone)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The upper copper zone heater provides heat to underground mining operations at the Upper Copper Zone intake vent during production phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30590005

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Propane

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make TBD      Model TBD

Type \_\_\_\_\_ Size up to 23 MMBtu/hr

Year of Manufacture/Reconstruction TBD      Year of Installation \_\_\_\_\_

Power Source N/A

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) Propane

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location: See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_ Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_ Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_ Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit       Multiple Actual Stacks       Fugitive Source
  - Horizontal Exit       Building Roof Vent       Process Vent
  - Vertical Exit       Vertical Exit with Cap



**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours/day Days/Week \_\_\_\_\_

Hours/Year 5088 hours (seasonal use October-April) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:

Good combustion practices

Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable***

**§4.10 Continuous Emission Monitoring System (CEMS) – Not Applicable**

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of the Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P10B Emitting Unit Name: 52 MMBtu/hr Propane-fired Heater (Lower Copper Zone)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The lower copper zone heater provides heat to underground mining operations at the Lower Copper Zone intake vent during production phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30590005

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Propane

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make TBD Model TBD

Type \_\_\_\_\_ Size up to 52 MMBtu/hr

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source N/A

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) Propane

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location: *See modeling information in Section 6 and Appendix E***

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information *(if applicable): See modeling information in Section 6 and Appendix E***

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours/day Days/Week \_\_\_\_\_

Hours/Year 5088 hours (seasonal use October-April) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Good Combustion Practices

Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable***

**§4.10 Continuous Emission Monitoring System (CEMS)** – *Not Applicable*

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of the Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P11 Emitting Unit Name: 3 Temporary Diesel Heaters at Portal (1.2 MMBtu/hr total)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The temporary diesel heaters will provide heat to development phase operations where necessary.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30590001

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make TBD      Model TBD

Type \_\_\_\_\_      Size up to 1.2 MMBtu/hr (total)

Year of Manufacture/Reconstruction TBD      Year of Installation \_\_\_\_\_

Power Source N/A

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) Diesel

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_      Sulfur Content (%) \_\_\_\_\_      Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location - Various, Portable Units**

Latitude (in decimal degrees): \_\_\_\_\_      Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_      Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_      Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_      Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Downward Exit   | <input type="checkbox"/> Multiple Actual Stacks | <input type="checkbox"/> Fugitive Source |
| <input type="checkbox"/> Horizontal Exit | <input type="checkbox"/> Building Roof Vent     | <input type="checkbox"/> Process Vent    |
| <input type="checkbox"/> Vertical Exit   | <input type="checkbox"/> Vertical Exit with Cap |  |

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:

N/A

Primary Air Pollution Control Equipment Description:

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable***

**§4.10 Continuous Emission Monitoring System (CEMS)** – *Not Applicable*

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of the Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P12 Emitting Unit Name: 3640 TPD Jaw Crusher/Building

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The jaw crusher process building will enclose the jaw crusher, conveyors and initial rock drop operations and is controlled by a dust collector. This operates during production phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30502001

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): LL
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Copper-enriched rock

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) 3640 TPD



**§4.3 Process Identification**

Make TBD      Model TBD

Type \_\_\_\_\_ Size up to 3640 TPD

Year of Manufacture/Reconstruction TBD      Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Downward Exit   | <input type="checkbox"/> Multiple Actual Stacks | <input type="checkbox"/> Fugitive Source |
| <input type="checkbox"/> Horizontal Exit | <input type="checkbox"/> Building Roof Vent     | <input type="checkbox"/> Process Vent    |
| <input type="checkbox"/> Vertical Exit   | <input type="checkbox"/> Vertical Exit with Cap |  |

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:

Controlled by a dust collector meeting a 0.01 gr/dscf BACT limitation

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Primary Air Pollution Control Equipment Description:

Make TBD Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 99+%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

Secondary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period:

**Not applicable**

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**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** *(not required for Title V Operating permit applications)*

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement *(check all that apply)*:       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** *(not required for Title V Operating Permit applications)*

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P13A Emitting Unit Name: Mill Building (mill, lime storage, etc.)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) This portion of the mill building contains the copper milling/flotation processes and lime storage during production phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30502005

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): LL
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Copper-enriched rock

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) 3640 TPD

**§4.3 Process Identification**

Make TBD Model TBD

Type \_\_\_\_\_ Size N/A

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_ Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_ Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_ Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:

Controlled by a dust collector meeting a 0.01 gr/dscf BACT limitation

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Primary Air Pollution Control Equipment Description:

Make TBD Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 99+%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

Secondary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period:

**Not applicable**

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**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

***See Section 5 of the Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P13B Emitting Unit Name: Mill Building (lime area, slurry mix tank, etc.)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) This portion of the mill building contains the lime processing area and slurry mix tank during production phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30502005

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): LL
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Copper-bearing material

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) 3640 TPD



**§4.3 Process Identification**

Make TBD Model TBD

Type \_\_\_\_\_ Size up to 3640 TPD

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_ Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_ Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_ Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:

Controlled by a dust collector meeting a 0.01 gr/dscf BACT limitation

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Primary Air Pollution Control Equipment Description:

Make TBD Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 99+%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

Secondary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period:

**Not applicable**

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**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P14 Emitting Unit Name: Surge Bin Discharge

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The surge bin would contain materials in preparation for further size reduction in the milling process during production phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30510298

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): LL
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Copper-bearing material

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) up to 2755 tons

**§4.3 Process Identification**

Make TBD Model TBD

Type \_\_\_\_\_ Size up to 2755 tons

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_ Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_ Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_ Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:

Controlled by a dust collector meeting a 0.01 gr/dscf BACT limitation

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Primary Air Pollution Control Equipment Description:

Make TBD Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 99+%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

Secondary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period:

**Not applicable**

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**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

***See Section 5 of the Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P15 Emitting Unit Name: Water Treatment Plant Lime Area

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The water treatment plant lime area contains lime for use in water treatment during production phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 2630010000

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Lime for water treatment

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) 500 gpm of water treated



**§4.3 Process Identification**

Make TBD Model TBD

Type \_\_\_\_\_ Size 500 gpm of water treated

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_ Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_ Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_ Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:

Controlled by a dust collector meeting a 0.01 gr/dscf BACT limitation

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Primary Air Pollution Control Equipment Description:

Make TBD Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 99+%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

Secondary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period:

**Not applicable**

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**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

***See Section 5 of the Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P16A Emitting Unit Name: Backfill Plant Cement/Fly Ash Hopper

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The backfill plant cement/fly ash hopper will store cement/fly ash during production phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30502001

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Cement/fly ash

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) 100 metric tons

**§4.3 Process Identification**

Make TBD Model TBD

Type \_\_\_\_\_ Size up to 100 metric tons

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_ Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_ Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_ Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:

Controlled by a dust collector meeting a 0.01 gr/dscf BACT limitation

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Primary Air Pollution Control Equipment Description:

Make TBD Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 99+%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

Secondary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period:

**Not applicable**

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**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P16B Emitting Unit Name: Backfill Plant Cement/Fly Ash Silo

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The backfill plant cement/fly ash silo will store cement/fly ash in production phase.

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30502001

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Cement/fly ash

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) 100 metric tons



**§4.3 Process Identification**

Make TBD Model TBD

Type \_\_\_\_\_ Size up to 100 metric tons

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location - See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_ Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_ Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_ Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:

Controlled by a dust collector meeting a 0.01 gr/dscf BACT limitation

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Primary Air Pollution Control Equipment Description:

Make TBD Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 99+%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

Secondary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period:

**Not applicable**

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**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P17 Emitting Unit Name: 4 Portable Diesel Eng/Generators (total 400-hp)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The generators will supply portable power as needed during during the development and production phases.

Proposed Operational Limitations (*if any*) NSPS Subpart IIII, minimum Tier 3

Source Classification Code (SCC)/ Description: 20200102

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): IIII
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): ZZZZ which applies 40 CFR 60 Subpart IIII
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel fuel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

### §4.3 Process Identification

Make TBD Model NSPS Subpart IIII, Tier 3 minimum

Type \_\_\_\_\_ Size up to 400-hp (total for 4 engines)

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) up to 400-hp (total for 4 engines)

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) diesel

**§4.5 Emitting Unit Location - Various, Portable Unit**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Downward Exit   | <input type="checkbox"/> Multiple Actual Stacks | <input type="checkbox"/> Fugitive Source |
| <input type="checkbox"/> Horizontal Exit | <input type="checkbox"/> Building Roof Vent     | <input type="checkbox"/> Process Vent    |
| <input type="checkbox"/> Vertical Exit   | <input type="checkbox"/> Vertical Exit with Cap |  |

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Use of NSPS Subpart IIII engines.

Primary Air Pollution Control Equipment Description:

Make NSPS Subpart IIII - Tier 3 Minimum Engines Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

**§4.9 Shakedown Procedures (not required for Title V Operating Permit applications)**

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: P18 Emitting Unit Name: 275-hp Portable Diesel Eng/Generator for Air Compressor

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The generator will supply power to the air compressor during the development phase (an electric compressor will replace it in production phase).

Proposed Operational Limitations (*if any*) NSPS Subpart IIII, minimum Tier 3

Source Classification Code (SCC)/ Description: 20200102

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): IIII
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): ZZZZ which applies 40 CFR 60 Subpart IIII
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel fuel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

### §4.3 Process Identification

Make TBD Model NSPS Subpart IIII, Tier 3 minimum

Type \_\_\_\_\_ Size up to 275-hp

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) 275

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) diesel

**§4.5 Emitting Unit Location - Various, Portable Unit**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Downward Exit   | <input type="checkbox"/> Multiple Actual Stacks | <input type="checkbox"/> Fugitive Source |
| <input type="checkbox"/> Horizontal Exit | <input type="checkbox"/> Building Roof Vent     | <input type="checkbox"/> Process Vent    |
| <input type="checkbox"/> Vertical Exit   | <input type="checkbox"/> Vertical Exit with Cap |  |

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 (permitted) Days/Week \_\_\_\_\_

Hours/Year 8760 (permitted) Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Use of NSPS Subpart IIII engines.

Primary Air Pollution Control Equipment Description:

Make NSPS Subpart IIII - Tier 3 Minimum Engine Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_



**§4.9 Shakedown Procedures** *(not required for Title V Operating Permit applications)*

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable***

**§4.10 Continuous Emission Monitoring System (CEMS) – Not applicable**

**§4.11 Emissions Control Analysis** *(not required for Title V Operating permit applications)*

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement *(check all that apply)*:       BACT                               LAER

***See Section 5 of the Application***

**§4.12 Stack Height and Dispersion Technique Analysis** *(not required for Title V Operating Permit applications)*

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: UG Emitting Unit Name: ANFO

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) ANFO will be used underground during both development phase and production phase (less ANFO planned for daily use in development phase, 2 blasts per day instead of 8.5).

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: **30102123**

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed ANFO, explosive

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) 8.5 blasts per day, 0.5 tons of ANFO per blast

**§4.3 Process Identification**

Make TBD Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location: Immediately SW of the staff parking lot in the mill area**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hr/day Days/Week \_\_\_\_\_

Hours/Year 8760 hr/yr Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Best Operating Practices.

Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period:

***Not applicable***

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of the Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F1 Emitting Unit Name: Road Dust, MOY 0 to 1

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Road dust generated from vehicles MOY 0 to 1, development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F2 Emitting Unit Name: Road Dust, MOY 1 to 2

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Road dust generated from vehicles MOY 1 to 2, development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_



**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F3 Emitting Unit Name: Road Dust, MOY 2 to 15, Annual Average

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Road dust generated from vehicles MOY 2 to 15, Annual Average, production phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F4 Emitting Unit Name: Road Dust, MOY 16 and 17, Annual Average

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Road dust generated from vehicles MOY 16 and 17, Annual Average, reclamation phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)



## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F5 Emitting Unit Name: Road Dust, MOY 18

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Road dust generated from vehicles MOY 18, reclamation phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F6 Emitting Unit Name: Material Transfer to Temporary Stockpile, MOY 0 to 1.5

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive emissions generated from transferring soil/material to the temporary stockpile during development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F7 Emitting Unit Name: Temporary Construction Stockpile

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust emissions from wind during development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.



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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F8 Emitting Unit Name: Embankment Construction, MOY 0 to 1.5

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust from construction of embankments from MOY 0 to 1.5, development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F9 Emitting Unit Name: Backfill, Non-contact Water Reservoir (NCWR) Embankment Material to Cemented Tailings Facility (CTF), MOY 16 to 18, reclamation phase.

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from backfill, NCWR Embankment Material to CTF, MOY 16 to 18 during reclamation.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F10 Emitting Unit Name: Material Transfer to South Stockpile, MOY 0 to 1

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from transferring soil/materials to south stockpile during development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_



**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F11 Emitting Unit Name: Excess Reclamation Stockpile (South)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from the south reclamation stockpile, will be used in all phases.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F12 Emitting Unit Name: Material Transfer from South Stockpile, MOY 16 to 17

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from material transfer from south stockpile during reclamation phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)



## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F13 Emitting Unit Name: Material Transfer to North Stockpile, MOY 0 to 1

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from material transfer to North Stockpile MOY 0 to 1, development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F14 Emitting Unit Name: Excess Reclamation Stockpile (North)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from wind off of the stockpile, will be used in all phases.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F15 Emitting Unit Name: Material Transfer from North Stockpile, MOY 16 to 18

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from material transfer to North Stockpile during mine reclamation phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.



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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F16 Emitting Unit Name: Soil Removal and Stockpiling, MOY 0 to 1

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from soil removal and stockpiling during the development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F17 Emitting Unit Name: Topsoil Pile

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from the topsoil pile, used in all phases.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F18 Emitting Unit Name: Subsoil Pile

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from the subsoil pile, used in all phases.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_



**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F19 Emitting Unit Name: Soil Return, MOY 16 to 18

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from during reclamation soil return (reclamation phase).

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F20 Emitting Unit Name: Copper-enriched Rock Drop to Stockpile, MOY 2 to 3

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust associated with copper-enriched rocks dropping into stockpile for further processing MOY 2 to 3, development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)



## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F21 Emitting Unit Name: Copper-enriched Rock Stockpile (Mill Feed)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust associated with wind on the copper-enriched rock stockpile during production phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F22 Emitting Unit Name: Waste Rock Drop at Waste Rock Storage (WRS) Pad, MOY 0 to 1.5, at CTF, MOY 1.5 to 4 and 8

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from handling of waste rock to storage, the time periods describe both development and production phases.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information** *(if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E*

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F23 Emitting Unit Name: Temporary WRS

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from temporary waste rock storage activities during development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.



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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F24 Emitting Unit Name: Waste Rock Transfer from WRS to CTF, MOY 2 to 3

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from waste rock transfer to CTF during development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F25 Emitting Unit Name: Waste Rock Storage Pad Reclamation, MOY 3

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Fugitive dust generated from waste rock storage pad reclamation during the end of development phase.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F26 Emitting Unit Name: 11 -14-hp Portable Diesel-fired Light Plants (154 hp total)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The light plants will supply portable light during the development phase (4 will remain during production phase).

Proposed Operational Limitations (*if any*) NSPS Subpart IIII, minimum Tier 3

Source Classification Code (SCC)/ Description: 20200102

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): IIII
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): ZZZZ which applies 40 CFR 60 Subpart IIII
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel fuel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

### §4.3 Process Identification

Make TBD Model NSPS Subpart IIII, Tier 3 minimum

Type \_\_\_\_\_ Size up to 154-hp (total)

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_



If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) up to 154-hp (total)

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) diesel

**§4.5 Emitting Unit Location - Various, Portable Units**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day<sub>24</sub> (permitted) \_\_\_\_\_ Days/Week \_\_\_\_\_

Hours/Year<sub>8760</sub> (permitted) \_\_\_\_\_ Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Use of NSPS Subpart IIII engines.

Primary Air Pollution Control Equipment Description:

Make NSPS Subpart IIII - Tier 3 Minimum Engines Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

**§4.9 Shakedown Procedures (not required for Title V Operating Permit applications)**

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: *Not applicable*

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining a MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):       BACT                               LAER

*See Section 5 of the Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F27 Emitting Unit Name: 500-gal Gasoline Storage Tank (double-walled)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The gasoline storage tank will provide on-site fuel storage during both development and production phases.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: **40400109**

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): Subpart CCCCCC
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Gasoline, stored

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) Est. 1000 gal/month

**§4.3 Process Identification**

Make TBD Model \_\_\_\_\_

Type \_\_\_\_\_ Size 500 gal

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location: Immediately SW of the staff parking lot in the mill area**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hr/day Days/Week \_\_\_\_\_

Hours/Year 8760 hr/yr Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Not applicable.

Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period:

***Not applicable***

**§4.10 Continuous Emission Monitoring System (CEMS) – *Not applicable***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of the Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F28 Emitting Unit Name: 9-Temporary Portable Propane-fired Heaters (37.8 MMBtu/hr total)

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) The portable heaters will provide heat on site during the development phase (3 heaters will remain during production phase).

Proposed Operational Limitations (*if any*) N/A

Source Classification Code (SCC)/ Description: 30590005

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Propane

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) 37.8 MMBtu/hr total

**§4.3 Process Identification**

Make TBD Model TBD

Type \_\_\_\_\_ Size up to 37.8 MMBtu/hr

Year of Manufacture/Reconstruction TBD Year of Installation \_\_\_\_\_

Power Source N/A

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) Propane

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location: See modeling information in Section 6 and Appendix E**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): See modeling information in Section 6 and Appendix E**

Height (feet) \_\_\_\_\_

Inside Diameter (feet) \_\_\_\_\_

Exit Gas Temperature (°F) \_\_\_\_\_

Exit Gas Flow Rate (ACFM) \_\_\_\_\_

Exit Gas Velocity (ft/sec) \_\_\_\_\_

Exit Gas Moisture Content (%) \_\_\_\_\_

- Stack Type (check one):
- Downward Exit
  - Horizontal Exit
  - Vertical Exit
  - Multiple Actual Stacks
  - Building Roof Vent
  - Vertical Exit with Cap
  - Fugitive Source
  - Process Vent

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours/day Days/Week \_\_\_\_\_

Hours/Year 8760 hours Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Good Combustion Practices

Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable***

**§4.10 Continuous Emission Monitoring System (CEMS)** – *Not Applicable*

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of the Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)



## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F29 Emitting Unit Name: Road Dust, Construction Access Road, MOY 0-2, Avg

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Road dust generated from vehicles on the construction access road, MOY 0-2, averaged (development phase).

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: F30 Emitting Unit Name: Road Dust, Main Access Road, MOY 2-15, Avg

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Road dust generated from vehicles on the main access road (employees, contractors, suppliers, etc.), MOY 2-15 (production phase), averaged.

Proposed Operational Limitations (*if any*) \_\_\_\_\_  
\_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Fugitive Particulate Matter

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

**§4.3 Process Identification**

Make \_\_\_\_\_ Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable – fugitive source, see modeling information in Section 6 and Appendix E**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Water suppression used as necessary along with Best Operating Practices.

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Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_

Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency 50%

Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: ***Not applicable.***

**§4.10 Continuous Emission Monitoring System (CEMS)** – ***Not applicable.***

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

***See Section 5 of Application***

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## §4.0 Emitting Unit and Control Equipment Information

A separate Section 4.0 must be completed for each emitting unit listed in Section 2.0. Applications for Title V Operating Permits must address significant emission units individually. Insignificant emission units may be addressed as a group. For information that has been previously submitted, the applicant may instead reference the previously submitted information, including the date the material was submitted and the source (i.e. permit application number, etc.)

Emitting Unit ID: IEU1 Emitting Unit Name: Diesel Storage Tanks (250-gal, 500-gal, 10,000-gal), in use for Development and Production Phases

### §4.1 Emitting Unit Overview:

Narrative Process Equipment/Process Description (*attach additional sheets as necessary*) Diesel storage tanks for support of vehicle/engines.

Proposed Operational Limitations (*if any*) \_\_\_\_\_

Source Classification Code (SCC)/ Description: 30301101

(Note: SCC Codes can be found at the following website:  
<http://cfpub.epa.gov/oarweb/download/WebFIRESCCs.csv>)

Regulatory Programs: Indicate all air pollution control programs applicable to this emitting unit:

- NSPS: 40 CFR 60, Subpart(s): \_\_\_\_\_
- NESHAPS: 40 CFR 61, Subpart(s): \_\_\_\_\_
- MACT: 40 CFR 63, Subpart(s): \_\_\_\_\_
- Title V Operating Permit – Significant Emitting Unit
- Acid Rain (Title IV)
- Risk Management Plan
- CAM Plan
- Other: \_\_\_\_\_

### §4.2 Process Information (*include units*):

Type of Material Processed Diesel

Average Process Rate (tons/hr, gal/hr, etc.) \_\_\_\_\_

Maximum Rated Design Process Rate (tons/hr, gal/hr, etc.) 250-gal, 500-gal, 10,000 gal

**§4.3 Process Identification**

Make TBD Model \_\_\_\_\_

Type \_\_\_\_\_ Size \_\_\_\_\_

Year of Manufacture/Reconstruction \_\_\_\_\_ Year of Installation \_\_\_\_\_

Power Source \_\_\_\_\_

If applicable, provide the following generator information:

Rated Output of the generator (kW) \_\_\_\_\_

Rated Size of Engine powering the generator (hp) \_\_\_\_\_

**§4.4 Fuel/Combustion Information:**

*(For variable parameters, indicate the maximum value or a range)*

Fuel Type(s) \_\_\_\_\_

Average Fuel Combustion Rate: \_\_\_\_\_

Maximum Rated Combustion Rate: \_\_\_\_\_

Heat Content (Btu rating) \_\_\_\_\_ Sulfur Content (%) \_\_\_\_\_ Ash Content (%) \_\_\_\_\_

**§4.5 Emitting Unit Location Various on mine site**

Latitude (in decimal degrees): \_\_\_\_\_ Longitude (in decimal degrees): \_\_\_\_\_

Datum (NAD27, NAD83, etc.): \_\_\_\_\_

**§4.6 Stack Information (if applicable): Not applicable –**

**§4.7 Approximate Operating Schedule:**

Hours/Day 24 hours Days/Week \_\_\_\_\_

Hours/Year 8760 hours/year Weeks/Year \_\_\_\_\_

**§4.8 Air Pollution Control Equipment and Practices**

Primary and Secondary Air Pollution Control Equipment and/or Procedure Description:  
Emissions are negligible from diesel storage.



Primary Air Pollution Control Equipment Description:

Make N/A Model \_\_\_\_\_  
Type \_\_\_\_\_ Size \_\_\_\_\_  
Year of Manufacture \_\_\_\_\_ Year of Installation \_\_\_\_\_  
Fuel Type(s) \_\_\_\_\_ Estimated Control Efficiency \_\_\_\_\_  
Estimated Capital Equipment Cost (*not required for Title V Operating Permit applications*) \_\_\_\_\_

**§4.9 Shakedown Procedures** (*not required for Title V Operating Permit applications*)

Describe any shakedown procedures that are expected to affect emissions, including the duration of the shakedown period: **Not applicable.**

**§4.10 Continuous Emission Monitoring System (CEMS) – Not applicable.**

**§4.11 Emissions Control Analysis** (*not required for Title V Operating permit applications*)

Best Available Control Technology (BACT) is required for all sources obtaining an MAQP. The BACT analysis should be conducted separately for each pollutant emitted from each emitting unit. Control costs (cost per ton of air pollutant controlled) should be calculated for each option. Options may then be eliminated for economic, energy or environmental reasons. The control option that is selected should have controls or control costs similar to other recently permitted similar sources and should be capable of achieving appropriate emission standards. If necessary, a separate start-up/shut-down BACT analyses should be conducted.

Lowest Achievable Emission Rate (LAER) is required for major stationary sources and major modifications located in a nonattainment area. LAER is also required for major stationary sources or major modifications located in an area designated as attainment or unclassified under 40 CFR 81.327, but would cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in a nearby nonattainment area. The LAER analysis shall demonstrate that the emission rate proposed is equivalent to the most stringent emission rate achievable or contained in any state implementation plan for a similar source.

**Attach BACT/LAER Analysis Results, as applicable.**

Applicable Requirement (*check all that apply*):  BACT  LAER

*See Section 5 of Application*

**§4.12 Stack Height and Dispersion Technique Analysis** (*not required for Title V Operating Permit applications*)

If applicable, supply a stack height and dispersion technique analysis demonstrating compliance with the requirements of the Stack Heights and Dispersion Technique Rule (ARM 17.8, Subchapter 4)

## § 5.0 Project and Site Information

*Note: This section is not required to be completed for Title V Operating Permit applications.*

**These questions will be answered in the Environmental Impact Statement (EIS) being prepared for the Tintina Black Butte Copper Project in conjunction with the Mine Operating Permit process.**

Identify the landowner of the proposed project site and the current land use (industrial, agricultural, residential, etc.):

Please refer to the Mine Operating Permit Application and Environmental Impact Statement (EIS) being developed for the Tintina Black Butte Copper Project.

Indicate the approximate distance to the nearest home and/or structure not associated with the proposed project site:

Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Summarize the aesthetic character of the proposed project site and the surrounding community or neighborhood. Include a description of recreational opportunities and any unique cultures in the area that may be affected by the proposed project:

Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Describe the noise levels created by the proposed project:

Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Summarize other industrial activities at or near the site:

Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

List other permits and/or approvals which have been obtained or will be obtained for this project (including MPDES permits, open cut permit, hazardous waste permit, etc.):

Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Indicate the number of employees currently employed and the increase or decrease in the number of people employed at this site as a result of the proposed project:

Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Describe any upgrades of utilities that may be necessary to meet the power demands for this proposed project:

Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Identify the amount of land that will be disturbed, in acres, as a result of this proposed project:

Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Identify any fish or wildlife habitat, animal or bird species, or any known migration or movement of animals at the project site: Identify any plant species (including types of trees, shrubs, grasses, crops, and aquatic plants) at the proposed project site:

Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Describe any proposed discharges into surface water or onto the proposed project site:  
Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Identify any potential impacts to wetlands and/or changes in the drainage patterns at the proposed project site:  
Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Summarize the soils and geology of the project site. Include a description of any disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil that would reduce the productivity or fertility of the soil at the site:  
Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Summarize any access to recreational activities or wilderness areas near the proposed project site:  
Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

Describe any state, county, city, United States Forest Service (USFS), Bureau of Land Management (BLM), or tribal zoning or management plans and/or goals that might affect the site:  
Please refer to the Mine Operating Permit Application and EIS being developed for the Tintina Black Butte Copper Project.

## § 6.0 Instructions on Public Notice For Montana Air Quality Permit

*Note: This section is not required to be completed for Title V Operating Permit applications.*

The applicant shall publish the following notification no earlier than 10 days prior to the date the applicant's MAQP application will be submitted to the Department, and no later than 10 days following the date of submittal. The notice shall be published **once** in the legal notice section of a newspaper of general circulation in the area affected. (*Note: MAQP applications for solid waste incinerators, subject to 75-10-221, Montana Code Annotated (MCA), or hazardous waste incinerators or boilers or industrial furnaces, subject to 75-10-406, MCA, must publish **three** public notices, each on separate days, in the legal notice section of a newspaper in the county in which the source is proposed be located.*) Any fees associated with publication of this notice are the responsibility of the permit applicant. Questions regarding an appropriate newspaper should be addressed to the Department.

An Affidavit of Publication of Public Notice must be submitted with the application or the permit application will be deemed incomplete. This notice is required by the air quality rules. **The notice to be published must contain all text, excluding the text in italics, within the box below.**

### Public Notice

Notice of Application for a Montana Air Quality Permit (MAQP), pursuant to Sections 75-2-211 and 75-2-215, MCA, and the Air Quality Rules. Tintina Montana Inc., will file on or about February 20, 2018, an application for an MAQP from the Montana Department of Environmental Quality. Applicant(s) seeks approval of its application for:

The development and operation of a new underground copper mine and mill at the Black Butte Copper Project site, located 15 miles north of White Sulphur Springs. The project will produce and ship copper concentrate mined from both the upper and lower zones of the Johnny Lee copper deposit.

The legal description of the site is: Sections 24, 25, and 36 Township 12 North, Range 6 East and Sections 19, 29, 30, 31, and 32 in Township 12 North, Range 7 East, in Meagher, County, Montana.

Within 40 days of the receipt of a completed application, the Department will make a preliminary determination whether the permit should be issued, issued with conditions, or denied. Any member of the public with questions or who wishes to receive notice of the preliminary determination, and the location where a copy of the application and the Department's analysis of it can be reviewed, or to submit comments on the preliminary determination, must contact the Department at Department of Environmental Quality, Air Quality Bureau, Air Permitting Services Section Supervisor at P.O. Box 200901, Helena, MT 59620-0901, telephone (406) 444-3490. Any comments on the preliminary determination must be submitted to the Department within the specified timeframe (within 30 days after the preliminary determination is issued).

## § 7.0 Applicable Requirements

### §7.1 Applicable Requirements

**Attach a complete listing and description of all applicable air pollution control requirements**, including rules and regulations which have been promulgated at the time of the submittal of the application, but which will become effective at a later date. Explain any proposed exemptions from otherwise applicable requirements. Describe or reference any applicable test methods for determining compliance with each applicable requirement.

### §7.2 Additional Requirements

Additional requirements may apply. A description of the requirements listed below is included in the Section 7.2 Supplement included on page 18 of this application. **Note which of the following requirements apply to this permit application** (*check each that applies*):

- Ambient Air Quality Impact Analysis
- Alternative Siting Analysis
- Alternative Operating Scenario
- Compliance Schedule/Plan
- Compliance Certification
- Additional Requirements for solid or hazardous waste incinerators or BIFS subject to 75-10-406, MCA
- Additional Requirements for Commercial Medical and Commercial Hazardous Waste Incinerators, including BIFS Subject to 75-10-406, MCA

## § 8.0 Certification of Truth, Accuracy, and Completeness

**I hereby certify that, to the best of my knowledge, information and belief, formed after reasonable inquiry, the information provided in this permit application is true, accurate, and complete.**

*(Name, title and signature of corporate officer, responsible official, authorized representative, or designated representative under Title IV 1990 FCAA.)*

Name John Shanahan

Title President & CEO Phone 406-547-3466 Email: [jshanahan@tintinaresources.com](mailto:jshanahan@tintinaresources.com)

Signature \_\_\_\_\_

(Original Signature Required)

Date \_\_\_\_\_

February 20 2018

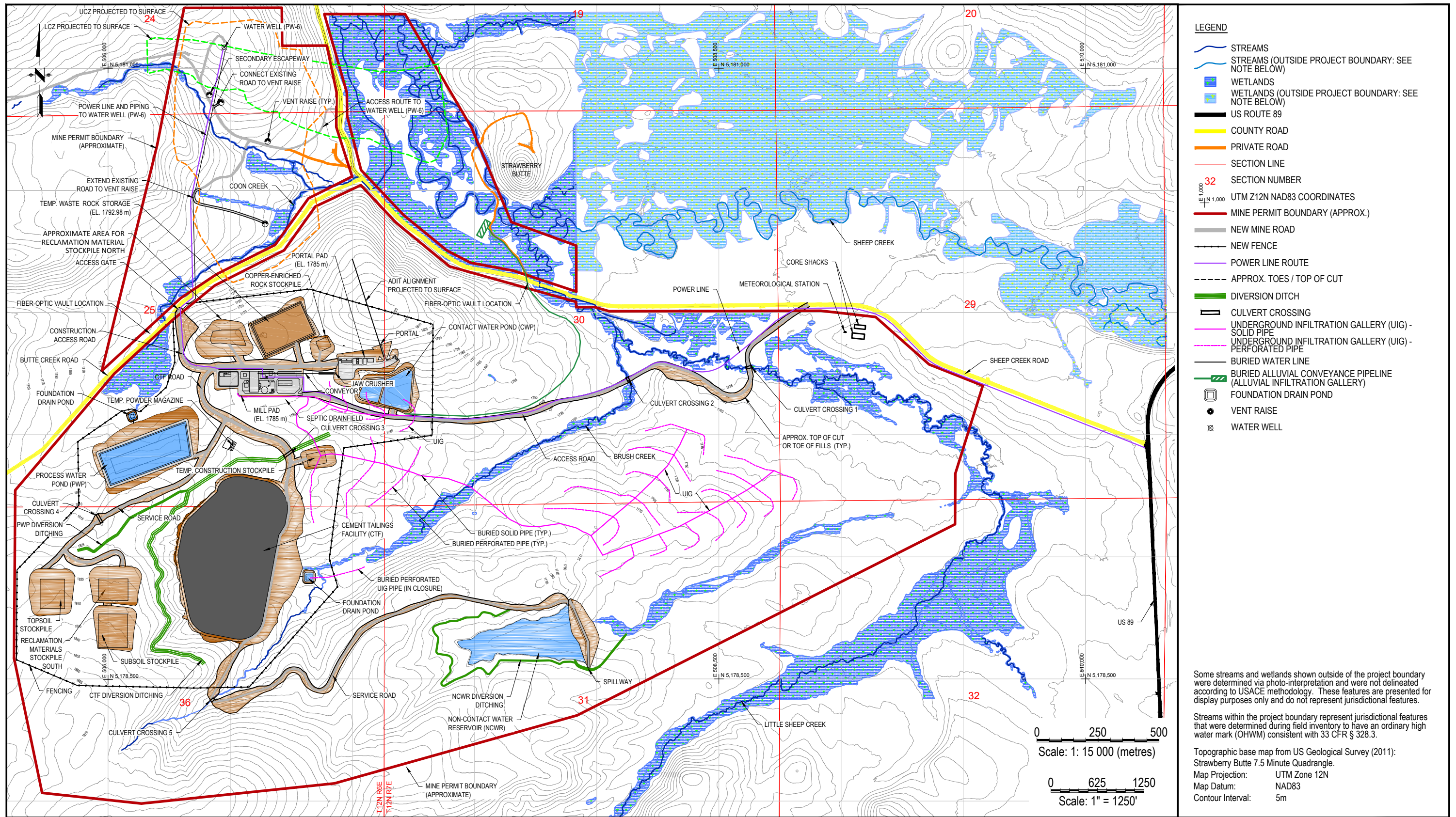
## APPLICATION CHECKLIST

The information contained in the checklist below must be submitted in order for the application to be considered complete. Additional information may be required by the Department. Please contact the Department if there are any questions or if the applicant would like a pre-application meeting with Department personnel.

- Completed Application Form
- Application Fee
- Site Map (Not required for Title V Operating Permit applications)
- Process Flow Diagrams (Not required for Title V Operating Permit applications)  
*Maps, not process flow diagrams, are included with this application.*
- Emission Inventory Calculations
- BACT/LAER Analysis (Not required for Title V Operating Permit applications)
- Stack Height and Dispersion Techniques Analysis (if applicable, not required for Title V Operating Permit applications)
- NA Modeling/Risk Assessment Analysis (if applicable, not required for Title V Operating Permit applications) – ***Modeling is included under Dispersion Techniques, no Risk Assessment is Required***
- List of Applicable Requirements
- Affidavit of Public Notice to be submitted when available (Not required for Title V Operating permit applications)
- Certification of Truth, Accuracy, and Completeness – Original Signature (if application form is submitted electronically)

**APPENDIX B: FACILITIES SITE PLAN, MILL DIAGRAM,  
AND UNDERGROUND WORKINGS/MINE VENT LOCATIONS**

Figure 1 - BBCP Facilities Site Plan



Some streams and wetlands shown outside of the project boundary were determined via photo-interpretation and were not delineated according to USACE methodology. These features are presented for display purposes only and do not represent jurisdictional features.

Streams within the project boundary represent jurisdictional features that were determined during field inventory to have an ordinary high water mark (OHWM) consistent with 33 CFR § 328.3.

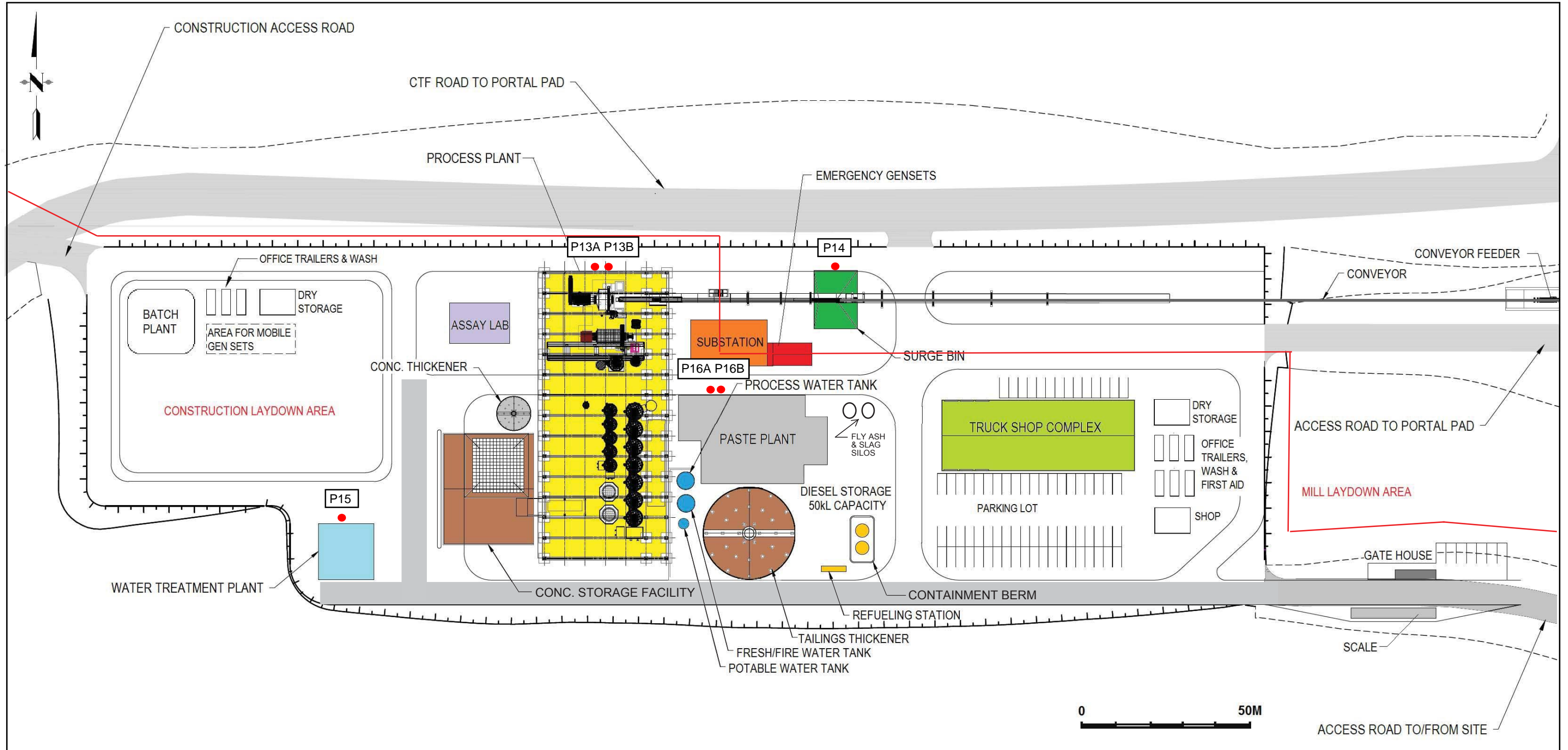
Topographic base map from US Geological Survey (2011):  
Strawberry Butte 7.5 Minute Quadrangle.  
Map Projection: UTM Zone 12N  
Map Datum: NAD83  
Contour Interval: 5m

Prepared by Tetra Tech Inc. (Revised July 2017)

**Facilities Site Plan**  
**Black Butte Copper Project**  
**Mine Operating Permit Application**  
Meagher County, Montana



Figure 2 - Mill Site Diagram

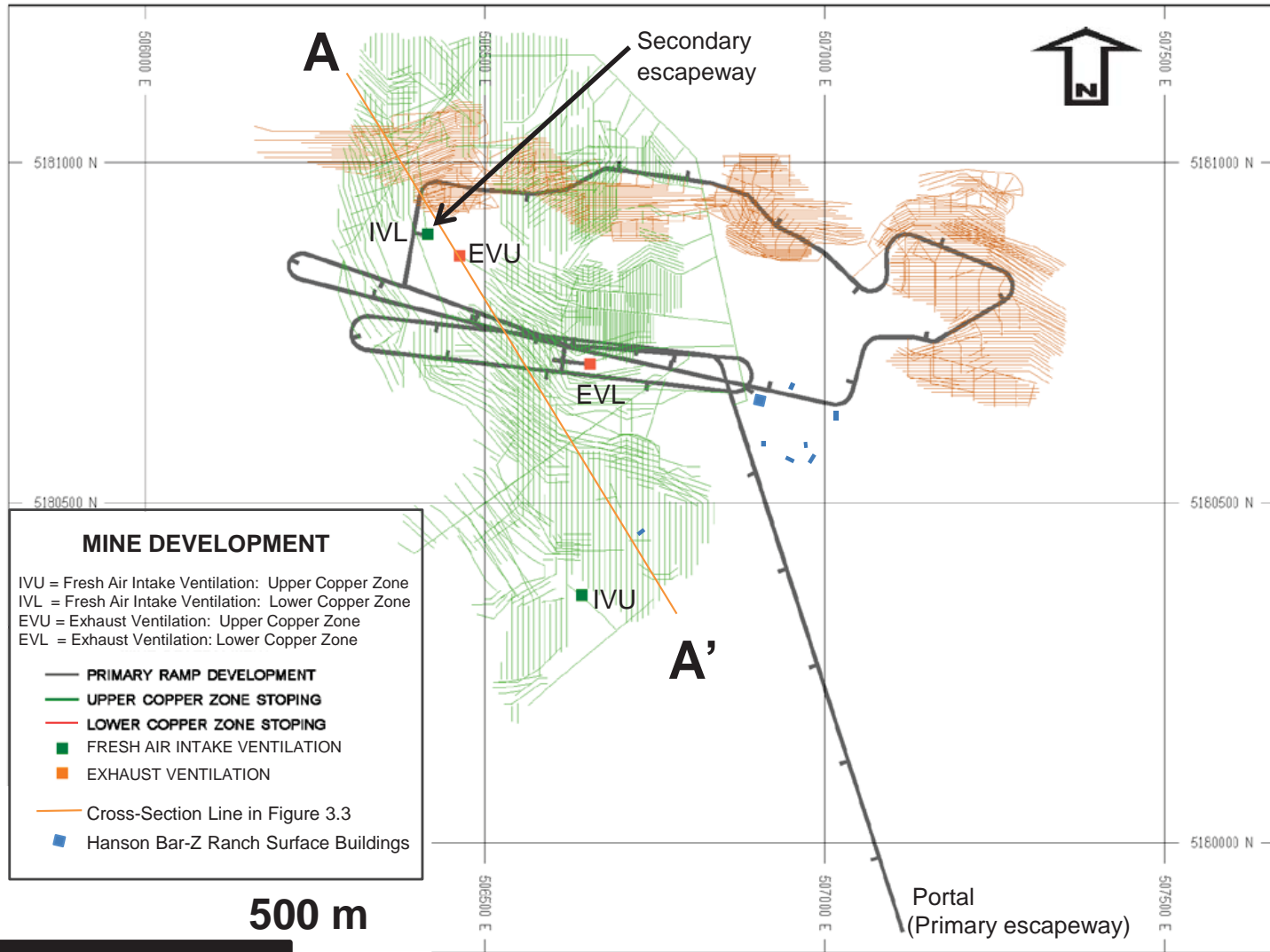


Prepared by Tetra Tech Inc. 2016

- Proposed Powerline
- CONC. = Concentrate
- P15 Baghouse Stack Locations

**Plan Map Showing Mill Facilities**  
**Black Butte Copper Project**  
 Meagher County, Montana

Figure 3 - Underground Workings/Vent Locations



Prepared by AMEC FW and Tintina

## **APPENDIX C: EMISSIONS INVENTORY**

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(Example Wind Data for Piles follows the individual emitting unit forms for point, underground, and fugitive sources)

**Black Butte Copper Project - Tintina Montana Inc.**  
**Underground copper mine and milling facility**  
**White Sulphur Springs, Montana**

**Potential Emissions Summary - Criteria Pollutants (Controlled)**

Point #	Emitting Unit	PM tons per year	PM <sub>10</sub> tons per year	PM <sub>2.5</sub> tons per year	SO <sub>2</sub> tons per year	NO <sub>x</sub> tons per year	CO tons per year	VOC tons per year
<b>POINT SOURCES</b>								
P1	250 TPH Portable Conical Crusher	1.31	0.59	0.11	--	--	--	--
P2	325-hp Portable Diesel Engine/generator	0.47	0.47	0.47	0.17	9.36	8.19	3.52
P3	2 Portable Screens (400 TPH each)	7.71	2.59	0.18	--	--	--	--
P4	131-hp Portable Diesel Engine/generator	0.28	0.28	0.28	0.07	3.77	4.72	1.42
P5	545-kW /914-hp Diesel Engine/generator	1.32	1.32	1.32	0.49	42.10	23.02	9.88
P6	320-kW /536-hp Diesel Engine/generator	0.77	0.77	0.77	0.03	15.45	13.52	5.80
P7	1000-kW /1675-hp Diesel Engine/generators (2) - Emergency	0.28	0.28	0.28	0.10	8.81	4.82	2.07
P8	100-hp Diesel Engine/generator - Emergency evac hoists	0.02	0.02	0.02	0.00	0.19	0.21	0.06
P9	50-hp Diesel Fire Pump - Emergency	0.01	0.01	0.01	0.00	0.10	0.10	0.03
P10A	23 MMBtu/hr Propane-fired heater @ Intake Vent for Upper Copper Zone	0.45	0.45	0.45	0.03	8.33	4.80	0.64
P10B	52 MMBtu/hr Propane-fired heater @ Intake Vent for Lower Copper Zone	1.01	1.01	1.01	0.08	18.83	10.86	1.45
P11	3 Temporary diesel heaters at Portal - (1.2 MMBtu/hr total)	0.05	0.05	0.05	0.08	0.75	0.19	0.02
P12	Jaw Crusher (3640 TPD), Building/Dust Collector	3.19	3.19	3.19	--	--	--	--
P13A	Mill Building (mill, lime storage, etc.) Dust Collector	0.19	0.19	0.19	--	--	--	--
P13B	Mill Building (lime area/slurry mix tank) Dust Collector	1.24	1.24	1.24	--	--	--	--
P14	Surge Bin Discharge Dust Collector	1.88	1.88	1.88	--	--	--	--
P15	Water Trtmt Plant Lime Area Dust Collector	1.24	1.24	1.24	--	--	--	--
P16A	Backfill Plant Cement/Fly Ash Hopper Dust Filter/Collector	0.23	0.23	0.23	--	--	--	--
P16B	Backfill Plant Cement/Fly Ash Silo Dust Filter/Collector	0.45	0.45	0.45	--	--	--	--
P17	Portable diesel engine/generators (total of 400 hp, 4 units)	1.15	1.15	1.15	0.21	13.54	14.40	4.33
P18	Air Compressor - Diesel Engine (275 hp)	0.40	0.40	0.40	0.15	7.92	6.93	2.98
F26	Diesel-powered Light plants - 11 - 14 hp each	1.48	1.48	1.48	0.008	20.91	4.51	1.67
F27	Gasoline storage tank (double-walled 500 gal)							0.07
F28	Temporary portable propane heaters (37.8 MMBtu/hr total) - 9	1.27	1.27	1.27	0.10	23.57	13.60	1.81
UG	ANFO	0.11	0.06	0.00	1.55	13.19	51.97	--
<b>TOTAL POINT SOURCES</b>		<b>26.49</b>	<b>20.60</b>	<b>17.65</b>	<b>3.07</b>	<b>186.82</b>	<b>161.83</b>	<b>35.74</b>

		Controlled PTE			SO2	NOx	CO	VOC	HAPs
		PM tons per year	PM <sub>10</sub> tons per year	PM <sub>2.5</sub> tons per year	tons per year	tons per year	tons per year	tons per year	tons per year
<b>FUGITIVE SOURCES (not included in Title V applicability)</b>									
F1	Road Dust, Mine Operating Year 0 to 1	152.70	38.92	3.90					
F2	Road Dust, Mine Operating Year 1 to 2	56.42	14.38	1.44					
F3	Road Dust, Mine Operating Year 2 to 15, annual average	17.79	4.53	0.45					
F4	Road Dust, Mine Operating Years 16 and 17, annual average	73.80	18.81	1.88					
F5	Road Dust, Mine Operating Year 18	11.68	2.98	0.30					
F6	Material transfer to Temporary Stockpile, MOY 0 to 1.5	3.13	0.91	0.30					
F7	Temporary construction stockpile (Table 3-13, 3.4.1)	0.002	0.001	0.000					
F8	Embankment Construction, Mine Operating Year 0 to 1.5	3.13	0.91	0.30					
F9	Backfill, NWCR Embankment Material to CTF, MOY 16 to 18	1.78	0.52	0.17					
F10	Material transfer to South Stockpile, MOY 0 to 1	1.49	0.43	0.14					
F11	Excess reclamation stockpile (South) (Table 3-13, 3.4.1)	0.002	0.001	0.000					
F12	Material transfer from South Stockpile, MOY 16 to 17	1.49	0.43	0.14					
F13	Material transfer to North Stockpile, MOY 0 to 1	2.13	0.62	0.20					
F14	Excess reclamation stockpile (North) (Table 3-13, 3.4.1)	0.002	0.001	0.000					
F15	Material transfer from North Stockpile, MOY 16 to 18	0.82	0.24	0.08					
F16	Soil Removal and Stockpiling, Mine Operating Year 0 to 1	4.99	1.45	0.47					
F17	Topsoil pile (Table 3-13, 3.4.1, 3.6.10)	0.002	0.001	0.000					
F18	Subsoil pile (Table 3-13, 3.4.1, 3.6.10)	0.002	0.001	0.000					
F19	Soil Return, Mine Operating Year 16 to 18	4.17	1.21	0.39					
F20	Copper-enriched rock drop to stockpile, MOY 2 to 3	0.16	0.06	0.06					
F21	Copper-enriched rock stockpile (mill feed) (Tables 3-5 & 3-13, 3.4.1)	0.003	0.002	0.000					
F22	Waste Rock Drop -at WRS Pad, MOY 0 to 1.5, at CTF, MOY 1.5 to 4 and 8	0.87	0.35	0.35					
F23	Temporary waste rock storage (WRS) (Table 3-5, 3-13, 3.4.1)	0.001	0.000	0.000					
F24	Waste Rock Transfer from WRS to CTF, MOY 2 to 3	1.39	0.56	0.56					
F25	Waste Rock Storage Pad Reclamation, MOY 3	1.65	0.48	0.16					
F29	Road Dust, Construction Access Road, Year 0 - 2 Avg.	0.90	0.23	0.02					
F30	Road Dust, Main Access Road, Year 2 - 15 Avg.	102.19	26.05	2.61					
<b>TOTAL FUGITIVE SOURCES</b>		<b>271.33</b>	<b>69.92</b>	<b>8.54</b>					
("Total" represents the worst case annual emissions from each category of source, e.g. F1: Road Dust, MOY 0 to 1 and F30: Road Dust - Main Access Road, MOY 2-15, etc.)									

**P1**

**Air Emissions Calculations**

**Tintina Montana Inc. Black Butte Copper Project**

**250-TPH Conical Crusher**

Maximum Process Rate = 250 TPH  
Hours of Operation = 8,760 hr/yr  
Conversions: 2000 lbs/ton

<b>Pollutant</b>	<b>Emission Factor</b>	<b>Units</b>	<b>Emission Factor Reference</b>	<b>Emissions (lbs/hr)</b>	<b>Emissions (tons/yr)</b>
PM	0.0012	lb/ton	AP-42 Table 11.19.2-2 (08/04) - Crushing	0.300	1.31
PM <sub>10</sub>	0.00054	lb/ton	AP-42 Table 11.19.2-2 (08/04) - Crushing	0.135	0.59
PM <sub>2.5</sub>	0.0001	lb/ton	AP-42 Table 11.19.2-2 (08/04) - Crushing	0.025	0.11

**Sample Calculation:**

PM Emissions = (Emission Factor, lb/ton) / (maximum process rate, tons/hr) = lb/hr  
PM Emissions (lb/hr) = (0.0012 lb/ton)\*(250 tons/hr) = 0.3 lb/hr  
PM Emissions = (Emissions, lb/hr)\*(8760 hr/yr)/(2000 lb/ton)  
Emissions (tons/yr) = (0.3 lbs/hr) x (8760 hrs/yr) / (2000 lbs/ton) = 1.314 tons/yr

**325-hp portable diesel-fired engine/generator**

Process Information		
Process Rate:	8,760	hr/yr
Engine power output:	325	hp
Sulfur Content	0.015	percent

Non-Criteria Pollutant Emission Limits	
opacity	<20%

**Tier 3 Engine - 40 CFR 89.112**

Power Rating range: 225< kW < 450

**Emission Standards**

Non-methane hydrocarbon + NOx:	4.0 g/kW-hr	6.58E-03 lb/hp-hr
CO:	3.5 g/kW-hr	5.75E-03 lb/hp-hr
PM:	0.20 g/kW-hr	3.29E-04 lb/hp-hr

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions		
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)
PM	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.11	2.56	0.47	20% opacity	0.11	2.56	0.47
PM <sub>10</sub>	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.11	2.56	0.47	20% opacity	0.11	2.56	0.47
PM <sub>2.5</sub>	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.11	2.56	0.47	20% opacity	0.11	2.56	0.47
Sulfur Dioxide (SO <sub>2</sub> )	1.21E-04	lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel and All Stationary Dual-Fuel Engines	0.04	0.95	0.17	not applicable	0.04	0.95	0.17
Nitrogen Oxides (NO <sub>x</sub> )	6.58E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1 assumes NMHC+NOx is all NOx	2.14	51.29	9.36	not applicable	2.14	51.29	9.36
Carbon Monoxide (CO)	5.75E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1	1.87	44.88	8.19	not applicable	1.87	44.88	8.19
VOC*	2.47E-03	lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines	0.80	19.27	3.52	not applicable	0.80	19.27	3.52

\*NOTE: Emission factor for VOC is assumed to be equal to the emission factor for Total Organic Carbon (TOC) in the exhaust. This would be a conservative estimate as not all TOC is VOC.

P3

Air Emissions Calculations

Tintina Montana Inc. Black Butte Copper Project

Two 400-TPH Screens

Maximum Process Rate = 800 TPH (total)  
Hours of Operation = 8,760 hr/yr  
Conversions: 2000 lbs/ton

Pollutant	Emission Factor	Units	Emission Factor Reference	Emissions (lbs/hr)	Emissions (tons/yr)
PM	0.0022	lb/ton	AP-42 Table 11.19.2-2 (08/04) - Controlled Screening	1.760	7.71
PM <sub>10</sub>	0.00074	lb/ton	AP-42 Table 11.19.2-2 (08/04) - Controlled Screening	0.592	2.59
PM <sub>2.5</sub>	0.00005	lb/ton	AP-42 Table 11.19.2-2 (08/04) - Controlled Screening	0.040	0.18

Sample Calculation:

PM Emissions = (Emission Factor, lb/ton) / (maximum process rate, tons/hr) = lb/hr  
PM Emissions (lb/hr) = (0.0022 lb/ton)\*(800 tons/hr) = 1.76 lb/hr  
PM Emissions = (Emissions, lb/hr)\*(8760 hr/yr)/(2000 lb/ton)  
PM Emissions (tons/yr) = (1.76 lbs/hr) x (8760 hrs/yr) / (2000 lbs/ton) = 7.709 tons/yr



131-hp portable engine/generator

Process Information		
Process Rate:	8,760	hr/yr
Engine power output:	131	hp
Sulfur Content	0.015	percent

Non-Criteria Pollutant Emission Limits	
opacity	<20%

**Tier 3 Engine - 40 CFR 89.112**

Power Rating range: 75< kW < 130

**Emission Standards**

Non-methane hydrocarbon + NOx:	4.0 g/kW-hr	6.58E-03 lb/hp-hr
CO:	5 g/kW-hr	8.22E-03 lb/hp-hr
PM:	0.30 g/kW-hr	4.93E-04 lb/hp-hr

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions		
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)
PM	4.93E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.06	1.55	0.28	20% opacity	0.06	1.55	0.28
PM <sub>10</sub>	4.93E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.06	1.55	0.28	20% opacity	0.06	1.55	0.28
PM <sub>2.5</sub>	4.93E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.06	1.55	0.28	20% opacity	0.06	1.55	0.28
Sulfur Dioxide (SO <sub>2</sub> )	1.21E-04	lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel and All Stationary Dual-Fuel Engines	0.02	0.38	0.07	not applicable	0.02	0.38	0.07
Nitrogen Oxides (NO <sub>x</sub> )	6.58E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1 assumes NMHC+NOx is all NOx	0.86	20.67	3.77	not applicable	0.86	20.67	3.77
Carbon Monoxide (CO)	8.22E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1	1.08	25.84	4.72	not applicable	1.08	25.84	4.72
VOC*	2.47E-03	lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines	0.32	7.77	1.42	not applicable	0.32	7.77	1.42

\*NOTE: Emission factor for VOC is assumed to be equal to the emission factor for Total Organic Carbon (TOC) in the exhaust. This would be a conservative estimate as not all TOC is VOC.

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**Air Emissions Calculations**

Tintina Montana Inc. Black Butte Copper Project

**545 kW diesel generator - D-Phase**

Process Information	
Process Rate:	8,760 hr/yr
Engine power output:	914 hp - ESTIMATE
Sulfur Content	0.015 percent

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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**Tier 2 Engine - 40 CFR 89.112 (no Tier 3 for engines of this size; Tier 2 for this size engine has the same date range as Tier 3)**

Power Rating range: kW > 560 (hp > 751.0)

**Emission Standards**

Non-methane hydrocarbon + NOx:	6.4 g/kW-hr	1.05E-02 lb/hp-hr
CO:	3.5 g/kW-hr	5.75E-03 lb/hp-hr
PM:	0.20 g/kW-hr	3.29E-04 lb/hp-hr

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions		
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)
PM	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.30	7.21	1.32	20% opacity	0.30	7.21	1.32
PM <sub>10</sub>	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.30	7.21	1.32	20% opacity	0.30	7.21	1.32
PM <sub>2.5</sub>	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.30	7.21	1.32	20% opacity	0.30	7.21	1.32
Sulfur Dioxide (SO <sub>2</sub> )	1.21E-04	lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel and All Stationary Dual-Fuel Engines	0.11	2.66	0.49	not applicable	0.11	2.66	0.49
Nitrogen Oxides (NO <sub>x</sub> )	1.05E-02	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1 - assumes NMHC+NOx is all NOx	9.61	230.69	42.10	not applicable	9.61	230.69	42.10
Carbon Monoxide (CO)	5.75E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1	5.26	126.16	23.02	not applicable	5.26	126.16	23.02
VOC*	2.47E-03	lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines	2.26	54.16	9.88	not applicable	2.26	54.16	9.88

\*NOTE: Emission factor for VOC is assumed to be equal to the emission factor for Total Organic Carbon (TOC) in the exhaust. This would be a conservative estimate as not all TOC is VOC.

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**Air Emissions Calculations**

Tintina Montana Inc. Black Butte Copper Project

**320 kW diesel generator - D-Phase**

Process Information	
Process Rate:	8760 hr/yr
Engine power output:	536 hp - ESTIMATE
Sulfur Content	0.015 percent

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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**Tier 3 Engine - 40 CFR 89.112**

Power Rating range: 225 < kW < 450 (301.7 < hp < 603.5)

**Emission Standards**

Non-methane hydrocarbon + NOx:	4.0 g/kW-hr	6.58E-03 lb/hp-hr
CO:	3.5 g/kW-hr	5.75E-03 lb/hp-hr
PM:	0.20 g/kW-hr	3.29E-04 lb/hp-hr

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions		
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)
PM	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.18	4.23	0.77	20% opacity	0.18	4.23	0.77
PM <sub>10</sub>	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.18	4.23	0.77	20% opacity	0.18	4.23	0.77
PM <sub>2.5</sub>	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.18	4.23	0.77	20% opacity	0.18	4.23	0.77
Sulfur Dioxide (SO <sub>2</sub> )	1.21E-05	lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel Industrial Engines	0.01	0.16	0.03	not applicable	0.01	0.16	0.03
Nitrogen Oxides (NO <sub>x</sub> )	6.58E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1 - assumes NMHC+NOx is all NOx	3.53	84.66	15.45	not applicable	3.53	84.66	15.45
Carbon Monoxide (CO)	5.75E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1	3.09	74.08	13.52	not applicable	3.09	74.08	13.52
VOC*	2.47E-03	lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines	1.32	31.80	5.80	not applicable	1.32	31.80	5.80

\*NOTE: Emission factor for VOC is assumed to be equal to the emission factor for Total Organic Carbon (TOC) in the exhaust. This would be a conservative estimate as not all TOC is VOC.

P7  
**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**1000-KW (1675-hp) emergency generator - 2**

Process Information	
Process Rate:	500 hr/yr
Engine power output:	3350 hp - ESTIMATE
Sulfur Content	0.015 percent

TOTAL for 2

Non-Criteria Pollutant Emission Limits	
opacity	<20%

**Tier 2 Engine - 40 CFR 89.112 (no Tier 3 for engines of this size; Tier 2 for this size engine has the same date range as Tier 3)**  
 Power Rating range: kW > 560 (hp > 751.0)

**Emission Standards**

Non-methane hydrocarbon + NOx:	6.4 g/kW-hr	1.05E-02 lb/hp-hr
CO:	3.5 g/kW-hr	5.75E-03 lb/hp-hr
PM:	0.20 g/kW-hr	3.29E-04 lb/hp-hr

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions		
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)
PM	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	1.10	26.44	0.28	20% opacity	1.10	26.44	0.28
PM <sub>10</sub>	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	1.10	26.44	0.28	20% opacity	1.10	26.44	0.28
PM <sub>2.5</sub>	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	1.10	26.44	0.28	20% opacity	1.10	26.44	0.28
Sulfur Dioxide (SO <sub>2</sub> )	1.21E-04	lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel and All Stationary Dual-Fuel Engines	0.41	9.76	0.10	not applicable	0.41	9.76	0.10
Nitrogen Oxides (NO <sub>x</sub> )	1.05E-02	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1 - assumes NMHC+NOx is all NOx	35.25	845.93	8.81	not applicable	35.25	845.93	8.81
Carbon Monoxide (CO)	5.75E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1	19.28	462.62	4.82	not applicable	19.28	462.62	4.82
VOC*	2.47E-03	lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines	8.27	198.59	2.07	not applicable	8.27	198.59	2.07

\*NOTE: Emission factor for VOC is assumed to be equal to the emission factor for Total Organic Carbon (TOC) in the exhaust. This would be a conservative estimate as not all TOC is VOC.

100-hp emergency generator for emergency evacuation hoists

Process Information		
Process Rate:	500	hr/yr
Engine power output:	100	hp
Sulfur Content	0.015	percent

Non-Criteria Pollutant Emission Limits

opacity	<20%
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Tier 3 Engine - 40 CFR 89.112

Power Rating range: 37< kW < 75

Emission Standards

Non-methane hydrocarbon + NOx:	4.7 g/kW-hr	7.73E-03 lb/hp-hr
CO:	5 g/kW-hr	8.22E-03 lb/hp-hr
PM:	0.40 g/kW-hr	6.58E-04 lb/hp-hr

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions		
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)
PM	6.58E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.07	1.58	0.02	20% opacity	0.07	1.58	0.02
PM <sub>10</sub>	6.58E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.07	1.58	0.02	20% opacity	0.07	1.58	0.02
PM <sub>2.5</sub>	6.58E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.07	1.58	0.02	20% opacity	0.07	1.58	0.02
Sulfur Dioxide (SO <sub>2</sub> )	1.21E-04	lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel and All Stationary Dual-Fuel Engines	0.01	0.29	0.00	not applicable	0.01	0.29	0.003
Nitrogen Oxides (NO <sub>x</sub> )	7.73E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1 assumes NMHC+NOx is all NOx	0.77	18.54	0.19	not applicable	0.77	18.54	0.19
Carbon Monoxide (CO)	8.22E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1	0.82	19.73	0.21	not applicable	0.82	19.73	0.21
VOC*	2.47E-03	lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines	0.25	5.93	0.06	not applicable	0.25	5.93	0.06

\*NOTE: Emission factor for VOC is assumed to be equal to the emission factor for Total Organic Carbon (TOC) in the exhaust. This would be a conservative estimate as not all TOC is VOC.

50-hp fire pump engine (emergency use)

Process Information		
Process Rate:	500	hr/yr
Engine power output:	50	hp
Sulfur Content	0.015	percent

Non-Criteria Pollutant Emission Limits	
opacity	<20%

Tier 3 Engine - 40 CFR 89.112

Power Rating range: 37 < kW < 75

Emission Standards

Non-methane hydrocarbon + NOx:	4.7 g/kW-hr	7.73E-03 lb/hp-hr
CO:	5 g/kW-hr	8.22E-03 lb/hp-hr
PM:	0.40 g/kW-hr	6.58E-04 lb/hp-hr

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions		
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)
PM	6.58E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.03	0.79	0.01	20% opacity	0.03	0.79	0.01
PM <sub>10</sub>	6.58E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.03	0.79	0.01	20% opacity	0.03	0.79	0.01
PM <sub>2.5</sub>	6.58E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.03	0.79	0.01	20% opacity	0.03	0.79	0.01
Sulfur Dioxide (SO <sub>2</sub> )	1.21E-04	lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel and All Stationary Dual-Fuel Engines	0.01	0.15	0.00	not applicable	0.01	0.15	0.0015
Nitrogen Oxides (NO <sub>x</sub> )	7.73E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1 - assumes NMHC+NOx is all NOx	0.39	9.27	0.10	not applicable	0.39	9.27	0.10
Carbon Monoxide (CO)	8.22E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1	0.41	9.86	0.10	not applicable	0.41	9.86	0.10
VOC*	2.47E-03	lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines	0.12	2.96	0.03	not applicable	0.12	2.96	0.03

\*NOTE: Emission factor for VOC is assumed to be equal to the emission factor for Total Organic Carbon (TOC) in the exhaust. This would be a conservative estimate as not all TOC is VOC.

P10A

Tintina Montana Inc. Black Butte Copper Project

**EMISSIONS CALCULATIONS**

Propane-fired heater at Intake Vent for Upper Copper Zone

Max. Fuel Combustion Rate =	23.00 MMBtu/hr
Fuel Usage =	1,281.33 10 <sup>3</sup> gal/yr
Hours of Operation =	<b>5,088 hr/yr</b>
Fuel High Heating Value=	91.33 MMBtu/10 <sup>3</sup> gal
Conversions:	454 grams/lb
	2000 lbs/ton

**Criteria Pollutants (HAPs)**

Pollutant	Emission Factor	Units	Emission Factor Reference	Emissions (lbs/hr)	Emissions (tons/yr)
PM/PM10/PM2.5	0.7	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.176	0.45
NOx	13	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	3.27	8.33
CO	7.5	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	1.89	4.80
VOC	1	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.25	0.64
SO <sub>2</sub>	0.054	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.01	0.03
CO <sub>2</sub>	12500.0	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	3.15E+03	8008.32
CH <sub>4</sub>	0.2	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	5.04E-02	0.13
N <sub>2</sub> O	0.9	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	2.27E-01	0.58
Total CO <sub>2</sub> e	12783.2	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	3.22E+03	8189.76

**Sample Calculation:**

PM Emissions = (Emission Factor, lbs/MMscf) / (Fuel Heating Value, MMBtu/MMscf) x (Fuel Combustion Rate MMBtu/hr)

PM Emissions (lb/hr) = (0.7 lb/MMscf) / (91.33 MMBtu/MMscf) x (23 MMBtu/hr) = 0.1763 lbs/hr

PM Emissions (tons/yr) = (0.1763 lbs/hr) x (5088 hrs/yr) / (2000 lbs/ton) = 0.448 tons/yr

P10B

Tintina Montana Inc. Black Butte Copper Project

**EMISSIONS CALCULATIONS**

Propane-fired heater at Intake Vent for Lower Copper Zone

Max. Fuel Combustion Rate =	52.00 MMBtu/hr
Fuel Usage =	2,896.92 10 <sup>3</sup> gal/yr
Hours of Operation =	5,088 hr/yr
Fuel High Heating Value=	91.33 MMBtu/10 <sup>3</sup> gal
Conversions:	454 grams/lb
	2000 lbs/ton

**Criteria Pollutants (HAPs)**

Pollutant	Emission Factor	Units	Emission Factor Reference	Emissions (lbs/hr)	Emissions (tons/yr)
PM/PM10/PM2.5	0.7	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.40	1.01
NOx	13	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	7.40	18.83
CO	7.5	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	4.27	10.86
VOC	1	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.57	1.45
SO <sub>2</sub>	0.054	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.03	0.08
CO <sub>2</sub>	12500.0	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	7117.05	18105.77
CH <sub>4</sub>	0.2	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.11	0.29
N <sub>2</sub> O	0.9	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.51	1.30
Total CO <sub>2</sub> e	12783.2	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	7278.29	18515.97

**Sample Calculation:**

PM Emissions = (Emission Factor, lbs/MMscf) / (Fuel Heating Value, MMBtu/MMscf) x (Fuel Combustion Rate MMBtu/hr)

PM Emissions (lb/hr) = (0.7 lb/MMscf) / (91.33 MMBtu/MMscf) x (52 MMBtu/hr) = 0.3986 lbs/hr

PM Emissions (tons/yr) = (0.3986 lbs/hr) x (5088 hrs/yr) / (2000 lbs/ton) = 1.014 tons/yr



P11

Tintina Montana Inc. Black Butte Copper Project

**EMISSIONS CALCULATIONS**

Temporary Diesel-fired Heaters at Portal (1.2 MMBtu/hr total between 3)

Max. Fuel Combustion Rate =	1.20 MMBtu/hr
Fuel Usage =	75.30 10 <sup>3</sup> gal/yr
Hours of Operation =	8,760 hr/yr
Fuel High Heating Value=	139.60 MMBtu/10 <sup>3</sup> gal
Conversions:	454 grams/lb
	2000 lbs/ton

**Criteria Pollutants (HAPs)**

Pollutant	Emission Factor	Units	Emission Factor Reference	Emissions (lbs/hr)	Emissions (tons/yr)
PM/PM10/PM2.5	1.3	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.01	0.05
NOx	20	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.17	0.75
CO	5	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.04	0.19
VOC	0.556	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.00	0.02
SO <sub>2</sub>	2.13	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.02	0.08
CO <sub>2</sub>	22300.0	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	191.69	839.60
CH <sub>4</sub>	0.2	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.00	0.01
N <sub>2</sub> O	0.3	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.00	0.01
Total CO <sub>2</sub> e	22385.1	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	192.42	842.81

EMISSIONS CALCULATIONS

Source Name: **Jaw Crusher (enclosed in crushing building, vented to dust collector)**  
 Source Description: **Jaw Crusher Dust Collection System/Dust Collector**  
 Pollutants: **PM/PM10/PM2.5**  
 Emission Factor From: **BACT Determination**

**Explanation:** BACT for these types/sizes of dust collectors was determined to be 0.01 grains per dry standard cubic foot. The other particulate fractions are also conservatively assumed to also be 0.01 gr/dscf.

Emissions are from the jaw crusher (enclosed in the crushing building) vented through the dust collection system

Emissions are calculated by multiplying the emission factors by the maximum flow rating of the baghouse in standard cubic feet per minute. This yields an emissions rate in grains per minute. To generate a short term emission rate in pounds per hour, the calculated emission rate is multiplied by 60 minutes per hour, which is subsequently divided by 7000 grains per pound. To generate an annual emission rate, the short term emission rate is multiplied by the number of hours of operation per year in which the process will be performed (by default, 8760, unless otherwise limited). This yields an emission rate in pounds per year, which is subsequently divided by 2000 to yield tons per year.

PM Emission Factor = **0.01 gr/dscf**  
**8,500 scfm**

PM<sub>10</sub> Emission Factor = **0.010 gr/dscf**  
**8,500 scfm**

PM<sub>2.5</sub> Emission Factor = **0.010 gr/dscf**  
**8,500 scfm**

Short Term Emissions: **pound per hour = (baghouse flow rate scfm)\*(grain load gr/dscf)/(7000 gr/lb)\*(60 min/hr)**

Annual Emissions: **tons per year = (Short Term emission)(8760 hr/yr)/(2000 lb/ton)**

Annual PM EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
3.19	0.092	0.73	0.092

Annual PM <sub>10</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
3.19	0.092	0.73	0.092

Annual PM <sub>2.5</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
3.19	0.092	0.73	0.092

P13A

Tintina Montana Inc. Black Butte Copper Project

EMISSIONS CALCULATIONS

Source Name: P13A  
 Source Description: Mill Building Lime Silo Dust Collector  
 Pollutants: PM/PM10/PM2.5  
 Emission Factor From: BACT Determination

**Explanation:** BACT for these types/sizes of dust collectors was determined to be 0.01 grains per dry standard cubic foot. The other particulate fractions are also conservatively assumed to also be 0.01 gr/dscf.

Emissions are from the mill building lime silo dust collection system

Emissions are calculated by multiplying the emission factors by the maximum flow rating of the baghouse in standard cubic feet per minute. This yields an emissions rate in grains per minute. To generate a short term emission rate in pounds per hour, the calculated emission rate is multiplied by 60 minutes per hour, which is subsequently divided by 7000 grains per pound. To generate an annual emission rate, the short term emission rate is multiplied by the number of hours of operation per year in which the process will be performed (by default, 8760, unless otherwise limited). This yields an emission rate in pounds per year, which is subsequently divided by 2000 to yield tons per year.

PM Emission Factor = 0.01 gr/dscf  
 500 scfm

PM<sub>10</sub> Emission Factor = 0.010 gr/dscf  
 500 scfm

PM<sub>2.5</sub> Emission Factor = 0.010 gr/dscf  
 500 scfm

Short Term Emissions: pound per hour = (baghouse flow rate scfm)\*(grain load gr/dscf)/(7000 gr/lb)\*(60 min/hr)

Annual Emissions: tons per year = (Short Term emission)(8760 hr/yr)/(2000 lb/ton)

Annual PM EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
0.19	0.005	0.04	0.005

Annual PM <sub>10</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
0.19	0.005	0.04	0.005

Annual PM <sub>2.5</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
0.19	0.005	0.04	0.005

**P13B**  
**Tintina Montana Inc. Black Butte Copper Project**  
**Tintina Mine Air Permit Application**

**EMISSIONS CALCULATIONS**

**Source Name:** P13B  
**Source Description:** Mill Building Lime Area Dust Collector  
**Pollutants:** PM/PM10/PM2.5  
**Emission Factor From:** BACT Determination

**Explanation:** BACT for these types/sizes of dust collectors was determined to be 0.01 grains per dry standard cubic foot. The other particulate fractions are also conservatively assumed to also be 0.01 gr/dscf.

Emissions are from the mill building lime silo dust collection system

Emissions are calculated by multiplying the emission factors by the maximum flow rating of the baghouse in standard cubic feet per minute. This yields an emissions rate in grains per minute. To generate a short term emission rate in pounds per hour, the calculated emission rate is multiplied by 60 minutes per hour, which is subsequently divided by 7000 grains per pound. To generate an annual emission rate, the short term emission rate is multiplied by the number of hours of operation per year in which the process will be performed (by default, 8760, unless otherwise limited). This yields an emission rate in pounds per year, which is subsequently divided by 2000 to yield tons per year.

**PM Emission Factor =** 0.01 gr/dscf  
 3,300 scfm

**PM<sub>10</sub> Emission Factor =** 0.010 gr/dscf  
 3,300 scfm

**PM<sub>2.5</sub> Emission Factor =** 0.010 gr/dscf  
 3,300 scfm

**Short Term Emissions:** pound per hour = (baghouse flow rate scfm)\*(grain load gr/dscf)/(7000 gr/lb)\*(60 min/hr)

**Annual Emissions:** tons per year = (Short Term emission)(8760 hr/yr)/(2000 lb/ton)

Annual PM EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
1.24	0.036	0.28	0.036

Annual PM <sub>10</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
1.24	0.036	0.28	0.036

Annual PM <sub>2.5</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
1.24	0.036	0.28	0.036

EMISSIONS CALCULATIONS

Source Name: **Crushed Ore - Surge Bin (2500 ton total capacity)**  
 Source Description: **Crushed Ore - Surge Bin Dust Collection System/Dust Collector**  
 Pollutants: **PM/PM10/PM2.5**  
 Emission Factor From: **BACT Determination**

**Explanation:** BACT for these types/sizes of dust collectors was determined to be 0.01 grains per dry standard cubic foot. The other particulate fractions are also conservatively assumed to also be 0.01 gr/dscf.

Emissions are from the crushed ore surge bin dust collection system

Emissions are calculated by multiplying the emission factors by the maximum flow rating of the baghouse in standard cubic feet per minute. This yields an emissions rate in grains per minute. To generate a short term emission rate in pounds per hour, the calculated emission rate is multiplied by 60 minutes per hour, which is subsequently divided by 7000 grains per pound. To generate an annual emission rate, the short term emission rate is multiplied by the number of hours of operation per year in which the process will be performed (by default, 8760, unless otherwise limited). This yields an emission rate in pounds per year, which is subsequently divided by 2000 to yield tons per year.

PM Emission Factor = **0.01 gr/dscf**  
**5,000 scfm**

PM<sub>10</sub> Emission Factor = **0.010 gr/dscf**  
**5,000 scfm**

PM<sub>2.5</sub> Emission Factor = **0.010 gr/dscf**  
**5,000 scfm**

Short Term Emissions: **pound per hour = (baghouse flow rate scfm)\*(grain load gr/dscf)/(7000 gr/lb)\*(60 min/hr)**

Annual Emissions: **tons per year = (Short Term emission)(8760 hr/yr)/(2000 lb/ton)**

Annual PM EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
1.88	0.054	0.43	0.054

Annual PM <sub>10</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
1.88	0.054	0.43	0.054

Annual PM <sub>2.5</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
1.88	0.054	0.43	0.054

P15  
Tintina Montana Inc. Black Butte Copper Project  
Tintina Mine Air Permit Application

**EMISSIONS CALCULATIONS**

**Source Name:** P15  
**Source Description:** Water Treatment Plant - Lime Area Dust Collector  
**Pollutants:** PM/PM10/PM2.5  
**Emission Factor From:** BACT Determination

**Explanation:** BACT for these types/sizes of dust collectors was determined to be 0.01 grains per dry standard cubic foot. The other particulate fractions are also conservatively assumed to also be 0.01 gr/dscf.

Emissions are from the lime area dust collection system

Emissions are calculated by multiplying the emission factors by the maximum flow rating of the baghouse in standard cubic feet per minute. This yields an emissions rate in grains per minute. To generate a short term emission rate in pounds per hour, the calculated emission rate is multiplied by 60 minutes per hour, which is subsequently divided by 7000 grains per pound. To generate an annual emission rate, the short term emission rate is multiplied by the number of hours of operation per year in which the process will be performed (by default, 8760, unless otherwise limited). This yields an emission rate in pounds per year, which is subsequently divided by 2000 to yield tons per year.

**PM Emission Factor =** 0.01 gr/dscf  
3,300 scfm

**PM<sub>10</sub> Emission Factor =** 0.010 gr/dscf  
3,300 scfm

**PM<sub>2.5</sub> Emission Factor =** 0.010 gr/dscf  
3,300 scfm

**Short Term Emissions:** pound per hour = (baghouse flow rate scfm)\*(grain load gr/dscf)/(7000 gr/lb)\*(60 min/hr)

**Annual Emissions:** tons per year = (Short Term emission)(8760 hr/yr)/(2000 lb/ton)

Annual PM EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
1.24	0.036	0.28	0.036

Annual PM <sub>10</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
1.24	0.036	0.28	0.036

Annual PM <sub>2.5</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
1.24	0.036	0.28	0.036

P16A  
Tintina Montana Inc. Black Butte Copper Project  
Tintina Mine Air Permit Application

**EMISSIONS CALCULATIONS**

**Source Name:** P16A  
**Source Description:** Backfill Plant - Cement Hopper dust collector  
**Pollutants:** PM/PM10/PM2.5  
**Emission Factor From:** BACT Determination

**Explanation:** BACT for these types/sizes of dust collectors was determined to be 0.01 grains per dry standard cubic foot. The other particulate fractions are also conservatively assumed to also be 0.01 gr/dscf.

Emissions are from the backfill plant cement hopper dust collector

Emissions are calculated by multiplying the emission factors by the maximum flow rating of the baghouse in standard cubic feet per minute. This yields an emissions rate in grains per minute. To generate a short term emission rate in pounds per hour, the calculated emission rate is multiplied by 60 minutes per hour, which is subsequently divided by 7000 grains per pound. To generate an annual emission rate, the short term emission rate is multiplied by the number of hours of operation per year in which the process will be performed (by default, 8760, unless otherwise limited). This yields an emission rate in pounds per year, which is subsequently divided by 2000 to yield tons per year.

**PM Emission Factor =** 0.01 gr/dscf  
600 scfm

**PM<sub>10</sub> Emission Factor =** 0.010 gr/dscf  
600 scfm

**PM<sub>2.5</sub> Emission Factor =** 0.010 gr/dscf  
600 scfm

**Short Term Emissions:** pound per hour = (baghouse flow rate scfm)\*(grain load gr/dscf)/(7000 gr/lb)\*(60 min/hr)

**Annual Emissions:** tons per year = (Short Term emission)(8760 hr/yr)/(2000 lb/ton)

Annual PM EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
0.23	0.006	0.05	0.006

Annual PM <sub>10</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
0.23	0.006	0.05	0.006

Annual PM <sub>2.5</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
0.23	0.006	0.05	0.006

**P16B**  
**Tintina Montana Inc. Black Butte Copper Project**

**EMISSIONS CALCULATIONS**

**Source Name:** P16B  
**Source Description:** Backfill Plant -Cement silo dust collector  
**Pollutants:** PM/PM10/PM2.5  
**Emission Factor From:** BACT Determination

**Explanation:** BACT for these types/sizes of dust collectors was determined to be 0.01 grains per dry standard cubic foot. The other particulate fractions are also conservatively assumed to also be 0.01 gr/dscf.

Emissions are from the cement silo dust collector

Emissions are calculated by multiplying the emission factors by the maximum flow rating of the baghouse in standard cubic feet per minute. This yields an emissions rate in grains per minute. To generate a short term emission rate in pounds per hour, the calculated emission rate is multiplied by 60 minutes per hour, which is subsequently divided by 7000 grains per pound. To generate an annual emission rate, the short term emission rate is multiplied by the number of hours of operation per year in which the process will be performed (by default, 8760, unless otherwise limited). This yields an emission rate in pounds per year, which is subsequently divided by 2000 to yield tons per year.

**PM Emission Factor =** 0.01 gr/dscf  
 1,200 scfm

**PM<sub>10</sub> Emission Factor =** 0.010 gr/dscf  
 1,200 scfm

**PM<sub>2.5</sub> Emission Factor =** 0.010 gr/dscf  
 1,200 scfm

**Short Term Emissions:** pound per hour = (baghouse flow rate scfm)\*(grain load gr/dscf)/(7000 gr/lb)\*(60 min/hr)

**Annual Emissions:** tons per year = (Short Term emission)(8760 hr/yr)/(2000 lb/ton)

Annual PM EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
0.45	0.013	0.10	0.013

Annual PM <sub>10</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
0.45	0.013	0.10	0.013

Annual PM <sub>2.5</sub> EMISSIONS		Short Term	
( TPY)	(g/s)	lb/hr	g/s
0.45	0.013	0.10	0.013



**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**4 100-hp portable engine/generators**

Process Information		
Process Rate:	8,760	hr/yr
Engine power output:	400	hp
Sulfur Content	0.015	percent

(Total for all four engines)

Non-Criteria Pollutant Emission Limits	
opacity	<20%

**Tier 3 Engine - 40 CFR 89.112**

Power Rating range: 37< kW < 75

**Emission Standards**

Non-methane hydrocarbon + NOx:	4.7 g/kW-hr	7.73E-03 lb/hp-hr
CO:	5 g/kW-hr	8.22E-03 lb/hp-hr
PM:	0.40 g/kW-hr	6.58E-04 lb/hp-hr

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions		
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)
PM	6.58E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.26	6.31	1.15	20% opacity	0.26	6.31	1.15
PM <sub>10</sub>	6.58E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.26	6.31	1.15	20% opacity	0.26	6.31	1.15
PM <sub>2.5</sub>	6.58E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.26	6.31	1.15	20% opacity	0.26	6.31	1.15
Sulfur Dioxide (SO <sub>2</sub> )	1.21E-04	lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel and All Stationary Dual-Fuel Engines	0.05	1.16	0.21	not applicable	0.05	1.16	0.21
Nitrogen Oxides (NO <sub>x</sub> )	7.73E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1 assumes NMHC+NO <sub>x</sub> is all NO <sub>x</sub>	3.09	74.18	13.54	not applicable	3.09	74.18	13.54
Carbon Monoxide (CO)	8.22E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1	3.29	78.91	14.40	not applicable	3.29	78.91	14.40
VOC*	2.47E-03	lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines	0.99	23.71	4.33	not applicable	0.99	23.71	4.33

\*NOTE: Emission factor for VOC is assumed to be equal to the emission factor for Total Organic Carbon (TOC) in the exhaust. This would be a conservative estimate as not all TOC is VOC.

P18

**Air Emissions Calculations**

Tintina Montana Inc. Black Butte Copper Project

**Air Compressor - Diesel Engine 275 hp**

Process Information		
Process Rate:	8,760	hr/yr
Engine power output:	275	hp
Sulfur Content	0.015	percent

(Total for all four engines)

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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**Tier 3 Engine - 40 CFR 89.112**

Power Rating range: 130< kW < 225

**Emission Standards**

Non-methane hydrocarbon + NOx:	4.0 g/kW-hr	6.58E-03 lb/hp-hr
CO:	3.5 g/kW-hr	5.75E-03 lb/hp-hr
PM:	0.20 g/kW-hr	3.29E-04 lb/hp-hr

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions		
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)
PM	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.09	2.17	0.40	20% opacity	0.09	2.17	0.40
PM <sub>10</sub>	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.09	2.17	0.40	20% opacity	0.09	2.17	0.40
PM <sub>2.5</sub>	3.29E-04	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.09	2.17	0.40	20% opacity	0.09	2.17	0.40
Sulfur Dioxide (SO <sub>2</sub> )	1.21E-04	lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel and All Stationary Dual-Fuel Engines	0.03	0.80	0.15	not applicable	0.03	0.80	0.15
Nitrogen Oxides (NO <sub>x</sub> )	6.58E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1 assumes NMHC+NOx is all NOx	1.81	43.40	7.92	not applicable	1.81	43.40	7.92
Carbon Monoxide (CO)	5.75E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1	1.58	37.98	6.93	not applicable	1.58	37.98	6.93
VOC*	2.47E-03	lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines	0.68	16.30	2.98	not applicable	0.68	16.30	2.98

UG ANFO  
Blasting

8.5 blasts per day, full production, worst case  
 0.5 ton of ANFO per blast (1000 lbs)  
 289 A= horizontal area (ft<sup>2</sup>), with blasting depth ≤ 70ft (based on 17'x17' heading)

		Emission factor lb/blast	EF Source	EF Comments	lb/hr (averaged over a day)	Max lb/day	tpy
Based on blasts	PM	0.069	AP-42, Table 11.9-1	EF = (0.000014(A) <sup>1.5</sup> )	0.024	0.585	0.11
	PM10	0.036	AP-42, Table 11.9-2	PM10/PM scaling factor = 0.52	0.013	0.304	0.06
	PM2.5	0.002	AP-42, Table 11.9-3	PM2.5/PM scaling factor = 0.03	0.001	0.018	0.00
Based on ANFO	lb/ton of ANFO						
	CO	67	AP-42, Table 13.3-1		11.86	284.75	51.97
	NOx	17	AP-42, Table 13.3-2		3.01	72.25	13.19
	SO2	2	AP-42, Table 13.3-3		0.35	8.50	1.55

UG \_ Mobile Sources

EMISSIONS CALCULATIONS

Underground sources

Underground equipment (Table 3-7)

Upper Zone	Est. engine horsepower (hp)	Number of units	EPA Load Factor (fraction of power)	Equipment Availability and Use of Availability	Available hours per day	Annual Operating Schedule days/yr	PM10/PM2.5			NOx			CO			SO2			VOC							
							EPA Tier 3 Emission factor g/hp-hr	lb/hr	lb/day	tpy	EPA Tier 3 Emission factor g/hp-hr	lb/hr	lb/day	tpy	EPA Tier 3 Emission factor g/hp-hr	lb/hr	lb/day	tpy	Emission factor lb/hp-hr	lb/hr	lb/day	tpy	Emission factor lb/hp-hr	lb/hr	lb/day	tpy
2 Boom Jumbo	118	2	0.21	67.29%	16.1496	365	0.22	0.0240	0.388	0.071	3.0	0.3278	5.294	0.966	3.7	0.4043	6.529	1.192	1.21E-04	0.0060	0.097	0.018	2.47E-03	0.1224	1.977	0.361
Mechanized bolter	150	3	0.21	67.29%	16.1496	365	0.22	0.0458	0.740	0.135	3.0	0.6250	10.094	1.842	3.7	0.7709	12.449	2.272	1.21E-04	0.0115	0.185	0.034	2.47E-03	0.2334	3.770	0.688
7-cu yard LHD	250	2	0.43	67.29%	16.1496	365	0.15	0.0711	1.148	0.210	3.0	1.4220	22.965	4.191	2.6	1.2324	19.903	3.632	1.21E-04	0.0261	0.421	0.077	2.47E-03	0.5311	8.576	1.565
Scissor truck	150	3	0.21	67.29%	16.1496	365	0.22	0.0458	0.740	0.135	3.0	0.6250	10.094	1.842	3.7	0.7709	12.449	2.272	1.21E-04	0.0115	0.185	0.034	2.47E-03	0.2334	3.770	0.688
44-ton haul truck (40-tonne haul truck)	465	4	0.59	67.29%	16.1496	365	0.15	0.3629	5.861	1.070	3.0	7.2581	117.215	21.392	2.6	6.2904	101.587	18.540	1.21E-04	0.1332	2.151	0.392	2.47E-03	2.7106	43.775	7.989
ANFO Loader	150	1	0.21	67.29%	16.1496	365	0.22	0.0153	0.247	0.045	3.0	0.2083	3.365	0.614	3.7	0.2570	4.150	0.757	1.21E-04	0.0038	0.062	0.011	2.47E-03	0.0778	1.257	0.229
Lower Zone																										
2 Boom Jumbo	118	1	0.21	67.29%	16.1496	365	0.22	0.0120	0.194	0.035	3.0	0.1639	2.647	0.483	3.7	0.2021	3.264	0.596	1.21E-04	0.0030	0.049	0.009	2.47E-03	0.0612	0.988	0.180
Mechanized bolter	150	2	0.21	67.29%	16.1496	365	0.22	0.0306	0.493	0.090	3.0	0.4167	6.729	1.228	3.7	0.5139	8.299	1.515	1.21E-04	0.0076	0.123	0.023	2.47E-03	0.1556	2.513	0.459
7-cu yard LHD	250	1	0.43	67.29%	16.1496	365	0.15	0.0355	0.574	0.105	3.0	0.7110	11.482	2.096	2.6	0.6162	9.951	1.816	1.21E-04	0.0130	0.211	0.038	2.47E-03	0.2655	4.288	0.793
5-cu yard LHD	150	2	0.43	67.29%	16.1496	365	0.22	0.0626	1.010	0.184	3.0	0.8532	13.779	2.515	3.7	1.0523	16.994	3.101	1.21E-04	0.0157	0.253	0.046	2.47E-03	0.3186	5.146	0.939
Scissor truck	150	2	0.21	67.29%	16.1496	365	0.22	0.0306	0.493	0.090	3.0	0.4167	6.729	1.228	3.7	0.5139	8.299	1.515	1.21E-04	0.0076	0.123	0.023	2.47E-03	0.1556	2.513	0.459
44-ton haul truck (40-tonne haul truck)	465	2	0.59	67.29%	16.1496	365	0.15	0.1815	2.930	0.535	3.0	3.6290	58.608	10.696	2.6	3.1452	50.793	9.270	1.21E-04	0.0666	1.075	0.196	2.47E-03	1.3553	21.887	3.994
ANFO Loader	150	1	0.21	67.29%	16.1496	365	0.22	0.0153	0.247	0.045	3.0	0.2083	3.365	0.614	3.7	0.2570	4.150	0.757	1.21E-04	0.0038	0.062	0.011	2.47E-03	0.0778	1.257	0.229
Shared upper and lower zone equipment																										
Raise bore, Alimak	300	1	0.21	67.29%	16.1496	365	0.15	0.0208	0.336	0.061	3.0	0.4167	6.729	1.228	2.6	0.3611	5.832	1.064	1.21E-04	0.0076	0.123	0.023	2.47E-03	0.1556	2.513	0.459
Forklift	150	1	0.59	67.29%	16.1496	365	0.22	0.0429	0.693	0.127	3.0	0.5853	9.453	1.725	3.7	0.7219	11.659	2.128	1.21E-04	0.0107	0.173	0.032	2.47E-03	0.2186	3.530	0.644
Boom truck	300	2	0.21	67.29%	16.1496	365	0.15	0.0417	0.673	0.123	3.0	0.8334	13.458	2.456	2.6	0.7222	11.664	2.129	1.21E-04	0.0153	0.247	0.045	2.47E-03	0.3112	5.026	0.917
Grader	220	1	0.59	67.29%	16.1496	365	0.15	0.0429	0.693	0.127	3.0	0.8585	13.864	2.530	2.6	0.7440	12.016	2.193	1.21E-04	0.0158	0.254	0.046	2.47E-03	0.3206	5.178	0.945
Transmixer	114	2	0.43	67.29%	16.1496	365	0.22	0.0476	0.768	0.140	3.0	0.6484	10.472	1.911	3.7	0.7997	12.915	2.357	1.21E-04	0.0119	0.192	0.035	2.47E-03	0.2422	3.911	0.714
Shotcrete sprayer	7	2	0.21	67.29%	16.1496	365	0.75	0.0049	0.079	0.014	5.6	0.0363	0.586	0.107	6.0	0.0389	0.628	0.115	1.21E-04	0.0004	0.006	0.001	2.47E-03	0.0073	0.117	0.021
Pressure grouting equipment	100	1	0.21	67.29%	16.1496	365	0.22	0.0102	0.164	0.030	3.0	0.1713	2.243	0.409	3.7	0.1713	2.766	0.505	1.21E-04	0.0025	0.041	0.008	2.47E-03	0.0519	0.838	0.153
Fuel/lube truck	150	1	0.59	67.29%	16.1496	365	0.22	0.0429	0.693	0.127	3.0	0.5853	9.453	1.725	3.7	0.7219	11.659	2.128	1.21E-04	0.0107	0.173	0.032	2.47E-03	0.2186	3.530	0.644
Underground light truck	150	4	0.21	67.29%	16.1496	365	0.22	0.0611	0.987	0.180	3.0	0.8334	13.458	2.456	3.7	1.0278	16.599	3.029	1.21E-04	0.0153	0.247	0.045	2.47E-03	0.3112	5.026	0.917
Maintenance/elect trucks	150	4	0.21	67.29%	16.1496	365	0.22	0.0611	0.987	0.180	3.0	0.8334	13.458	2.456	3.7	1.0278	16.599	3.029	1.21E-04	0.0153	0.247	0.045	2.47E-03	0.3112	5.026	0.917
Supervisor vehicles	150	4	0.59	67.29%	16.1496	365	0.22	0.1717	2.773	0.506	3.0	2.3413	37.811	6.901	3.7	2.8876	46.634	8.511	1.21E-04	0.0430	0.694	0.147	2.47E-03	0.8744	14.121	2.577
Engineering/geology	150	3	0.59	67.29%	16.1496	365	0.22	0.1288	2.080	0.380	3.0	1.7560	28.359	5.175	3.7	2.1657	34.976	6.383	1.21E-04	0.0322	0.520	0.095	2.47E-03	0.6558	10.591	1.933
Total underground mobile sources								1.61	25.99	4.74		26.73	431.71	78.79		27.42	442.76	80.80		0.49	7.92	1.44		9.98	161.12	29.40

Notes

<sup>1</sup> 12 hour/shift, 2 shifts per day, 0.5 hr lunch, 50 min per hour operation, = 9.5 effective hour/12 hour shift

Availability means the availability of unit due to maintenance or other downtime. Use of availability means percent use of available unit operation time

<sup>2</sup> 24-hours per day, 365 days per year, unless otherwise specified by EPA's NONROAD2008a Load Factor and Activity Estimates

<sup>3</sup> PM2.5 assumed to be equal to PM10 for combustion sources

<sup>4</sup> ACFM calculated using the following conversion:  $V_2/V_1 = (T_2/T_1)^{0.7} \cdot (P_1/P_2)^{1.0}$  [(1-M/100)]

Use of Avail

79.16%

Availability

85.00%

Total Availability per Day

67.29%

NONROAD2008a Load Factors Used in Mobile Source Underground Emissions Estimates

Load Factor and Activity Estimates in NONROAD2008a

SCC	Equipment Description	Load Factor (fraction of power)	Activity (hours/year)
2265004066	4-Stroke Chippers/Stump Grinders (Comm.)	0.78	488
2265004070	4-Stroke Commercial Turf Equipment (Res.)	0.60	682
2265004071	4-Stroke Commercial Turf Equipment (Comm)	0.60	682
2265004075	4-Stroke Other Lawn & Garden Equipment	0.58	61
2265004076	4-Stroke Other Lawn & Garden Equipment	0.58	61
2265005010	4-Stroke 2-Wheel Tractors	0.62	286
2265005015	4-Stroke Agricultural Tractors	0.62	550
2265005020	4-Stroke Combines	0.74	125
2265005025	4-Stroke Balers	0.62	68
2265005030	4-Stroke Agricultural Mowers	0.48	175
2265005035	4-Stroke Sprayers	0.65	80
2265005040	4-Stroke Tillers > 5 HP	0.71	43
2265005045	4-Stroke Swathers	0.52	95
2265005055	4-Stroke Other Agricultural Equipment	0.55	124
2265005060	4-Stroke Irrigation Sets	0.60	716
2265006005	4-Stroke Light Commercial Generator Sets	0.68	115
2265006010	4-Stroke Light Commercial Pumps	0.69	221
2265006015	4-Stroke Light Commercial Air Compressors	0.56	484
2265006020	4-Stroke Light Commercial Gas Compressors	0.85	6000
2265006025	4-Stroke Light Commercial Welders	0.68	408
2265006030	4-Stroke Light Commercial Pressure Washers	0.85	115
2265006035	4-Stroke Hydro Power Units	0.56	450
2265007005	4-Stroke Logging Equipment Chain Saws > 6 HP	0.70	303
2265007010	4-Stroke Logging Equipment Shredders > 6 HP	0.80	50
2265007015	4-Stroke Logging Equipment Skidders	0.70	350
2265007020	4-Stroke Logging Equipment Fellers/Bunchers	0.70	0
2265008005	4-Stroke Airport Support Equipment	0.56	681
2265009010	4-Stroke Other Underground Mining Equipment	0.80	260
2265010010	4-Stroke Other Oil Field Equipment	0.90	1104
2270001020	Diesel Snowmobiles (unused)	0.34	40
2270001030	Diesel All Terrain Vehicles/MC (unused)	0.42	0
2270001050	Diesel Golf Carts (unused)	0.49	1150
2270001060	Diesel Specialty Vehicle Carts	0.21	435
2270002003	Diesel Pavers	0.59	821
2270002006	Diesel Tampers/Rammers (unused)	0.43	460
2270002009	Diesel Plate Compactors	0.43	484
2270002012	Diesel Concrete Pavers (unused)	0.59	0
2270002015	Diesel Rollers	0.59	760
2270002018	Diesel Scrapers	0.59	914
2270002021	Diesel Paving Equipment	0.59	622
2270002024	Diesel Surfacing Equipment	0.59	561
2270002027	Diesel Signal Boards	0.43	535
2270002030	Diesel Trenchers	0.59	593
2270002033	Diesel Bore/Drill Rigs	0.43	466
2270002036	Diesel Excavators	0.59	1092
2270002039	Diesel Concrete/Industrial Saws	0.59	580
2270002042	Diesel Cement & Mortar Mixers	0.43	275
2270002045	Diesel Cranes	0.43	990
2270002048	Diesel Graders	0.59	962
2270002051	Diesel Off-highway Trucks	0.59	1641
2270002054	Diesel Crushing/Proc. Equipment	0.43	955
2270002057	Diesel Rough Terrain Forklifts	0.59	662

Load Factor and Activity Estimates in NONROAD2008a

SCC	Equipment Description	Load Factor (fraction of power)	Activity (hours/year)
2270002060	Diesel Rubber Tire Loaders	0.59	761
2270002063	Diesel Rubber Tire Dozers	0.59	899
2270002066	Diesel Tractors/Loaders/Backhoes	0.21	1135
2270002069	Diesel Crawler Tractors	0.59	936
2270002072	Diesel Skid Steer Loaders	0.21	818
2270002075	Diesel Off-Highway Tractors	0.59	855
2270002078	Diesel Dumpers/Tenders	0.21	566
2270002081	Diesel Other Construction Equipment	0.59	606
2270003010	Diesel Aerial Lifts	0.21	384
2270003020	Diesel Forklifts	0.59	1700
2270003030	Diesel Sweepers/Scrubbers	0.43	1220
2270003040	Diesel Other General Industrial Equipment	0.43	878
2270003050	Diesel Other Material Handling Equipment	0.21	421
2270003060	Diesel AC\Refrigeration	0.43	1341
2270003070	Diesel Terminal Tractors	0.59	1257
2270004010	Diesel Lawn mowers (Residential)	0.43	320
2270004011	Diesel Lawn mowers (Commerical)	0.43	320
2270004015	Diesel Rotary Tillers < 6 HP (Residential)	0.43	172
2270004016	Diesel Rotary Tillers < 6 HP (Commercial)	0.43	172
2270004020	Diesel Chain Saws < 6 HP (Residential)	0.43	70
2270004021	Diesel Chain Saws < 6 HP (Commercial)	0.43	70
2270004025	Diesel Trimmers/Edgers/Brush Cutters (Res.)	0.43	60
2270004026	Diesel Trimmers/Edgers/Brush Cutters (Comm.)	0.43	60
2270004030	Diesel Leafblowers/Vacuums (Residential)	0.43	120
2270004031	Diesel Leafblowers/Vacuums (Commercial)	0.43	120
2270004035	Diesel Snowblowers (Residential)	0.43	400
2270004036	Diesel Snowblowers (Commercial)	0.43	400
2270004040	Diesel Rear Engine Riding Mowers (Res.)	0.43	480
2270004041	Diesel Rear Engine Riding Mowers (Comm.)	0.43	480
2270004045	Diesel Front Mowers (Residential)	0.43	480
2270004046	Diesel Front Mowers (Commercial)	0.43	480
2270004050	Diesel Shredders < 6 HP (Residential)	0.43	120
2270004051	Diesel Shredders < 6 HP (Commercial)	0.43	120
2270004055	Diesel Lawn & Garden Tractors (Residential)	0.43	544
2270004056	Diesel Lawn & Garden Tractors (Commercial)	0.43	544
2270004060	Diesel Wood Splitters (Residential)	0.43	265
2270004061	Diesel Wood Splitters (Commercial)	0.43	265
2270004065	Diesel Chippers/Stump Grinders (Residential)	0.43	465
2270004066	Diesel Chippers/Stump Grinders (Commercial)	0.43	465
2270004070	Diesel Commercial Turf Equipment (Res.)	0.43	1068
2270004071	Diesel Commercial Turf Equipment (Comm.)	0.43	1068
2270004075	Diesel Other Lawn & Garden Equipment (Res.)	0.43	433
2270004076	Diesel Other Lawn & Garden Equipment (Comm.)	0.43	433
2270005010	Diesel 2-Wheel Tractors	0.59	544
2270005015	Diesel Agricultural Tractors	0.59	475
2270005020	Diesel Combines	0.59	150
2270005025	Diesel Balers	0.59	95
2270005030	Diesel Agricultural Mowers	0.59	363
2270005035	Diesel Sprayers	0.59	90
2270005040	Diesel Tillers > 6 HP	0.59	172
2270005045	Diesel Swathers	0.59	110
2270005055	Diesel Other Agricultural Equipment	0.59	381

Load Factor and Activity Estimates in NONROAD2008a

SCC	Equipment Description	Load Factor (fraction of power)	Activity (hours/year)
2270005060	Diesel Irrigation Sets	0.43	749
2270006005	Diesel Light Commercial Generator Sets	0.43	338
2270006010	Diesel Light Commercial Pumps	0.43	403
2270006015	Diesel Light Commercial Air Compressors	0.43	815
2270006020	Diesel Light Commercial Gas Compressors	0.43	8500
2270006025	Diesel Light Commercial Welders	0.21	643
2270006030	Diesel Light Commercial Pressure Washer	0.43	145
2270006035	Diesel Hydro Power Units	0.43	790
2270007005	Diesel Logging Equipment Chain Saws > 6 HP	0.59	70
2270007010	Diesel Logging Equipment Shredders > 6 HP	0.59	120
2270007015	Diesel Logging Equip Fell/Bunch/Skidlers	0.59	1276
2270007020	Diesel Logging Equip Fell/Bunch (unused)	0.59	0
2270008005	Diesel Airport Support Equipment	0.59	732
2270009010	Diesel Other Underground Mining Equipment	0.21	1533
2270010010	Diesel Other Oil Field Equipment	0.43	1231
2267001020	LPG Snowmobiles	0.34	40
2267001050	LPG Golf Carts	0.46	1080
2267001060	LPG Specialty Vehicle Carts	0.58	65
2267002003	LPG Asphalt Pavers	0.66	392
2267002006	LPG Tampers/Rammers	0.55	160
2267002009	LPG Plate Compactors	0.55	166
2267002012	LPG Concrete Pavers	0.55	0
2267002015	LPG Rollers	0.62	621
2267002018	LPG Scrapers	0.70	540
2267002021	LPG Paving Equipment	0.59	175
2267002024	LPG Surfacing Equipment	0.49	488
2267002027	LPG Signal Boards	0.72	318
2267002030	LPG Trenchers	0.66	402
2267002033	LPG Bore/Drill Rigs	0.79	107
2267002036	LPG Excavators	0.59	378
2267002039	LPG Concrete/Industrial Saws	0.78	610
2267002042	LPG Cement & Mortar Mixers	0.59	84
2267002045	LPG Cranes	0.47	415
2267002048	LPG Graders	0.64	504
2267002051	LPG Off-highway Trucks	0.80	450
2267002054	LPG Crushing/Proc. Equipment	0.85	241
2267002057	LPG Rough Terrain Forklifts	0.63	413
2267002060	LPG Rubber Tire Loaders	0.71	512
2267002063	LPG Rubber Tire Dozers	0.75	900
2267002066	LPG Tractors/Loaders/Backhoes	0.48	870
2267002069	LPG Crawler Tractors	0.80	700
2267002072	LPG Skid Steer Loaders	0.58	310
2267002075	LPG Off-Highway Tractors	0.70	155
2267002078	LPG Dumpers/Tenders	0.41	127
2267002081	LPG Other Construction Equipment	0.48	371
2267003010	LPG Aerial Lifts	0.46	361
2267003020	LPG Forklifts	0.30	1800
2267003030	LPG Sweepers/Scrubbers	0.71	516
2267003040	LPG Other General Industrial Equipment	0.54	713
2267003050	LPG Other Material Handling Equipment	0.53	386
2267003060	LPG AC\Refrigeration	0.46	605
2267003070	LPG Terminal Tractors	0.78	827

F1  
 Air Emissions Calculations  
 Tintina Montana Inc. Black Butte Copper Project  
 Road Dust Fugitive Emissions

Road Dust, Mine Operating Year 0 to 1

Non-Criteria Pollutant Emission Limits

opacity	<20%
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Process Information

Silt content of road:	4.8% (sand & gravel plant road)
Days with ppt>0.01" *	88 days
	57.5 tons, mean vehicle wt.
	226.3 VMT/day
Dust suppression control efficiency:	50% % control
	24 hr/d
	365 day/year
	2000 lb/ton

See "Road dust design values" worksheet  
 See "Road dust design values" worksheet

VMT calculations are based on 365 days per year in "Road dust design values" worksheet

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	7.39	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	69.7	1,673	305.4	20% opacity	34.86	836.70	152.70	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>10</sub>	1.89	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	17.8	427	77.8	20% opacity	8.89	213.28	38.92	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>2.5</sub>	0.19	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	1.8	42.7	7.8	20% opacity	0.89	21.36	3.90	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308

Emission Factor =  $(k)(s/12)^a(W/3)^b(365-P)/365$  lb/vmt AP-42 Ch 13.2.2 Eqns 1a and 2  
 for travel on unpaved surfaces at industrial sites

where:

k = particle size multiplier

= 4.9 for PM (>30 µg/m<sup>3</sup>)

= 1.5 for PM<sub>10</sub>

= 0.15 for PM<sub>2.5</sub>

a = empirical constant

= 0.7 for PM (>30 µg/m<sup>3</sup>)

= 0.9 for PM<sub>10</sub> and PM<sub>2.5</sub>

b = 0.45 for all PM

s = 4.8 surface material silt content, per AP42-Table 13.2.2-1, mean for sand and gravel processing plant road

W = 57.5 tons, mean vehicle weight

P = 88 number of days in year with at least 0.01 inches of precipitation per on-site met station - year 2013 data used as it showed the fewest days with sufficient precipitation

Table 13.2.2-4 Emission Factor for 1980's Vehicle Fleet Exhaust, Brake Wear and Tire Wear

PM 0.00047 lb/vmt

PM<sub>10</sub> 0.00047 lb/vmt

PM<sub>2.5</sub> 0.00036 lb/vmt

Emission Factor Calculations:	Road dust:	Equipment wear:	Total Particulate EF:
PM Emission factor =	7.39 lb/vmt +	0.00047 lb/vmt =	7.39 lb/vmt
PM <sub>10</sub> Emission factor =	1.88 lb/vmt +	0.00047 lb/vmt =	1.89 lb/vmt
PM <sub>2.5</sub> Emission factor =	0.19 lb/vmt +	0.00036 lb/vmt =	0.19 lb/vmt



F2  
 Air Emissions Calculations  
 Tintina Montana Inc. Black Butte Copper Project  
 Road Dust Fugitive Emissions

Road Dust, Mine Operating Year 1 to 2

Non-Criteria Pollutant Emission Limits

opacity	<20%
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Process Information

Silt content of road:	4.8% (sand & gravel plant road)
Days with ppt>0.01" *	88 days
	57.5 tons, mean vehicle wt.
	83.6 VMT/day
Dust suppression control efficiency:	50% control
	24 hr/d
	365 day/year
	2000 lb/ton

See "Road dust design values" worksheet  
 See "Road dust design values" worksheet

VMT calculations are based on 365 days per year in "Road dust design values" worksheet

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	7.39	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	25.8	618	112.8	20% opacity	12.9	309	56.4	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>10</sub>	1.89	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	6.6	158	28.8	20% opacity	3.3	78.8	14.4	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>2.5</sub>	0.19	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	0.7	15.8	2.9	20% opacity	0.33	7.9	1.44	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308

Emission Factor =  $(k)(s/12)^a(W/3)^b(365-P)/365$  lb/vmt  
 for travel on unpaved surfaces at industrial sites

AP-42 Ch 13.2.2 Eqns 1a and 2

where:

k = particle size multiplier

- = 4.9 for PM (>30 µg/m<sup>3</sup>)
- = 1.5 for PM<sub>10</sub>
- = 0.15 for PM<sub>2.5</sub>

a = empirical constant

- = 0.7 for PM (>30 µg/m<sup>3</sup>)
- = 0.9 for PM<sub>10</sub> and PM<sub>2.5</sub>

b = 0.45 for all PM

s = 4.8 surface material silt content, per AP42-Table 13.2.2-1, mean for sand and gravel processing plant road

W = 57 tons, mean vehicle weight

P = 88 number of days in year with at least 0.01 inches of precipitation per on-site met station - year 2013 data used as it showed the fewest days with sufficient precipitation

Table 13.2.2-4 Emission Factor for 1980's Vehicle Fleet Exhaust, Brake Wear and Tire Wear

PM	0.00047 lb/vmt
PM <sub>10</sub>	0.00047 lb/vmt
PM <sub>2.5</sub>	0.00036 lb/vmt

Emission Factor Calculations:	Road dust:	Equipment wear:	Total Particulate EF:
PM Emission factor =	7.39 lb/vmt +	0.00047 lb/vmt =	7.39 lb/vmt
PM <sub>10</sub> Emission factor =	1.88 lb/vmt +	0.00047 lb/vmt =	1.89 lb/vmt
PM <sub>2.5</sub> Emission factor =	0.19 lb/vmt +	0.00036 lb/vmt =	0.19 lb/vmt

F3  
 Air Emissions Calculations  
 Tintina Montana Inc. Black Butte Copper Project  
 Road Dust Fugitive Emissions

Road Dust, Mine Operating Year 2 to 15, annual average

Non-Criteria Pollutant Emission Limits

opacity	<20%
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Process Information

Silt content of road:	4.8 % (sand & gravel plant road)
Days with ppt>0.01" *	88 days
	57.5 tons, mean vehicle wt.
	421.8 VMT/day/years 2 thru 15, inclusive
	16 number of years
	26.4 VMT/day, annual average
Dust suppression control efficiency:	50% % control
	24 hr/d
	365 day/year
	2000 lb/ton

See "Road dust design values" worksheet

See "Road dust design values" worksheet

VMT calculations are based on 365 days per year in "Road dust design values" worksheet

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	7.39	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	8.1	195	35.6	20% opacity	4.1	97.5	17.8	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>10</sub>	1.89	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	2.1	49.7	9.1	20% opacity	1.0	24.8	4.5	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>2.5</sub>	0.19	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	0.21	5.0	0.91	20% opacity	0.10	2.5	0.45	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308

Emission Factor =  $(k)(s/12)^a(W/3)^b(365-P)/365$  lb/vmt for travel on unpaved surfaces at industrial sites AP-42 Ch 13.2.2.2 Eqns 1a and 2

where:

k = particle size multiplier

= 4.9 for PM (>30 µg/m<sup>3</sup>)

= 1.5 for PM<sub>10</sub>

= 0.15 for PM<sub>2.5</sub>

a = empirical constant

= 0.7 for PM (>30 µg/m<sup>3</sup>)

= 0.9 for PM<sub>10</sub> and PM<sub>2.5</sub>

b = 0.45 for all PM

s = 4.8 surface material silt content, per AP42-Table 13.2.2-1, mean for sand and gravel processing plant road

W = 57 tons, mean vehicle weight

P = 88 number of days in year with at least 0.01 inches of precipitation per on-site met station - year 2013 data used as it showed the fewest days with sufficient precipitation

Table 13.2.2-4 Emission Factor for 1980's Vehicle Fleet Exhaust, Brake Wear and Tire Wear

PM 0.00047 lb/vmt

PM<sub>10</sub> 0.00047 lb/vmt

PM<sub>2.5</sub> 0.00036 lb/vmt

Emission Factor Calculations:	Road dust:	Equipment wear:	Total Particulate EF:
PM Emission factor =	7.39 lb/vmt +	0.00047 lb/vmt =	7.39 lb/vmt
PM <sub>10</sub> Emission factor =	1.89 lb/vmt +	0.00047 lb/vmt =	1.89 lb/vmt
PM <sub>2.5</sub> Emission factor =	0.19 lb/vmt +	0.00036 lb/vmt =	0.19 lb/vmt

F4  
 Air Emissions Calculations  
 Tintina Montana Inc. Black Butte Copper Project  
 Road Dust Fugitive Emissions

Road Dust, Mine Operating Years 16 and 17, annual average

Non-Criteria Pollutant Emission Limits

opacity	<20%
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Process Information

Silt content of road:	4.8 % (sand & gravel plant road)
Days with ppt>0.01" *	88 days
	57.5 tons, mean vehicle wt.
	218.8 VMT/day/years 16 thru 17, inclusive
	2 number of years
	109.4 VMT/day, annual average
Dust suppression control efficiency:	50% % control
	24 hr/d
	365 day/year
	2000 lb/ton

See "Road dust design values" worksheet

See "Road dust design values" worksheet

VMT calculations are based on 365 days per year in "Road dust design values" worksheet

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	7.39	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	33.7	809	147.6	20% opacity	16.9	404.4	73.8	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>10</sub>	1.89	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	8.6	206.2	37.6	20% opacity	4.3	103.1	18.8	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>2.5</sub>	0.19	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	0.86	20.7	3.77	20% opacity	0.43	10.3	1.88	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308

Emission Factor =  $(k)(s/12)^a(W/3)^b(365-P)/365$  lb/vmt for travel on unpaved surfaces at industrial sites AP-42 Ch 13.2.2 Eqns 1a and 2

where:

k = particle size multiplier

= 4.9 for PM (>30 µg/m<sup>3</sup>)

= 1.5 for PM<sub>10</sub>

= 0.15 for PM<sub>2.5</sub>

a = empirical constant

= 0.7 for PM (>30 µg/m<sup>3</sup>)

= 0.9 for PM<sub>10</sub> and PM<sub>2.5</sub>

b = 0.45 for all PM

s = 4.8 surface material silt content, per AP42-Table 13.2.2-1, mean for sand and gravel processing plant road

W = 57 tons, mean vehicle weight

P = 88 number of days in year with at least 0.01 inches of precipitation per on-site met station - year 2013 data used as it showed the fewest days with sufficient precipitation

Table 13.2.2-4 Emission Factor for 1980's Vehicle Fleet Exhaust, Brake Wear and Tire Wear

PM 0.00047 lb/vmt

PM<sub>10</sub> 0.00047 lb/vmt

PM<sub>2.5</sub> 0.00036 lb/vmt

Emission Factor Calculations:	Road dust:	Equipment wear:	Total Particulate EF:
PM Emission factor =	7.39 lb/vmt +	0.00047 lb/vmt =	7.39 lb/vmt
PM <sub>10</sub> Emission factor =	1.89 lb/vmt +	0.00047 lb/vmt =	1.89 lb/vmt
PM <sub>2.5</sub> Emission factor =	0.19 lb/vmt +	0.00036 lb/vmt =	0.19 lb/vmt

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Air Emissions Calculations  
Tintina Montana Inc. Black Butte Copper Project  
Road Dust Fugitive Emissions

Road Dust, Mine Operating Year 18

Non-Criteria Pollutant Emission Limits

opacity	<20%
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Process Information

Silt content of road:	4.8% (sand & gravel plant road)
Days with ppt>0.01" *	88 days
	57.5 tons, mean vehicle wt.
	17.3 VMT/day
Dust suppression control efficiency:	50% control
	24 hr/d
	365 day/year
	2000 lb/ton

See "Road dust design values" worksheet  
See "Road dust design values" worksheet

VMT calculations are based on 365 days per year in "Road dust design values" worksheet

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	7.39	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	5.3	128	23.4	20% opacity	2.7	64.0	11.7	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>10</sub>	1.89	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	1.4	32.6	6.0	20% opacity	0.68	16.3	3.0	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>2.5</sub>	0.19	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	0.14	3.3	0.60	20% opacity	0.07	1.6	0.30	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308

Emission Factor =  $(k)(s/12)^a(W/3)^b(365-P)/365$  lb/vmt for travel on unpaved surfaces at industrial sites  
AP-42 Ch 13.2.2 Eqns 1a and 2

where:

k = particle size multiplier

= 4.9 for PM (>30 µg/m<sup>3</sup>)

= 1.5 for PM<sub>10</sub>

= 0.15 for PM<sub>2.5</sub>

a = empirical constant

= 0.7 for PM (>30 µg/m<sup>3</sup>)

= 0.9 for PM<sub>10</sub> and PM<sub>2.5</sub>

b = 0.45 for all PM

s = 4.8 surface material silt content, per AP42-Table 13.2.2-1, mean for sand and gravel processing plant road

W = 57 tons, mean vehicle weight

P = 88 number of days in year with at least 0.01 inches of precipitation per on-site met station - year 2013 data used as it showed the fewest days with sufficient precipitation

Table 13.2.2-4 Emission Factor for 1980's Vehicle Fleet Exhaust, Brake Wear and Tire Wear

PM 0.00047 lb/vmt

PM<sub>10</sub> 0.00047 lb/vmt

PM<sub>2.5</sub> 0.00036 lb/vmt

Emission Factor Calculations:	Road dust:	Equipment wear:	Total Particulate EF:
PM Emission factor =	7.39 lb/vmt +	0.00047 lb/vmt =	7.39 lb/vmt
PM <sub>10</sub> Emission factor =	1.88 lb/vmt +	0.00047 lb/vmt =	1.89 lb/vmt
PM <sub>2.5</sub> Emission factor =	0.19 lb/vmt +	0.00036 lb/vmt =	0.19 lb/vmt

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**Air Emissions Calculations**

**Tintina Montana Inc. Black Butte Copper Project**

**Material to Temporary Construction Stockpile**

Material handling and transfer to the Temporary Construction Stockpile. Material will be used to construct embankments around the Portal Pad, Process Water Pond, and Non-Contact Water Pond. This activity occurs in year 0 - 1.5, and includes material scraping, loading, and dumping.

**Process Information**

Process Rate:	497,799	tons/ 1.5 yr
Process Rate:	387,466	tons/yr
Operating Time:	365	days/yr
Operating Time:	12	hr/day
Process Rate:	88.46	tons/hr
Number of Transfers:	2	load + dump

Note (1)

per hour -- 12 total/day

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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(1) Adjusted annual rate: Material from CTF -- Year 1-1.5 is half the process rate of Year 0-1. See Model Emission Calcs at bottom of page

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	see below - 11.792 lb/hr and 0.00252 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	1.43	17.15	3.13	20% opacity	1.43	17.15	3.13	None		ARM 17.8.308
PM <sub>10</sub>	see below - 2.451 lb/hr and 0.00119 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.42	4.99	0.91	20% opacity	0.42	4.99	0.91	None		ARM 17.8.308

PM <sub>2.5</sub>	see below - 1.238 lb/hr and 0.00018 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.14	1.62	0.30	20% opacity	0.14	1.62	0.30	None	ARM 17.8.308
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Assume: Topsoil and subsoil stripping is equivalent to bulldozing overburden in Table 11.9-1 per Table 13.2.3-1

Assume: PM = TSP where no other PM data are available

Assume: Each ton of material moved goes through two drops - one into a truck, and one into a pile.

**Uncontrolled Emissions Calculations:**

$$PM = (3.13 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00252 \text{ lb/ton}) * (88 \text{ tons/hr}) * (2 \text{ drops}) = 1.43 \text{ lb/hr}$$

$$PM = (1.43 \text{ lb/hr}) * (12 \text{ hr/day}) = 17.15 \text{ lb/day}$$

$$PM = (0.011 \text{ lb PM / ton}) * (387466 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00252 \text{ lb/ton}) * (387,466 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 3.13 \text{ tpy}$$

$$PM_{10} = (0.91 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00119 \text{ lb/ton}) * (88 \text{ tons/hr}) * (2 \text{ drops}) = 0.42 \text{ lb/hr}$$

$$PM_{10} = (0.42 \text{ lb/hr}) * (12 \text{ hr/day}) = 4.99 \text{ lb/day}$$

$$PM_{10} = (0.002 \text{ lb PM}_{10} / \text{ton}) * (387466 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00119 \text{ lb/ton}) * (387,466 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.91 \text{ tpy}$$

$$PM_{2.5} = (0.30 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00018 \text{ lb/ton}) * (88 \text{ tons/hr}) * (2 \text{ drops}) = 0.14 \text{ lb/hr}$$

$$PM_{2.5} = (0.14 \text{ lb/hr}) * (12 \text{ hr/day}) = 1.62 \text{ lb/day}$$

$$PM_{2.5} = (0.001 \text{ lb PM}_{2.5} / \text{ton}) * (387466 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00018 \text{ lb/ton}) * (387,466 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.30 \text{ tpy}$$

**PM Emission Factor Calculations:**

$$EF_{PM_{10}/PM_{2.5}} = EF \text{ for topsoil removal (bulldozing of overburden, Table 11.9-1)} + 2 * EF \text{ for truck load and dump of material (Section 13.2.4)}$$

$$\text{silt \%}, s = 6.9 \quad (\text{Table 11.9-3, bulldozing overburden}) - \text{this value was used instead of the road silt value for a more conservative estimate}$$

$$\text{Moisture \%}, M = 3.4 \quad (\text{Table 13.2.4-1, Western surface coal mining exposed ground mean moisture content})$$

Emission factor calculations for topsoil removal:

Table 11.9-1 provides equations to calculate EF in terms of lb/hr for TSP and PM<sub>15</sub>, with a scaling factor for PM<sub>10</sub> as a function of PM<sub>15</sub>.

$$\text{Topsoil removal } EF_{PM} = EF_{TSP} \text{ for topsoil removal by bulldozing (Table 11.9-1 for overburden bulldozing)} = 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM} = 11.792 \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM_{10}} = 0.75 * EF_{PM_{15}} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.75 * 1.0 * (s)^{1.5} / (M)^{1.4} \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM_{10}} = 2.451 \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM_{2.5}} = 0.105 * EF_{TSP} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.105 * 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM_{2.5}} = 1.238 \text{ lb/hr}$$

**Dozer clearing rate**

Klanfar et al. 2014

535 m<sup>3</sup>/hr (Avg.)

**Bulk Density**

Engineering Toolbox

Soil, High 1600 kg/m<sup>3</sup>

Soil, Low 1200 kg/m<sup>3</sup>

Clay, High 2600 kg/m<sup>3</sup>

Clay, Low 1800 kg/m<sup>3</sup>

**Conversions**

907.185 kg/ton

12 hrs/day

4380 hrs/yr

**Average**

**1800 kg/m<sup>3</sup>**

$$\text{Topsoil removal } EF_{PM} = EF_{PM} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 11.792 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal  $EF_{PM}$  = 0.01111 lb PM / ton**

Topsoil removal  $EF_{PM10}$  =  $EF_{PM10 (lb/hr)} * (1/Dozer\ clearing\ rate) * (1/Avg.\ Bulk\ Density) * (907.185\ kg/ton) = 2.451\ lb/hr * (hr/535\ m^3) * (m^3/1800\ kg) * (907.185\ kg/ton)$

**Topsoil removal  $EF_{PM10}$  = 0.00231 lb PM10 / ton**

Topsoil removal  $EF_{PM2.5}$  =  $EF_{PM2.5 (lb/hr)} * (1/Dozer\ clearing\ rate) * (1/Avg.\ Bulk\ Density) * (907.185\ kg/ton) = 1.238\ lb/hr * (hr/535\ m^3) * (m^3/1800\ kg) * (907.185\ kg/ton)$

**Topsoil removal  $EF_{PM2.5}$  = 0.00117 lb PM2.5 / ton**

Emission factor calculations for truck loading and dumping (section 13.2.4)

$$E = k * (0.0032) * (U/5)^{1.3} / (M/2)^{1.4} \text{ lb/ton}$$

Equation (1), section 13.2.4, emission factor for drop operations

k = 0.74 < 30 um PM  
0.35 < 10 um PM  
0.053 < 2.5 um PM  
U = 9.3 mean windspeed, mph (standard windspeed for MT per MDEQ)  
M = 3.4 material moisture content, %

**Truck load and dump  $EF_{PM}$  = 0.00252 lb/ton**

**Truck load and dump  $EF_{PM10}$  = 0.00119 lb/ton**

**Truck load and dump  $EF_{PM2.5}$  = 0.00018 lb/ton**

F7

**Air Emissions Calculations**

**Tintina Montana Inc. Black Butte Copper Project**  
**Temporary construction stockpile (Table 3-13, 3.4.1)**

**Operations**

12 hr/day  
 365 days/year  
 1 material pile disturbances/hr  
 27 disturbances/day (max number of truck trips)  
 36 m<sup>2</sup>, disturbance area  
 0.01 acre, disturbance area  
 20 ft, max pile height  
 unknown ft, length  
 unknown ft, width  
 50% dust control efficiency by water spray as needed

**Conversions**

43,560 ft<sup>2</sup> / acre  
 0.3048 m / ft  
 453.593 g / lb  
 2000 lb / ton

**Data Sets Used to Estimate Emissions**

Meteorological data was collected near the proposed minesite from mid-2012 through 4th quarter 2017.  
 Year 2013 maximum 1-hour average windspeed recorded per day was used for these calculations because the highest hourly windspeed was recorded that year (Table 1 below).  
 Year 2016 maximum 1-hour average windspeed recorded per day was used for these calculations because it is the most recent complete year of data available for the site (Table 2 below).  
 Table 3 below compares the daily erosion potential (P) between the 2013 and 2016 calculated erosion potential and lists the highest of the two values as an estimate of wind erosion for that day.

**Assumptions:**

Assumes flat pile, such that the height to base ratio is less than 0.2:  
 height to base (shortest length) ratio:

Fastest mile of wind,  $u_{10}^*$  = 1.35 \* annual maximum 1-hour average wind speed (assumption based on industry convention and a conservative approach - see Wind Conv. (2) worksheet)  
 Friction velocity,  $u^*$  = 0.053 \*  $u_{10}^*$  (Eqn. 4 from AP-42 Ch. 13.2.5)

Threshold friction velocity,  $u_t^*$  = 1.02 m/s excess reclamation storage (assume surface simliar to overburden from Table 13.2.5-2)

N = 4,380 number of disturbances per year  
 36 m<sup>2</sup>/disturbance

**Emissions Potential Calculations:**

$P = [58 (u^* - u_t^*)^2 + 25 (u^* - u_t^*)]$  Eq. 3 from AP-42 Ch. 13.2.5-5

Where:

P = erosion potential, g/m<sup>2</sup>/disturbance event - P is calculated for each calendar day (as P\_daily) in year 2013 (Table 1) and year 2016 (Table 2). Table 3 lists the largest P\_daily calculated for that calendar day between Tables 1 and 2.  
 $u^*$  = friction velocity, m/s - maximum daily 1-hour average wind speeds for year 2013 and year 2016 were used to determine  $u^*$  for each day of the year according to assumptions listed above  
 $u_t^*$  = 1.02 threshold friction velocity for pile, m/s (overburden, Table 13.2.5-2)

$P_{\text{annual}} [g / (m^2 \cdot \text{year})] = \frac{\text{day 365}}{n = \text{day 1}} P_{\text{daily}} [g / (m^2 \cdot \text{event})] * 26.5387671232877 \text{ hr/day} * 1 \text{ events/} 104.12 \text{ g} / (m^2 \cdot \text{year})$  (from the bottom of Table 3 below)

**Emissions Calculations:**

$ER = P_{\text{annual}} * A * c * k$

Where:

ER = emission rate for each pollutant, ton/yr

$P_{\text{annual}} = 104.12 \text{ g} / (m^2 \cdot \text{year})$  - emission potential for a conservatively worst case year (see above)  
 0.230 lb / (m<sup>2</sup>·year)  
 1.15E-04 ton / (m<sup>2</sup>·year)  
 A = 36 m<sup>2</sup> - disturbance area  
 c = 50% control efficiency (assumed)  
 k = 1.0 PM particle size multiplier, pg. 13.2.5-3: PM = 1.0, PM10 = 0.5, PM2.5 = 0.075  
 0.075 PM2.5

**Results:**

TSP, tpy	2.07E-03
PM10, tpy	1.03E-03
PM2.5, tpy	1.55E-04

F7 [Wind](#)  
 Temp Const Pile



F8

**Air Emissions Calculations**

**Tintina Montana Inc. Black Butte Copper Project**

**Embankment Construction - Material Handling Emissions**

Material handling and transfer to construct embankments around the Portal Pad, Process Water Pond, and Non-Contact Water Pond as part of mine development  
This activity occurs in year 0 - 1.5, and includes material scraping, loading, and dumping.

Process Information		
Process Rate:	497,799	tons/ 1.5 yr
Process Rate:	387,466	tons/yr
Operating Time:	365	days/yr
Operating Time:	12	hr/day
Process Rate:	88.46	tons/hr
Number of Transfers:	2	load + dump

Note (1)

Non-Criteria Pollutant Emission Limits	
opacity	<20%

(1) Adjusted annual rate: Material from CTF -- Year 1-1.5 is half the process rate of Year 0-1. See Model Emission Calcs at bottom of page

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	see below - 11.792 lb/hr and 0.00252 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	1.43	17.15	3.13	20% opacity	1.43	17.15	3.13	None		ARM 17.8.308
PM <sub>10</sub>	see below - 2.451 lb/hr and 0.00119 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.42	4.99	0.91	20% opacity	0.42	4.99	0.91	None		ARM 17.8.308
PM <sub>2.5</sub>	see below - 1.238 lb/hr and 0.00018 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.14	1.62	0.30	20% opacity	0.14	1.62	0.30	None		ARM 17.8.308

Assume: Topsoil and subsoil stripping is equivalent to bulldozing overburden in Table 11.9-1 per Table 13.2.3-1

Assume: PM = TSP where no other PM data are available

Assume: Each ton of material moved goes through two drops - one into a truck, and one into a pile.

**Uncontrolled Emissions Calculations:**

$$PM = (3.13 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00252 \text{ lb/ton}) * (88 \text{ tons/hr}) * (2 \text{ drops}) = 1.43 \text{ lb/hr}$$

$$PM = (1.43 \text{ lb/hr}) * (12 \text{ hr/day}) = 17.15 \text{ lb/day}$$

$$PM = (0.011 \text{ lb PM / ton}) * (387466 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00252 \text{ lb/ton}) * (387,466 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 3.13 \text{ tpy}$$

$$PM_{10} = (0.91 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00119 \text{ lb/ton}) * (88 \text{ tons/hr}) * (2 \text{ drops}) = 0.42 \text{ lb/hr}$$

$$PM_{10} = (0.42 \text{ lb/hr}) * (12 \text{ hr/day}) = 4.99 \text{ lb/day}$$

$$PM_{10} = (0.002 \text{ lb PM}_{10} / \text{ton}) * (387466 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00119 \text{ lb/ton}) * (387,466 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.91 \text{ tpy}$$

$$PM_{2.5} = (0.30 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00018 \text{ lb/ton}) * (88 \text{ tons/hr}) * (2 \text{ drops}) = 0.14 \text{ lb/hr}$$

$$PM_{2.5} = (0.14 \text{ lb/hr}) * (12 \text{ hr/day}) = 1.62 \text{ lb/day}$$

$$PM_{2.5} = (0.001 \text{ lb PM}_{2.5} / \text{ton}) * (387466 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00018 \text{ lb/ton}) * (387,466 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.30 \text{ tpy}$$

**PM Emission Factor Calculations:**

$$EF_{PM_{PM10}/PM_{2.5}} = EF \text{ for topsoil removal (bulldozing of overburden, Table 11.9-1)} + 2 * EF \text{ for truck load and dump of material (Section 13.2.4)}$$

silt %, s = 6.9 (Table 11.9-3, bulldozing overburden) - this value was used instead of the road silt value for a more conservative estimate  
 Moisture %, M = 3.4 (Table 13.2.4-1, Western surface coal mining exposed ground mean moisture content)

**Emission factor calculations for topsoil removal:**

Table 11.9-1 provides equations to calculate EF in terms of lb/hr for TSP and PM<sub>15</sub>, with a scaling factor for PM<sub>10</sub> as a function of PM<sub>15</sub>.

$$\text{Topsoil removal } EF_{PM} = EF_{TSP} \text{ for topsoil removal by bulldozing (Table 11.9-1 for overburden bulldozing)} = 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM} = 11.792 \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM10} = 0.75 * EF_{PM15} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.75 * 1.0 * (s)^{1.5} / (M)^{1.4} \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM10} = 2.451 \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM2.5} = 0.105 * EF_{TSP} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.105 * 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM2.5} = 1.238 \text{ lb/hr}$$

Dozer clearing rate	Bulk Density
<i>Klanfar et al. 2014</i>	<i>Engineering Toolbox</i>
535 m <sup>3</sup> /hr (Avg.)	Soil, High 1600 kg/m <sup>3</sup>
	Soil, Low 1200 kg/m <sup>3</sup>
<b>Conversions</b>	Clay, High 2600 kg/m <sup>3</sup>
907.185 kg/ton	Clay, Low 1800 kg/m <sup>3</sup>
12 hrs/day	<b>Average 1800 kg/m<sup>3</sup></b>
4380 hrs/yr	

$$\text{Topsoil removal } EF_{PM} = EF_{PM} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 11.792 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

$$\text{Topsoil removal } EF_{PM} = 0.01111 \text{ lb PM / ton}$$

$$\text{Topsoil removal } EF_{PM10} = EF_{PM10} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 2.451 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

$$\text{Topsoil removal } EF_{PM10} = 0.00231 \text{ lb PM}_{10} / \text{ton}$$

$$\text{Topsoil removal } EF_{PM2.5} = EF_{PM2.5} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 1.238 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

$$\text{Topsoil removal } EF_{PM2.5} = 0.00117 \text{ lb PM}_{2.5} / \text{ton}$$

**Emission factor calculations for truck loading and dumping (section 13.2.4)**

$$E = k * (0.0032) * (U/5)^{1.3} / (M/2)^{1.4} \text{ lb/ton}$$

Equation (1), section 13.2.4, emission factor for drop operations

$$k = 0.74 < 30 \text{ um PM}$$

0.35 < 10 um PM  
0.053 < 2.5 um PM  
U = 9.3 mean windspeed, mph (standard windspeed for MT per MDEQ)  
M = 3.4 material moisture content, %

**Truck load and dump  $EF_{PM}$  = 0.00252 lb/ton**  
**Truck load and dump  $EF_{PM10}$  = 0.00119 lb/ton**  
**Truck load and dump  $EF_{PM2.5}$  = 0.00018 lb/ton**

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**Air Emissions Calculations**

**Tintina Montana Inc. Black Butte Copper Project**

**NWCR Embankment Material Return to CTF Area**

Material handling and transfer to construct embankments around the Portal Pad, Process Water Pond, and Non-Contact Water Pond as part of mine development

This activity occurs in years 16-18, and includes material scraping, loading, and dumping.

**Process Information**

Process Rate:	220,666	tons/yr-year 16, maximum annual rate
Operating Time:	365	days/yr
Operating Time:	12	hr/day
Process Rate:	50.38	tons/hr
Number of Transfers:	2	load + dump

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	see below - 11.792 lb/hr and 0.00252 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.81	9.77	1.78	20% opacity	0.81	9.77	1.78	None		ARM 17.8.308
PM <sub>10</sub>	see below - 2.451 lb/hr and 0.00119 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.24	2.84	0.52	20% opacity	0.24	2.84	0.52	None		ARM 17.8.308

PM <sub>2.5</sub>	see below - 1.238 lb/hr and 0.00018 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.08	0.92	0.17	20% opacity	0.08	0.92	0.17	None	ARM 17.8.308
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Assume: Material working is equivalent to bulldozing overburden in Table 11.9-1 per Table 13.2.3-1

Assume: PM = TSP where no other PM data are available

Assume: Each ton of material moved goes through two drops - one into a truck, and one into a pile.

**Uncontrolled Emissions Calculations:**

$PM = (1.78 \text{ tons/yr-year 16, maximum annual rate}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00252 \text{ lb/ton}) * (50 \text{ tons/hr}) * (2 \text{ drops}) = 0.81 \text{ lb/hr}$   
 $PM = (0.81 \text{ lb/hr}) * (12 \text{ hr/day}) = 9.77 \text{ lb/day}$   
 $PM = (0.011 \text{ lb PM / ton}) * (220666 \text{ tons/yr-year 16, maximum annual rate}) / [2,000 \text{ lb/ton}] + (0.00252 \text{ lb/ton}) * (220,666 \text{ tons/yr-year 16, maximum annual rate}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 1.78 \text{ tpy}$   
 $PM_{10} = (0.52 \text{ tons/yr-year 16, maximum annual rate}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00000) * (50 \text{ tons/hr}) * (2 \text{ drops}) = 0.24 \text{ lb/hr}$   
 $PM_{10} = (0.24 \text{ lb/hr}) * (12 \text{ hr/day}) = 2.84 \text{ lb/day}$   
 $PM_{10} = (0.002 \text{ lb PM}_{10} / \text{ton}) * (220666 \text{ tons/yr-year 16, maximum annual rate}) / [2,000 \text{ lb/ton}] + (0.00000) * (220,666 \text{ tons/yr-year 16, maximum annual rate}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.52 \text{ tpy}$   
 $PM_{2.5} = (0.17 \text{ tons/yr-year 16, maximum annual rate}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00000) * (50 \text{ tons/hr}) * (2 \text{ drops}) = 0.08 \text{ lb/hr}$   
 $PM_{2.5} = (0.08 \text{ lb/hr}) * (12 \text{ hr/day}) = 0.92 \text{ lb/day}$   
 $PM_{2.5} = (0.001 \text{ lb PM}_{2.5} / \text{ton}) * (220666 \text{ tons/yr-year 16, maximum annual rate}) / [2,000 \text{ lb/ton}] + (0.00000) * (220,666 \text{ tons/yr-year 16, maximum annual rate}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.17 \text{ tpy}$

**PM Emission Factor Calculations:**

$EF_{PM_{10}/PM_{10}/PM_{2.5}} = EF \text{ for topsoil removal (bulldozing of overburden, Table 11.9-1)} + 2 * EF \text{ for truck load and dump of material (Section 13.2.4)}$

silt %, s = 6.9 (Table 11.9-3, bulldozing overburden) - this value was used instead of the road silt value for a more conservative estimate  
 Moisture %, M = 3.4 (Table 13.2.4-1, Western surface coal mining exposed ground mean moisture content)

Emission factor calculations for topsoil removal:

Table 11.9-1 provides equations to calculate EF in terms of lb/hr for TSP and PM<sub>15</sub>, with a scaling factor for PM<sub>10</sub> as a function of PM<sub>15</sub>.

Topsoil removal  $EF_{PM} = EF_{TSP}$  for topsoil removal by bulldozing (Table 11.9-1 for overburden bulldozing) =  $5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$   
 Topsoil removal  $EF_{PM} = 11.792 \text{ lb/hr}$

Topsoil removal  $EF_{PM_{10}} = 0.75 * EF_{PM_{15}}$  (Table 11.9-1 for overburden bulldozing) =  $0.75 * 1.0 * (s)^{1.5} / (M)^{1.4}$   
 Topsoil removal  $EF_{PM_{10}} = 2.451 \text{ lb/hr}$

Topsoil removal  $EF_{PM_{2.5}} = 0.105 * EF_{TSP}$  (Table 11.9-1 for overburden bulldozing) =  $0.105 * 5.7 * (s)^{1.2} / (M)^{1.3}$   
 Topsoil removal  $EF_{PM_{2.5}} = 1.238 \text{ lb/hr}$

**Dozer clearing rate**

*Klanfar et al. 2014*

535 m<sup>3</sup>/hr (Avg.)

**Bulk Density**

*Engineering Toolbox*

Soil, High 1600 kg/m<sup>3</sup>

Soil, Low 1200 kg/m<sup>3</sup>

Clay, High 2600 kg/m<sup>3</sup>

Clay, Low 1800 kg/m<sup>3</sup>

**Average 1800 kg/m<sup>3</sup>**

**Conversions**

907.185 kg/ton

12 hrs/day

4380 hrs/yr

$$\text{Topsoil removal EF}_{\text{PM}} = \text{EF}_{\text{PM}} (\text{lb/hr}) * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 11.792 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM</sub> = 0.01111 lb PM / ton**

$$\text{Topsoil removal EF}_{\text{PM10}} = \text{EF}_{\text{PM10}} (\text{lb/hr}) * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 2.451 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM10</sub> = 0.00231 lb PM10 / ton**

$$\text{Topsoil removal EF}_{\text{PM2.5}} = \text{EF}_{\text{PM2.5}} (\text{lb/hr}) * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 1.238 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM2.5</sub> = 0.00117 lb PM2.5 / ton**

Emission factor calculations for truck loading and dumping (section 13.2.4)

$$E = k * (0.0032) * (U/5)^{1.3} / (M/2)^{1.4} \text{ lb/ton}$$

Equation (1), section 13.2.4, emission factor for drop operations

- k = 0.74 < 30 um PM
- 0.35 < 10 um PM
- 0.053 < 2.5 um PM
- U = 9.3 mean windspeed, mph (standard windspeed for MT per MDEQ)
- M = 3.4 material moisture content, %

**Truck load and dump EF<sub>PM</sub> = 0.00252 lb/ton**

**Truck load and dump EF<sub>PM10</sub> = 0.00119 lb/ton**

**Truck load and dump EF<sub>PM2.5</sub> = 0.00018 lb/ton**

F10  
**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Material transfer from CTF to the S reclamation stockpile**  
 Excess material from the cement tailings facility (CTF) transferred to the south reclamation stockpile  
 This activity occurs in year 0 - 1.5.

Process Information		
Process Rate:	185,024	tons/yr
Operating Time:	365	days/yr
Operating Time:	12	hr/day
Process Rate:	42.24	tons/hr
Number of Transfers:	2	load + dump

Non-Criteria Pollutant Emission Limits	
opacity	<20%

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	see below - 11.792 lb/hr and 0.00252 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.68	8.19	1.49	20% opacity	0.68	8.19	1.49	None		ARM 17.8.308
PM <sub>10</sub>	see below - 2.451 lb/hr and 0.00119 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.20	2.38	0.43	20% opacity	0.20	2.38	0.43	None		ARM 17.8.308
PM <sub>2.5</sub>	see below - 1.238 lb/hr and 0.00018 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.06	0.77	0.14	20% opacity	0.06	0.77	0.14	None		ARM 17.8.308

Assume: Topsoil and subsoil stripping is equivalent to bulldozing overburden in Table 11.9-1 per Table 13.2.3-1

Assume: PM = TSP where no other PM data are available

Assume: Each ton of material moved goes through two drops - one into a truck, and one into a pile.

**Uncontrolled Emissions Calculations:**

$$PM = (1.49 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00252 \text{ lb/ton}) * (42 \text{ tons/hr}) * (2 \text{ drops}) = 0.68 \text{ lb/hr}$$

$$PM = (0.68 \text{ lb/hr}) * (12 \text{ hr/day}) = 8.19 \text{ lb/day}$$

$$PM = (0.011 \text{ lb PM / ton}) * (185024 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00252 \text{ lb/ton}) * (185,024 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 1.49 \text{ tpy}$$

$$PM_{10} = \text{\#REF!}$$

$PM_{10} = (0.20 \text{ lb/hr}) * (12 \text{ hr/day}) = 2.38 \text{ lb/day}$   
 $PM_{10} = \text{\#REF!}$   
 $PM_{2.5} = \text{\#REF!}$   
 $PM_{2.5} = (0.06 \text{ lb/hr}) * (12 \text{ hr/day}) = 0.77 \text{ lb/day}$   
 $PM_{2.5} = \text{\#REF!}$

**PM Emission Factor Calculations:**

$EF_{PM/PM_{10}/PM_{2.5}} = [EF \text{ for topsoil removal (bulldozing of overburden, Table 11.9-1) lb/hr * hr/year operating schedule}] + [2 * EF \text{ for truck load and dump of material (Section 13.2.4) lb/ton * ton/year process rate}]$

silt %, s = 6.9 (Table 11.9-3, bulldozing overburden) - this value was used instead of the road silt value for a more conservative estimate  
 Moisture %, M = 3.4 (Table 13.2.4-1, Western surface coal mining exposed ground mean moisture content)

Emission factor calculations for topsoil removal:

Table 11.9-1 provides equations to calculate EF in terms of lb/hr for TSP and  $PM_{15}$ , with a scaling factor for  $PM_{10}$  as a function of  $PM_{15}$ .

Topsoil removal  $EF_{PM} = EF_{TSP}$  for topsoil removal by bulldozing (Table 11.9-1 for overburden bulldozing) =  $5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$   
 Topsoil removal  $EF_{PM} = 11.792 \text{ lb/hr}$   
 Topsoil removal  $EF_{PM_{10}} = 0.75 * EF_{PM_{15}}$  (Table 11.9-1 for overburden bulldozing) =  $0.75 * 1.0 * (s)^{1.5} / (M)^{1.4} \text{ lb/hr}$   
 Topsoil removal  $EF_{PM_{10}} = 2.451 \text{ lb/hr}$   
 Topsoil removal  $EF_{PM_{2.5}} = 0.105 * EF_{TSP}$  (Table 11.9-1 for overburden bulldozing) =  $0.105 * 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$   
 Topsoil removal  $EF_{PM_{2.5}} = 1.238 \text{ lb/hr}$

**Dozer clearing rate**

*Klanfar et al. 2014*

535 m<sup>3</sup>/hr (Avg.)

**Bulk Density**

*Engineering Toolbox*

Soil, High 1600 kg/m<sup>3</sup>  
 Soil, Low 1200 kg/m<sup>3</sup>  
 Clay, High 2600 kg/m<sup>3</sup>  
 Clay, Low 1800 kg/m<sup>3</sup>  
**Average 1800 kg/m<sup>3</sup>**

**Conversions**

907.185 kg/ton  
 12 hrs/day  
 4380 hrs/yr

Topsoil removal  $EF_{PM} = EF_{PM \text{ (lb/hr)}} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 11.792 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$   
**Topsoil removal  $EF_{PM} = 0.01111 \text{ lb PM} / \text{ton}$**   
 Topsoil removal  $EF_{PM_{10}} = EF_{PM_{10} \text{ (lb/hr)}} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 2.451 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$   
**Topsoil removal  $EF_{PM_{10}} = 0.00231 \text{ lb PM}_{10} / \text{ton}$**   
 Topsoil removal  $EF_{PM_{2.5}} = EF_{PM_{2.5} \text{ (lb/hr)}} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 1.238 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$   
**Topsoil removal  $EF_{PM_{2.5}} = 0.00117 \text{ lb PM}_{2.5} / \text{ton}$**

Emission factor calculations for truck loading and dumping (section 13.2.4)

$E = k * (0.0032) * (U/5)^{1.3} / (M/2)^{1.4} \text{ lb/ton}$

Equation (1), section 13.2.4, emission factor for drop operations

k = 0.74 < 30 um PM  
 0.35 < 10 um PM  
 0.053 < 2.5 um PM  
 U = 9.3 mean windspeed, mph (standard windspeed for MT per MDEQ)  
 M = 3.4 material moisture content, %

**Truck load and dump  $EF_{PM} = 0.00252 \text{ lb/ton}$**   
**Truck load and dump  $EF_{PM_{10}} = 0.00119 \text{ lb/ton}$**   
**Truck load and dump  $EF_{PM_{2.5}} = 0.00018 \text{ lb/ton}$**



**F11**  
**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Excess reclamation stockpile (South) (Table 3-13, 3.4.1)**  
 Material from CTF excavation; trapezoid shape, 30 ft max height (3.6.10).

<u>Operations</u>	<u>Conversions</u>
12 hr/day	43,560 ft <sup>2</sup> / acre
365 days/year	0.3048 m / ft
1 material pile disturbances/hr	453.593 g / lb
13 disturbances/day	2000 lb / ton
36 m <sup>2</sup> , disturbance area	
0.01 acre, disturbance area	
30 ft, max pile height	
623 ft, length	
492 ft, width	
50% dust control efficiency by water spray as needed	

**Data Sets Used to Estimate Emissions**

Meteorological data was collected near the proposed minesite from mid-2012 through 4th quarter 2017.  
 Year 2013 maximum 1-hour average windspeed recorded per day was used for these calculations because the highest hourly windspeed was recorded that year (Table 1 below).  
 Year 2016 maximum 1-hour average windspeed recorded per day was used for these calculations because it is the most recent complete year of data available for the site (Table 2 below).  
 Table 3 below compares the daily erosion potential (P) between the 2013 and 2016 calculated erosion potential and lists the highest of the two values as an estimate of wind erosion for that day.

**Assumptions:**

Assumes flat pile, such that the height to base ratio is less than 0.2:  
 height to base (shortest length) ratio: 0.06

Fastest mile of wind,  $u_{10}^* = 1.35 \cdot \text{annual maximum 1-hour average wind speed}$  (assumption based on industry convention and a conservative approach - see Wind Conv. (2) worksheet)

Friction velocity,  $u^* = 0.053 \cdot u_{10}^*$  (Eqn. 4 from AP-42 Ch. 13.2.5)

Threshold friction velocity,  $u_1^* = 1.02$  m/s excess reclamation storage (assume surface simliar to overburden from Table 13.2.5-2)

$N = 4,380$  number of disturbances per year  
 36 m<sup>2</sup>/disturbance

**Emissions Potential Calculations:**

$P = [58 (u^* - u_1^*)^2 + 25 (u^* - u_1^*)]$  Eq. 3 from AP-42 Ch. 13.2.5-5

Where:

P = erosion potential, g/m<sup>2</sup>/disturbance event - P is calculated for each calendar day (as P\_daily) in year 2013 (Table 1) and year 2016 (Table 2). Table 3 lists the largest P\_daily calculated for that calendar day between Tables 1 and 2.

$u^*$  = friction velocity, m/s - maximum daily 1-hour average wind speeds for year 2013 and year 2016 were used to determine  $u^*$  for each day of the year according to assumptions listed above

$u_1^*$  = 1.02 threshold friction velocity for pile, m/s (overburden, Table 13.2.5-2)

$P_{\text{annual}} [g / (m^2 \cdot \text{year})] = \text{day } 365 \cdot P_{\text{daily}} [g / (m^2 \cdot \text{event})] \cdot 12.6728767123288 \text{ hr/day} \cdot 1 \text{ events/} 104.12 \text{ g} / (m^2 \cdot \text{year})$  (from the bottom of Table 3 below)  
 $n = \text{day } 1$

**Emissions Calculations:**

$ER = P_{\text{annual}} \cdot A \cdot c \cdot k$

Where:

ER = emission rate for each pollutant, ton/yr

$P_{\text{annual}} = 104.12$  g / (m<sup>2</sup>·year) - emission potential for a conservatively worst case year (see above)

0.230 lb / (m<sup>2</sup>·year)

1.15E-04 ton / (m<sup>2</sup>·year)

A = 36 m<sup>2</sup> - disturbance area

c = 50% control efficiency (assumed)

k = 1.0 PM particle size multiplier, pg. 13.2.5-3; PM = 1.0, PM10 = 0.5, PM2.5 = 0.075

0.5 PM10

0.075 PM2.5

**Results:**

TSP, tpy	2.07E-03
PM10, tpy	1.03E-03
PM2.5, tpy	1.55E-04

F11 Wind

F12

**Air Emissions Calculations**

**Tintina Montana Inc. Black Butte Copper Project**

**Material transfer from the S reclamation stockpile to the CTF**

Material transferred from the south reclamation stockpile to the cement tailings facility (CTF) for reclamation

This activity occurs in years 16 - 17.

**Process Information**

Process Rate:	185,024	tons/yr - year 16, maximum annual rate
Operating Time:	365	days/yr
Operating Time:	12	hr/day
Process Rate:	42.24	tons/hr
Number of Transfers:	2	load + dump

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	see below - 11.792 lb/hr and 0.00252 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.68	8.19	1.49	20% opacity	0.68	8.19	1.49	None		ARM 17.8.308
PM <sub>10</sub>	see below - 2.451 lb/hr and 0.00119 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.20	2.38	0.43	20% opacity	0.20	2.38	0.43	None		ARM 17.8.308
PM <sub>2.5</sub>	see below - 1.238 lb/hr and 0.00018 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.06	0.77	0.14	20% opacity	0.06	0.77	0.14	None		ARM 17.8.308

Assume: Returning material to the CTF is equivalent to bulldozing overburden in Table 11.9-1 per Table 13.2.3-1

Assume: PM = TSP where no other PM data are available

Assume: Each ton of material moved goes through two drops - one into a truck, and one into a pile.

**Uncontrolled Emissions Calculations:**

$$PM = (1.49 \text{ tons/yr - year 16, maximum annual rate}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00252 \text{ lb/ton}) * (42 \text{ tons/hr}) * (2 \text{ drops}) = 0.68 \text{ lb/hr}$$

$$PM = (0.68 \text{ lb/hr}) * (12 \text{ hr/day}) = 8.19 \text{ lb/day}$$

$$PM = (0.011 \text{ lb PM / ton}) * (185024 \text{ tons/yr - year 16, maximum annual rate}) / [2,000 \text{ lb/ton}] + (0.00252 \text{ lb/ton}) * (185,024 \text{ tons/yr - year 16, maximum annual rate}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 1.49 \text{ t}$$

$$PM_{10} = (0.43 \text{ tons/yr - year 16, maximum annual rate}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00000) * (42 \text{ tons/hr}) * (2 \text{ drops}) = 0.20 \text{ lb/hr}$$

$$PM_{10} = (0.20 \text{ lb/hr}) * (12 \text{ hr/day}) = 2.38 \text{ lb/day}$$

$$PM_{10} = (0.002 \text{ lb PM}_{10} / \text{ton}) * (185024 \text{ tons/yr - year 16, maximum annual rate}) / [2,000 \text{ lb/ton}] + (0.00000) * (185,024 \text{ tons/yr - year 16, maximum annual rate}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.43 \text{ tpy}$$

$$PM_{2.5} = (0.14 \text{ tons/yr - year 16, maximum annual rate}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00000) * (42 \text{ tons/hr}) * (2 \text{ drops}) = 0.06 \text{ lb/hr}$$

$$PM_{2.5} = (0.06 \text{ lb/hr}) * (12 \text{ hr/day}) = 0.77 \text{ lb/day}$$

$$PM_{2.5} = (0.001 \text{ lb PM}_{2.5} / \text{ton}) * (185024 \text{ tons/yr - year 16, maximum annual rate}) / [2,000 \text{ lb/ton}] + (0.00000) * (185,024 \text{ tons/yr - year 16, maximum annual rate}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.14 \text{ tpy}$$

**PM Emission Factor Calculations:**

$$EF_{PM_{PM_{10}/PM_{2.5}}} = [EF \text{ for topsoil removal (bulldozing of overburden, Table 11.9-1) lb/hr} * \text{hr/year operating schedule}] + [2 * EF \text{ for truck load and dump of material (Section 13.2.4) lb/ton} * \text{ton/year process rate}]$$

silt %, s = 6.9 (Table 11.9-3, bulldozing overburden) - this value was used instead of the road silt value for a more conservative estimate  
 Moisture %, M = 3.4 (Table 13.2.4-1, Western surface coal mining exposed ground mean moisture content)

Emission factor calculations for topsoil removal:

Table 11.9-1 provides equations to calculate EF in terms of lb/hr for TSP and PM<sub>15</sub>, with a scaling factor for PM<sub>10</sub> as a function of PM<sub>15</sub>.

$$\text{Topsoil removal } EF_{PM} = EF_{TSP} \text{ for topsoil removal by bulldozing (Table 11.9-1 for overburden bulldozing)} = 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

**Topsoil removal EF<sub>PM</sub> = 11.792 lb/hr**

$$\text{Topsoil removal } EF_{PM_{10}} = 0.75 * EF_{PM_{15}} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.75 * 1.0 * (s)^{1.5} / (M)^{1.4}$$

**Topsoil removal EF<sub>PM10</sub> = 2.451 lb/hr**

$$\text{Topsoil removal } EF_{PM_{2.5}} = 0.105 * EF_{TSP} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.105 * 5.7 * (s)^{1.2} / (M)^{1.3}$$

**Topsoil removal EF<sub>PM2.5</sub> = 1.238 lb/hr**

<b>Dozer clearing rate</b>	<b>Bulk Density</b>
<i>Klanfar et al. 2014</i>	<i>Engineering Toolbox</i>
535 m <sup>3</sup> /hr (Avg.)	Soil, High 1600 kg/m <sup>3</sup>
	Soil, Low 1200 kg/m <sup>3</sup>
<b>Conversions</b>	Clay, High 2600 kg/m <sup>3</sup>
907.185 kg/ton	Clay, Low 1800 kg/m <sup>3</sup>
12 hrs/day	<b>Average 1800 kg/m<sup>3</sup></b>
4380 hrs/yr	

$$\text{Topsoil removal } EF_{PM} = EF_{PM} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 11.792 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM</sub> = 0.01111 lb PM / ton**

$$\text{Topsoil removal } EF_{PM_{10}} = EF_{PM_{10}} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 2.451 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM10</sub> = 0.00231 lb PM<sub>10</sub> / ton**

$$\text{Topsoil removal } EF_{PM_{2.5}} = EF_{PM_{2.5}} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 1.238 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM2.5</sub> = 0.00117 lb PM<sub>2.5</sub> / ton**

Emission factor calculations for truck loading and dumping (section 13.2.4)

$$E = k * (0.0032) * (U/5)^{1.3} / (M/2)^{1.4} \text{ lb/ton}$$

Equation (1), section 13.2.4, emission factor for drop operations

k = 0.74 < 30 um PM  
0.35 < 10 um PM  
0.053 < 2.5 um PM  
U = 9.3 mean windspeed, mph (standard windspeed for MT per MDEQ)  
M = 3.4 material moisture content, %

**Truck load and dump EF<sub>PM</sub> = 0.00252 lb/ton**

**Truck load and dump EF<sub>PM10</sub> = 0.00119 lb/ton**

**Truck load and dump EF<sub>PM2.5</sub> = 0.00018 lb/ton**

F13

**Air Emissions Calculations**

**Tintina Montana Inc. Black Butte Copper Project**

**Material transfer from CWP and mill pad area to N reclamation stockpile**

Excess material from the CWP, Cu-enriched ore stockpile, WRS stockpile, and mill pad, is transferred to the north reclamation stockpile

This activity occurs in year 0 - 1.

Excavated material from each area is transferred to North Reclamation Stockpile

**Process Information**

Process Rate:	263,360	tons/yr
Operating Time:	365	days/yr
Operating Time:	12	hr/day
Process Rate:	60.13	tons/hr
Number of Transfers:	2	load + dump

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	see below - 11.792 lb/hr and 0.00252 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.97	11.66	2.13	20% opacity	0.97	11.66	2.13	None		ARM 17.8.308
PM <sub>10</sub>	see below - 2.451 lb/hr and 0.00119 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.28	3.39	0.62	20% opacity	0.28	3.39	0.20	None		ARM 17.8.308
PM <sub>2.5</sub>	see below - 1.238 lb/hr and 0.00018 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.09	1.10	0.20	20% opacity	0.09	1.10	0.20	None		ARM 17.8.308

Assume: Removing excess material from pond areas and storage pads is equivalent to bulldozing overburden in Table 11.9-1 per Table 13.2.3-1

Assume: PM = TSP where no other PM data are available

Assume: Each ton of material moved goes through two drops - one into a truck, and one into a pile.

**Uncontrolled Emissions Calculations:**

$$PM = (2.13 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00252 \text{ lb/ton}) * (60 \text{ tons/hr}) * (2 \text{ drops}) = 0.97 \text{ lb/hr}$$

$$PM = (0.97 \text{ lb/hr}) * (12 \text{ hr/day}) = 11.66 \text{ lb/day}$$

$$PM = (0.011 \text{ lb PM} / \text{ton}) * (263360 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00252 \text{ lb/ton}) * (263,360 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 2.13 \text{ tpy}$$

$$PM_{10} = (0.62 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00119 \text{ lb/ton}) * (60 \text{ tons/hr}) * (2 \text{ drops}) = 0.28 \text{ lb/hr}$$

$$PM_{10} = (0.28 \text{ lb/hr}) * (12 \text{ hr/day}) = 3.39 \text{ lb/day}$$

$$PM_{10} = (0.002 \text{ lb PM}_{10} / \text{ton}) * (263360 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00119 \text{ lb/ton}) * (263,360 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.62 \text{ tpy}$$

$$PM_{2.5} = (0.20 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00018 \text{ lb/ton}) * (60 \text{ tons/hr}) * (2 \text{ drops}) = 0.09 \text{ lb/hr}$$

$$PM_{2.5} = (0.09 \text{ lb/hr}) * (12 \text{ hr/day}) = 1.10 \text{ lb/day}$$

$$PM_{2.5} = (0.001 \text{ lb PM}_{2.5} / \text{ton}) * (263360 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00018 \text{ lb/ton}) * (263,360 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.20 \text{ tpy}$$

**PM Emission Factor Calculations:**

$$EF_{PM_{PM10}/PM_{2.5}} = [EF \text{ for topsoil removal (bulldozing of overburden, Table 11.9-1) lb/hr} * \text{hr/year operating schedule}] + [2 * EF \text{ for truck load and dump of material (Section 13.2.4) lb/ton} * \text{ton/year process rate}]$$

silt %, s = 6.9 (Table 11.9-3, bulldozing overburden) - this value was used instead of the road silt value for a more conservative estimate  
 Moisture %, M = 3.4 (Table 13.2.4-1, Western surface coal mining exposed ground mean moisture content)

Emission factor calculations for topsoil removal:

Table 11.9-1 provides equations to calculate EF in terms of lb/hr for TSP and PM<sub>15</sub>, with a scaling factor for PM<sub>10</sub> as a function of PM<sub>15</sub>.

$$\text{Topsoil removal } EF_{PM} = EF_{TSP} \text{ for topsoil removal by bulldozing (Table 11.9-1 for overburden bulldozing)} = 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

**Topsoil removal EF<sub>PM</sub> = 11.792 lb/hr**

$$\text{Topsoil removal } EF_{PM10} = 0.75 * EF_{PM15} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.75 * 1.0 * (s)^{1.5} / (M)^{1.4} \text{ lb/hr}$$

**Topsoil removal EF<sub>PM10</sub> = 2.451 lb/hr**

$$\text{Topsoil removal } EF_{PM2.5} = 0.105 * EF_{TSP} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.105 * 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

**Topsoil removal EF<sub>PM2.5</sub> = 1.238 lb/hr**

**Dozer clearing rate**

Klanfar et al. 2014  
535 m<sup>3</sup>/hr (Avg.)

**Bulk Density**

<i>Engineering Toolbox</i>	
Soil, High	1600 kg/m <sup>3</sup>
Soil, Low	1200 kg/m <sup>3</sup>
Clay, High	2600 kg/m <sup>3</sup>
Clay, Low	1800 kg/m <sup>3</sup>
<b>Average</b>	<b>1800 kg/m<sup>3</sup></b>

**Conversions**

907.185 kg/ton  
12 hrs/day  
4380 hrs/yr

$$\text{Topsoil removal } EF_{PM} = EF_{PM} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 11.792 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM</sub> = 0.01111 lb PM / ton**

$$\text{Topsoil removal } EF_{PM10} = EF_{PM10} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 2.451 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM10</sub> = 0.00231 lb PM<sub>10</sub> / ton**

$$\text{Topsoil removal } EF_{PM2.5} = EF_{PM2.5} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 1.238 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM2.5</sub> = 0.00117 lb PM<sub>2.5</sub> / ton**

Emission factor calculations for truck loading and dumping (section 13.2.4)

$$E = k * (0.0032) * (U/5)^{1.3} / (M/2)^{1.4} \text{ lb/ton}$$

Equation (1), section 13.2.4, emission factor for drop operations

k = 0.74 < 30 um PM  
0.35 < 10 um PM  
0.053 < 2.5 um PM  
U = 9.3 mean windspeed, mph (standard windspeed for MT per MDEQ)  
M = 3.4 material moisture content, %

Truck load and dump  $EF_{PM}$  = 0.00252 lb/ton  
Truck load and dump  $EF_{PM10}$  = 0.00119 lb/ton  
Truck load and dump  $EF_{PM2.5}$  = 0.00018 lb/ton

**F14**  
**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Excess reclamation stockpile (North) (Table 3-13, 3.4.1)**

Material from WRS excavation; trapezoid shape, 30 ft max height (3.6.10).

Operations	Conversions
12 hr/day	43,560 ft <sup>2</sup> / acre
365 days/year	0.3048 m / ft
1 material pile disturbances/hr	453.593 g / lb
18 disturbances/day, year 0-1	2000 lb / ton
36 m <sup>2</sup> , disturbance area	
0.01 acre, disturbance area	
30 ft, max pile height	
623 ft, length	
492 ft, width	
50% dust control efficiency by water spray as needed	

**Data Sets Used to Estimate Emissions**

Meteorological data was collected near the proposed minesite from mid-2012 through 4th quarter 2017.

Year 2013 maximum 1-hour average windspeed recorded per day was used for these calculations because the highest hourly windspeed was recorded that year (Table 1 below).

Year 2016 maximum 1-hour average windspeed recorded per day was used for these calculations because it is the most recent complete year of data available for the site (Table 2 below).

Table 3 below compares the daily erosion potential (P) between the 2013 and 2016 calculated erosion potential and lists the highest of the two values as an estimate of wind erosion for that day.

**Assumptions:**

Assumes flat pile, such that the height to base ratio is less than 0.2:  
height to base (shortest length) ratio: 0.06

Fastest mile of wind,  $u_{10}^*$  = 1.35 \* annual maximum 1-hour average wind speed (assumption based on industry convention and a conservative approach - see Wind Conv. (2) worksheet)

Friction velocity,  $u^*$  = 0.053 \*  $u_{10}^*$  (Eqn. 4 from AP-42 Ch. 13.2.5)

Threshold friction velocity,  $u_t^*$  = 1.02 m/s excess reclamation storage (assume surface similar to overburden from Table 13.2.5-2)

N = 4,380 number of disturbances per year  
36 m<sup>2</sup>/disturbance

**Emissions Potential Calculations:**

$$P = [58 (u^* - u_t^*)^2 + 25 (u^* - u_t^*)] \quad \text{Eq. 3 from AP-42 Ch. 13.2.5-5}$$

Where:

P = erosion potential, g/m<sup>2</sup>/disturbance event - P is calculated for each calendar day (as P\_daily) in year 2013 (Table 1) and year 2016 (Table 2). Table 3 lists the largest P\_daily calculated for that calendar day between Tables 1 and 2.

$u^*$  = friction velocity, m/s - maximum daily 1-hour average wind speeds for year 2013 and year 2016 were used to determine  $u^*$  for each day of the year according to assumptions listed above

$u_t^*$  = 1.02 threshold friction velocity for pile, m/s (overburden, Table 13.2.5-2)

$$P_{\text{annual}} [g / (m^2 \cdot \text{year})] = \frac{\text{day 365}}{n = \text{day 1}} P_{\text{daily}} [g / (m^2 \cdot \text{event})] * 18.0383561643836 \text{ hr/day} * 1 \text{ events/} \quad 104.12 \quad g / (m^2 \cdot \text{year}) \text{ (from the bottom of Table 3 below)}$$

**Emissions Calculations:**

$$ER = P_{\text{annual}} * A * c * k$$

Where:

ER = emission rate for each pollutant, ton/yr

$P_{\text{annual}} =$	104.12	g / (m <sup>2</sup> *year) - emission potential for a conservatively worst case year (see above)
	0.230	lb / (m <sup>2</sup> *year)
	1.15E-04	ton / (m <sup>2</sup> *year)
A =	36	m <sup>2</sup> - disturbance area
c =	50%	control efficiency (assumed)
k =	1.0	PM particle size multiplier, pg. 13.2.5-3: PM = 1.0, PM10 = 0.5, PM2.5 = 0.075
	0.5	PM10
	0.075	PM2.5

**Results:**

TSP, tpy	2.07E-03	F14	Wind
PM10, tpy	1.03E-03		
PM2.5, tpy	1.55E-04		



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**Air Emissions Calculations**

**Tintina Montana Inc. Black Butte Copper Project**

**Material transfer from N reclamation stockpile to CWP and mill pad area**

Material is transferred from the north reclamation stockpile back to the CWP, Cu-enriched ore stockpile, and mill pad for reclamation

This activity occurs in years 16-18.

**Process Information**

Process Rate:	101,360	tons/yr - year 18, maximum annual rate
Operating Time:	365	days/yr
Operating Time:	12	hr/day
Process Rate:	23.14	tons/hr
Number of Transfers:	2	load + dump

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	see below - 11.792 lb/hr and 0.00252 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.37	4.49	0.82	20% opacity	0.37	4.49	0.82	None		ARM 17.8.308
PM <sub>10</sub>	see below - 2.451 lb/hr and 0.00119 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.11	1.30	0.24	20% opacity	0.11	1.30	0.24	None		ARM 17.8.308
PM <sub>2.5</sub>	see below - 1.238 lb/hr and 0.00018 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.04	0.42	0.08	20% opacity	0.04	0.42	0.08	None		ARM 17.8.308

Assume: Returning material to pond areas and storage pads is equivalent to bulldozing overburden in Table 11.9-1 per Table 13.2.3-1

Assume: PM = TSP where no other PM data are available

Assume: Each ton of material moved goes through two drops - one into a truck, and one into a pile.

**Uncontrolled Emissions Calculations:**

$$PM = (0.82 \text{ tons/yr - year 18, maximum annual rate}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00252 \text{ lb/ton}) * (23 \text{ tons/hr}) * (2 \text{ drops}) = 0.37 \text{ lb/hr}$$

$$PM = (0.37 \text{ lb/hr}) * (12 \text{ hr/day}) = 4.49 \text{ lb/day}$$

$PM = (0.011 \text{ lb PM / ton}) * (101360 \text{ tons/yr - year 18, maximum annual rate}) / [2,000 \text{ lb/ton}] + (0.00252 \text{ lb/ton}) * (101,360 \text{ tons/yr - year 18, maximum annual rate}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.82 \text{ tpy}$   
 $PM_{10} = \text{\#REF!}$   
 $PM_{10} = (0.11 \text{ lb/hr}) * (12 \text{ hr/day}) = 1.30 \text{ lb/day}$   
 $PM_{10} = \text{\#REF!}$   
 $PM_{2.5} = \text{\#REF!}$   
 $PM_{2.5} = (0.04 \text{ lb/hr}) * (12 \text{ hr/day}) = 0.42 \text{ lb/day}$   
 $PM_{2.5} = \text{\#REF!}$

**PM Emission Factor Calculations:**

$EF_{PM/PM_{10}/PM_{2.5}} = [EF \text{ for topsoil removal (bulldozing of overburden, Table 11.9-1) lb/hr * hr/year operating schedule}] + [2 * EF \text{ for truck load and dump of material (Section 13.2.4) lb/ton * ton/year process rate}]$

silt %, s = 6.9 (Table 11.9-3, bulldozing overburden) - this value was used instead of the road silt value for a more conservative estimate  
 Moisture %, M = 3.4 (Table 13.2.4-1, Western surface coal mining exposed ground mean moisture content)

Emission factor calculations for topsoil removal:

Table 11.9-1 provides equations to calculate EF in terms of lb/hr for TSP and  $PM_{15\mu}$ , with a scaling factor for  $PM_{10}$  as a function of  $PM_{15\mu}$ .

Topsoil removal  $EF_{PM} = EF_{TSP}$  for topsoil removal by bulldozing (Table 11.9-1 for overburden bulldozing) =  $5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$

Topsoil removal  $EF_{PM} = 11.792 \text{ lb/hr}$

Topsoil removal  $EF_{PM_{10}} = 0.75 * EF_{PM_{15}}$  (Table 11.9-1 for overburden bulldozing) =  $0.75 * 1.0 * (s)^{1.5} / (M)^{1.4} \text{ lb/hr}$

Topsoil removal  $EF_{PM_{10}} = 2.451 \text{ lb/hr}$

Topsoil removal  $EF_{PM_{2.5}} = 0.105 * EF_{TSP}$  (Table 11.9-1 for overburden bulldozing) =  $0.105 * 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$

Topsoil removal  $EF_{PM_{2.5}} = 1.238 \text{ lb/hr}$

**Dozer clearing rate**

*Klanfar et al. 2014*

535 m<sup>3</sup>/hr (Avg.)

**Bulk Density**

*Engineering Toolbox*

Soil, High 1600 kg/m<sup>3</sup>

Soil, Low 1200 kg/m<sup>3</sup>

Clay, High 2600 kg/m<sup>3</sup>

Clay, Low 1800 kg/m<sup>3</sup>

**Average 1800 kg/m<sup>3</sup>**

**Conversions**

907.185 kg/ton

12 hrs/day

4380 hrs/yr

Topsoil removal  $EF_{PM} = EF_{PM} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 11.792 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$

**Topsoil removal  $EF_{PM} = 0.01111 \text{ lb PM / ton}$**

Topsoil removal  $EF_{PM_{10}} = EF_{PM_{10} \text{ (lb/hr)}} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 2.451 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$

**Topsoil removal  $EF_{PM_{10}} = 0.00231 \text{ lb PM}_{10} / \text{ton}$**

Topsoil removal  $EF_{PM_{2.5}} = EF_{PM_{2.5} \text{ (lb/hr)}} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 1.238 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$

**Topsoil removal  $EF_{PM_{2.5}} = 0.00117 \text{ lb PM}_{2.5} / \text{ton}$**

Emission factor calculations for truck loading and dumping (section 13.2.4)

$E = k * (0.0032) * (U/5)^{1.3} / (M/2)^{1.4} \text{ lb/ton}$

Equation (1), section 13.2.4, emission factor for drop operations

k = 0.74 < 30 um PM

0.35 < 10 um PM

0.053 < 2.5 um PM

U = 9.3 mean windspeed, mph (standard windspeed for MT per MDEQ)

M = 3.4 material moisture content, %

**Truck load and dump  $EF_{PM} = 0.00252 \text{ lb/ton}$**

**Truck load and dump  $EF_{PM_{10}} = 0.00119 \text{ lb/ton}$**

**Truck load and dump  $EF_{PM_{2.5}} = 0.00018 \text{ lb/ton}$**

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**Air Emissions Calculations**

**Tintina Montana Inc. Black Butte Copper Project**

**Land Clearing and Topsoil and Subsoil Transfer to Storage Piles**

Topsoil and subsoil stripping (i.e., bulldozing/scraping) and stockpiling for mine development  
 This activity occurs in year 0 - 1.

**Process Information**

Dozing Process Rate:	622,332	tons/yr
Transfer Process Rate:	609,340	tons/yr
Operating Time:	365	days/yr
Operating Time:	12	hr/day
Process Rate:	139.12	tons/hr
Number of Transfers:	2	load + dump

Note (1)

Based on Transfer Process rate

(1) On-site storage at certain areas - see analysis at bottom of page

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	see below - 11.792 lb/hr and 0.00252 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	2.28	27.37	4.99	20% opacity	2.28	27.37	4.99	None		ARM 17.8.308
PM <sub>10</sub>	see below - 2.451 lb/hr and 0.00119 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.66	7.92	1.45	20% opacity	0.66	7.92	1.45	None		ARM 17.8.308

PM <sub>2.5</sub>	see below - 1.238 lb/hr and 0.00018 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.22	2.59	0.47	20% opacity	0.22	2.59	0.47	None	ARM 17.8.308
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Assume: Topsoil and subsoil stripping is equivalent to bulldozing overburden in Table 11.9-1 per Table 13.2.3-1

Assume: PM = TSP where no other PM data are available

Assume: Each ton of material moved goes through two drops - one into a truck, and one into a pile.

**Uncontrolled Emissions Calculations:**

$$PM = (4.99 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00252 \text{ lb/ton}) * (139 \text{ tons/hr}) * (2 \text{ drops}) = 2.28 \text{ lb/hr}$$

$$PM = (2.28 \text{ lb/hr}) * (12 \text{ hr/day}) = 27.37 \text{ lb/day}$$

$$PM = (0.011 \text{ lb PM / ton}) * (622332 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00252 \text{ lb/ton}) * (609,340 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 4.99 \text{ tpy}$$

$$PM_{10} = (1.45 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00000) * (139 \text{ tons/hr}) * (2 \text{ drops}) = 0.66 \text{ lb/hr}$$

$$PM_{10} = (0.66 \text{ lb/hr}) * (12 \text{ hr/day}) = 7.92 \text{ lb/day}$$

$$PM_{10} = (0.002 \text{ lb PM}_{10} / \text{ton}) * (622332 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00000) * (609,340 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 1.45 \text{ tpy}$$

$$PM_{2.5} = (0.47 \text{ tons/yr}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00000) * (139 \text{ tons/hr}) * (2 \text{ drops}) = 0.22 \text{ lb/hr}$$

$$PM_{2.5} = (0.22 \text{ lb/hr}) * (12 \text{ hr/day}) = 2.59 \text{ lb/day}$$

$$PM_{2.5} = (0.001 \text{ lb PM}_{2.5} / \text{ton}) * (622332 \text{ tons/yr}) / [2,000 \text{ lb/ton}] + (0.00000) * (609,340 \text{ tons/yr}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.47 \text{ tpy}$$

**PM Emission Factor Calculations:**

$$EF_{PM_{PM10}/PM_{2.5}} = [EF \text{ for topsoil removal (bulldozing of overburden, Table 11.9-1) lb/hr} * \text{hr/year operating schedule}] + [2 * EF \text{ for truck load and dump of material (Section 13.2.4) lb/ton} * \text{ton/year process rate}]$$

$$\text{silt \%}, s = 6.9 \quad (\text{Table 11.9-3, bulldozing overburden}) - \text{this value was used instead of the road silt value for a more conservative estimate}$$

$$\text{Moisture \%}, M = 3.4 \quad (\text{Table 13.2.4-1, Western surface coal mining exposed ground mean moisture content})$$

Emission factor calculations for topsoil removal:

Table 11.9-1 provides equations to calculate EF in terms of lb/hr for TSP and PM<sub>15</sub>, with a scaling factor for PM<sub>10</sub> as a function of PM<sub>15</sub>.

$$\text{Topsoil removal } EF_{PM} = EF_{TSP} \text{ for topsoil removal by bulldozing (Table 11.9-1 for overburden bulldozing)} = 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM} = 11.792 \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM_{10}} = 0.75 * EF_{PM_{15}} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.75 * 1.0 * (s)^{1.5} / (M)^{1.4} \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM_{10}} = 2.451 \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM_{2.5}} = 0.105 * EF_{TSP} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.105 * 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

$$\text{Topsoil removal } EF_{PM_{2.5}} = 1.238 \text{ lb/hr}$$

**Dozer clearing rate**

*Klanfar et al. 2014*

535 m<sup>3</sup>/hr (Avg.)

**Bulk Density**

*Engineering Toolbox*

Soil, High 1600 kg/m<sup>3</sup>

Soil, Low 1200 kg/m<sup>3</sup>

Clay, High 2600 kg/m<sup>3</sup>

Clay, Low 1800 kg/m<sup>3</sup>

**Conversions**

907.185 kg/ton

12 hrs/day

4380 hrs/yr

**Average 1800 kg/m<sup>3</sup>**

$$\text{Topsoil removal } EF_{PM} = EF_{PM \text{ (lb/hr)}} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 11.792 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM</sub> = 0.01111 lb PM / ton**

Topsoil removal EF<sub>PM10</sub> = EF<sub>PM10 (lb/hr)</sub> \* (1/Dozer clearing rate) \* (1/Avg. Bulk Density) \* (907.185 kg/ton) = 2.451 lb/hr \* (hr/535 m<sup>3</sup>) \* (m<sup>3</sup>/1800 kg) \* (907.185 kg/ton)

**Topsoil removal EF<sub>PM10</sub> = 0.00231 lb PM10 / ton**

Topsoil removal EF<sub>PM2.5</sub> = EF<sub>PM2.5 (lb/hr)</sub> \* (1/Dozer clearing rate) \* (1/Avg. Bulk Density) \* (907.185 kg/ton) = 1.238 lb/hr \* (hr/535 m<sup>3</sup>) \* (m<sup>3</sup>/1800 kg) \* (907.185 kg/ton)

**Topsoil removal EF<sub>PM2.5</sub> = 0.00117 lb PM2.5 / ton**

Emission factor calculations for truck loading and dumping (section 13.2.4)

$$E = k * (0.0032) * (U/5)^{1.3} / (M/2)^{1.4} \text{ lb/ton}$$

Equation (1), section 13.2.4, emission factor for drop operations

k = 0.74 < 30 um PM  
0.35 < 10 um PM  
0.053 < 2.5 um PM  
U = 9.3 mean windspeed, mph (standard windspeed for MT per MDEQ)  
M = 3.4 material moisture content, %

**Truck load and dump EF<sub>PM</sub> = 0.00252 lb/ton**

**Truck load and dump EF<sub>PM10</sub> = 0.00119 lb/ton**

**Truck load and dump EF<sub>PM2.5</sub> = 0.00018 lb/ton**

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**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Topsoil pile (Table 3-13, 3.4.1, 3.6.10)**

<u>Operations</u>	<u>Conversions</u>
12 hr/day	43,560 ft <sup>2</sup> / acre
365 days/year	0.3048 m / ft
1 material pile disturbances/hr	453.593 g / lb
42 disturbances/day (topsoil+subsoil total)	2000 lb / ton
36 m <sup>2</sup> , disturbance area	
0.01 acre, disturbance area	
30 ft, max pile height	
525 ft, length	
492 ft, width	
50% dust control efficiency by water spray as needed	

**Data Sets Used to Estimate Emissions**

Meteorological data was collected near the proposed minesite from mid-2012 through 4th quarter 2017.  
 Year 2013 maximum 1-hour average windspeed recorded per day was used for these calculations because the highest hourly windspeed was recorded that year (Table 1 below).  
 Year 2016 maximum 1-hour average windspeed recorded per day was used for these calculations because it is the most recent complete year of data available for the site (Table 2 below).  
 Table 3 below compares the daily erosion potential (P) between the 2013 and 2016 calculated erosion potential and lists the highest of the two values as an estimate of wind erosion for that day.

**Assumptions:**

Assumes flat pile, such that the height to base ratio is less than 0.2:  
 height to base (shortest length) ratio: 0.06

Fastest mile of wind,  $u_{10}^+$  = 1.35 \* annual maximum 1-hour average wind speed (assumption based on industry convention and a conservative approach - see Wind Conv. (2) worksheet)  
 Friction velocity,  $u^*$  = 0.053 \*  $u_{10}^+$  (Eqn. 4 from AP-42 Ch. 13.2.5)

Threshold friction velocity,  $u_t^+$  = 1.02 m/s topsoil storage (assume surface similar to overburden from Table 13.2.5-2)

N = 4,380 number of disturbances per year  
 36 m<sup>2</sup>/disturbance

**Emissions Potential Calculations:**

$P = [58 (u^* - u_t^*)^2 + 25 (u^* - u_t^*)]$  Eq. 3 from AP-42 Ch. 13.2.5-5

Where:  
 P = erosion potential, g/m<sup>2</sup>/disturbance event - P is calculated for each calendar day (as P<sub>daily</sub>) in year 2013 (Table 1) and year 2016 (Table 2). Table 3 lists the largest P<sub>daily</sub> calculated for that calendar day between Tables 1 and 2.  
 $u^*$  = friction velocity, m/s - maximum daily 1-hour average wind speeds for year 2013 and year 2016 were used to determine  $u^*$  for each day of the year according to assumptions listed above  
 $u_t^+$  = 1.02 threshold friction velocity for pile, m/s (overburden, Table 13.2.5-2)

$P_{\text{annual}} [g / (m^2 \cdot \text{year})] = \text{day } 365 \cdot P_{\text{daily}} [g / (m^2 \cdot \text{event})] * 41.7356164383562 \text{ hr/day} * 1 \text{ events/} 104.12 \text{ g} / (m^2 \cdot \text{year})$  (from the bottom of Table 3 below)  
 n = day 1

**Emissions Calculations:**

$ER = P_{\text{annual}} * A * c * k$

Where:  
 ER = emission rate for each pollutant, ton/yr  
 $P_{\text{annual}} = 104.12 \text{ g} / (m^2 \cdot \text{year})$  - emission potential for a conservatively worst case year (see above)  
 0.230 lb / (m<sup>2</sup>·year)  
 1.15E-04 ton / (m<sup>2</sup>·year)  
 A = 36 m<sup>2</sup> - disturbance area  
 c = 50% control efficiency (assumed)  
 k = 1.0 PM particle size multiplier, pg. 13.2.5-3: PM = 1.0, PM10 = 0.5, PM2.5 = 0.075  
 0.5 PM10  
 0.075 PM2.5

**Results:**

TSP, tpy	2.07E-03		
PM10, tpy	1.03E-03	F17	Wind
PM2.5, tpy	1.55E-04		

**F18**  
**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Subsoil pile (Table 3-13, 3.4.1, 3.6.10)**

<u>Operations</u>	<u>Conversions</u>
12 hr/day	43,560 ft <sup>2</sup> / acre
365 days/year	0.3048 m / ft
1 material pile disturbances/hr	453.593 g / lb
42 disturbances/day (topsoil+subsoil total)	2000 lb / ton
36 m <sup>2</sup> , disturbance area	
0.01 acre, disturbance area	
30 ft, max pile height	
1,083 ft, length	
558 ft, width	
50% dust control efficiency by water spray as needed	

**Data Sets Used to Estimate Emissions**

Meteorological data was collected near the proposed minesite from mid-2012 through 4th quarter 2017.  
 Year 2013 maximum 1-hour average windspeed recorded per day was used for these calculations because the highest hourly windspeed was recorded that year (Table 1 below).  
 Year 2016 maximum 1-hour average windspeed recorded per day was used for these calculations because it is the most recent complete year of data available for the site (Table 2 below).  
 Table 3 below compares the daily erosion potential (P) between the 2013 and 2016 calculated erosion potential and lists the highest of the two values as an estimate of wind erosion for that day.

**Assumptions:**

Assumes flat pile, such that the height to base ratio is less than 0.2:  
 height to base (shortest length) ratio: 0.05

Fastest mile of wind,  $u_{10}^+$  = 1.35 \* annual maximum 1-hour average wind speed (assumption based on industry convention and a conservative approach - see Wind Conv. (2) worksheet)  
 Friction velocity,  $u^*$  = 0.053 \*  $u_{10}^+$  (Eqn. 4 from AP-42 Ch. 13.2.5)

Threshold friction velocity,  $u_t^+$  = 1.02 m/s subsoil storage (assume surface simliar to overburden from Table 13.2.5-2)

N = 4,380 number of disturbances per year  
 36 m<sup>2</sup>/disturbance

**Emissions Potential Calculations:**

$P = [58 (u^* - u_t^*)^2 + 25 (u^* - u_t^*)]$  Eq. 3 from AP-42 Ch. 13.2.5-5

Where:  
 P = erosion potential, g/m<sup>2</sup>/disturbance event - P is calculated for each calendar day (as P\_daily) in year 2013 (Table 1) and year 2016 (Table 2). Table 3 lists the largest P\_daily calculated for that calendar day between Tables 1 and 2.  
 $u^*$  = friction velocity, m/s - maximum daily 1-hour average wind speeds for year 2013 and year 2016 were used to determine  $u^*$  for each day of the year according to assumptions listed above  
 $u_t^+$  = 1.02 threshold friction velocity for pile, m/s (overburden, Table 13.2.5-2)

$P_{\text{annual}} [g / (m^2 \cdot \text{year})] = \text{day 365} \quad P_{\text{daily}} [g / (m^2 \cdot \text{event})] * 41.7356164383562 \text{ hr/day} * 1 \text{ events/} \quad 104.12 \quad g / (m^2 \cdot \text{year}) \text{ (from the bottom of Table 3 below)}$   
 $n = \text{day 1}$

**Emissions Calculations:**

$ER = P_{\text{annual}} * A * c * k$

Where:  
 ER = emission rate for each pollutant, ton/yr  
 $P_{\text{annual}} = 104.12 \text{ g} / (m^2 \cdot \text{year})$  - emission potential for a conservatively worst case year (see above)  
 0.230 lb / (m<sup>2</sup>·year)  
 1.15E-04 ton / (m<sup>2</sup>·year)  
 A = 36 m<sup>2</sup> - disturbance area  
 c = 50% control efficiency (assumed)  
 k = 1.0 PM particle size multiplier, pg. 13.2.5-3: PM = 1.0, PM10 = 0.5, PM2.5 = 0.075  
 0.5 PM10  
 0.075 PM2.5

**Results:**

TSP, tpy	2.07E-03		
PM10, tpy	1.03E-03	F18	Wind
PM2.5, tpy	1.55E-04		

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**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Topsoil and Subsoil Transfer for Reclamation**

Topsoil and subsoil replacement for mine closure and reclamation  
 This activity occurs in years 16-18

**Process Information**

Process Rate:	516,799	tons/yr - year 17, maximum annual rate
Operating Time:	365	days/yr
Operating Time:	12	hr/day
Process Rate:	117.99	tons/hr
Number of Transfers:	2	load + dump

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	see below - 11.792 lb/hr and 0.00252 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	1.91	22.88	4.17	20% opacity	1.91	22.88	4.17	None		ARM 17.8.308
PM <sub>10</sub>	see below - 2.451 lb/hr and 0.00119 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.55	6.65	1.21	20% opacity	0.55	6.65	1.21	None		ARM 17.8.308
PM <sub>2.5</sub>	see below - 1.238 lb/hr and 0.00018 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.18	2.16	0.39	20% opacity	0.18	2.16	0.39	None		ARM 17.8.308

Assume: Topsoil and subsoil replacement is equivalent to bulldozing overburden in Table 11.9-1 per Table 13.2.3-1

Assume: PM = TSP where no other PM data are available

Assume: Each ton of material moved goes through two drops - one into a truck, and one into a pile.

**Uncontrolled Emissions Calculations:**

$$PM = (4.17 \text{ tons/yr - year 17, maximum annual rate}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00252 \text{ lb/ton}) * (118 \text{ tons/hr}) * (2 \text{ drops}) = 1.91 \text{ lb/hr}$$

$$PM = (1.91 \text{ lb/hr}) * (12 \text{ hr/day}) = 22.88 \text{ lb/day}$$

$$PM = (0.011 \text{ lb PM / ton}) * (516799 \text{ tons/yr - year 17, maximum annual rate}) / [2,000 \text{ lb/ton}] + (0.00252 \text{ lb/ton}) * (516,799 \text{ tons/yr - year 17, maximum annual rate}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 4.17 \text{ tpy}$$

$$PM_{10} = (1.21 \text{ tons/yr - year 17, maximum annual rate}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00119 \text{ lb/ton}) * (118 \text{ tons/hr}) * (2 \text{ drops}) = 0.55 \text{ lb/hr}$$

$$PM_{10} = (0.55 \text{ lb/hr}) * (12 \text{ hr/day}) = 6.65 \text{ lb/day}$$



$$PM_{10} = (0.002 \text{ lb PM}_{10} / \text{ton}) * (516799 \text{ tons/yr} - \text{year 17, maximum annual rate}) / [2,000 \text{ lb/ton}] + (0.00119 \text{ lb/ton}) * (516,799 \text{ tons/yr} - \text{year 17, maximum annual rate}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 1.21 \text{ tpy}$$

$$PM_{2.5} = (0.39 \text{ tons/yr} - \text{year 17, maximum annual rate}) * [2,000 \text{ lb/ton}] / (4380 \text{ hrs/yr}) + (0.00018 \text{ lb/ton}) * (118 \text{ tons/hr}) * (2 \text{ drops}) = 0.18 \text{ lb/hr}$$

$$PM_{2.5} = (0.18 \text{ lb/hr}) * (12 \text{ hr/day}) = 2.16 \text{ lb/day}$$

$$PM_{2.5} = (0.001 \text{ lb PM}_{2.5} / \text{ton}) * (516799 \text{ tons/yr} - \text{year 17, maximum annual rate}) / [2,000 \text{ lb/ton}] + (0.00018 \text{ lb/ton}) * (516,799 \text{ tons/yr} - \text{year 17, maximum annual rate}) * (2 \text{ drops}) / [2,000 \text{ lb/ton}] = 0.39 \text{ tpy}$$

**PM Emission Factor Calculations:**

$$EF_{PM_{10}/PM_{2.5}} = [EF \text{ for topsoil removal (bulldozing of overburden, Table 11.9-1) lb/hr} * \text{hr/year operating schedule}] + [2^* EF \text{ for truck load and dump of material (Section 13.2.4) lb/ton} * \text{ton/year process rate}]$$

silt %, s = 6.9 (Table 11.9-3, bulldozing overburden) - this value was used instead of the road silt value for a more conservative estimate  
 Moisture %, M = 3.4 (Table 13.2.4-1, Western surface coal mining exposed ground mean moisture content)

Emission factor calculations for topsoil removal:

Table 11.9-1 provides equations to calculate EF in terms of lb/hr for TSP and PM<sub>15</sub>, with a scaling factor for PM<sub>10</sub> as a function of PM<sub>15</sub>.

Topsoil removal  $EF_{PM} = EF_{TSP}$  for topsoil removal by bulldozing (Table 11.9-1 for overburden bulldozing) =  $5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$   
**Topsoil removal  $EF_{PM} = 11.792 \text{ lb/hr}$**

Topsoil removal  $EF_{PM_{10}} = 0.75 * EF_{PM_{15}}$  (Table 11.9-1 for overburden bulldozing) =  $0.75 * 1.0 * (s)^{1.5} / (M)^{1.4} \text{ lb/hr}$   
**Topsoil removal  $EF_{PM_{10}} = 2.451 \text{ lb/hr}$**

Topsoil removal  $EF_{PM_{2.5}} = 0.105 * EF_{TSP}$  (Table 11.9-1 for overburden bulldozing) =  $0.105 * 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$   
**Topsoil removal  $EF_{PM_{2.5}} = 1.238 \text{ lb/hr}$**

Dozer clearing rate <i>Klanfar et al. 2014</i>	Bulk Density <i>Engineering Toolbox</i>
535 m <sup>3</sup> /hr (Avg.)	Soil, High 1600 kg/m <sup>3</sup>
	Soil, Low 1200 kg/m <sup>3</sup>
	Clay, High 2600 kg/m <sup>3</sup>
	Clay, Low 1800 kg/m <sup>3</sup>
	<b>Average 1800 kg/m<sup>3</sup></b>
<b>Conversions</b>	
907.185 kg/ton	
12 hrs/day	
4380 hrs/yr	

Topsoil removal  $EF_{PM} = EF_{PM} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 11.792 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$   
**Topsoil removal  $EF_{PM} = 0.01111 \text{ lb PM} / \text{ton}$**

Topsoil removal  $EF_{PM_{10}} = EF_{PM_{10}} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 2.451 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$   
**Topsoil removal  $EF_{PM_{10}} = 0.00231 \text{ lb PM}_{10} / \text{ton}$**

Topsoil removal  $EF_{PM_{2.5}} = EF_{PM_{2.5}} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 1.238 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$   
**Topsoil removal  $EF_{PM_{2.5}} = 0.00117 \text{ lb PM}_{2.5} / \text{ton}$**

Emission factor calculations for truck loading and dumping (section 13.2.4)

$$E = k * (0.0032) * (U/5)^{1.3} / (M/2)^{1.4} \text{ lb/ton}$$

Equation (1), section 13.2.4, emission factor for drop operations

k = 0.74 < 30 um PM  
 0.35 < 10 um PM  
 0.053 < 2.5 um PM

U = 9.3 mean windspeed, mph (standard windspeed for MT per MDEQ)

M = 3.4 material moisture content, %

**Truck load and dump  $EF_{PM} = 0.00252 \text{ lb/ton}$**

**Truck load and dump  $EF_{PM_{10}} = 0.00119 \text{ lb/ton}$**

**Truck load and dump  $EF_{PM_{2.5}} = 0.00018 \text{ lb/ton}$**

F20  
**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Coarse Ore Dumping at Cu-Enriched Rock Stockpile**

Ore dumped at the copper-enriched rock stockpile, maintained at 75,000 tons (11,429 in year 2, and 63,571 in year 3)

Process Information	
Operating Time:	8,760 hr/yr
Process Rate:	7.26 tons/hour
Process Rate:	174.17 tons/day
Process Rate:	63,571 tons/yr - year 3, highest annual rate
Number of Transfers:	1 Mine truck drop to stockpile

Non-Criteria Pollutant Emission Limits	
opacity	10%

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	0.01	lb/ton	AP-42 Section 11.24, (8/82) Table 11.24-2 (High Moisture Ore - Material Handling & Transfer - All Materials Except Bauxite) Metallic Mineral Processing	0.07	1.74	0.32	10% opacity	0.036	0.87	0.16	Water spray as needed	50%	ARM 17.8.340 40 CFR 60 Subpart LL
PM <sub>10</sub>	0.004	lb/ton	AP-42 Section 11.24 (8/82) Table 11.24-2 (High Moisture Ore - Material Handling & Transfer - All Materials Except Bauxite) Metallic Mineral Processing	0.03	0.70	0.13	10% opacity	0.0145	0.35	0.064	Water spray as needed	50%	ARM 17.8.340 40 CFR 60 Subpart LL
PM <sub>2.5</sub>	0.004	lb/ton	AP-42 Section 11.24 (8/82) Table 11.24-2 (High Moisture Ore - Material Handling & Transfer - All Materials Except Bauxite) Metallic Mineral Processing assume PM <sub>2.5</sub> = PM <sub>10</sub>	0.03	0.70	0.13	10% opacity	0.0145	0.35	0.064	Water spray as needed	50%	ARM 17.8.340 40 CFR 60 Subpart LL
			NO PM2.5 Ratio										

Uncontrolled Emissions Calculations:

$PM = (0.01 \text{ lb/ton})(63,571 \text{ tons/year})(1 \text{ transfers})(1 \text{ ton}/2000 \text{ lb}) = 0.32 \text{ tpy}$   
 $PM_{10} = (0.004 \text{ lb/ton})(63,571 \text{ tons/year})(1 \text{ transfers})(1 \text{ ton}/2000 \text{ lb}) = 0.13 \text{ tpy}$   
 $PM_{2.5} = (0.004 \text{ lb/ton})(63,571 \text{ tons/year})(1 \text{ transfers})(1 \text{ ton}/2000 \text{ lb}) = 0.13 \text{ tpy}$

Controlled Emissions Calculations:

$PM = (0.01 \text{ lb/ton})(63,571 \text{ tons/year})(1 \text{ ton}/2000 \text{ lb})(1-0.50) = 0.16 \text{ tpy}$   
 $PM_{10} = (0.004 \text{ lb/ton})(63,571 \text{ tons/year})(1 \text{ ton}/2000 \text{ lb})(1-0.50) = 0.06 \text{ tpy}$   
 $PM_{2.5} = (0.004 \text{ lb/ton})(63,571 \text{ tons/year})(1 \text{ ton}/2000 \text{ lb})(1-0.50) = 0.06 \text{ tpy}$

**F21**  
**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Copper-enriched rock stockpile (mill feed) (Tables 3-5 & 3-13, 3.4.1)**

**Operations**

24 hr/day  
 365 days/year  
 4 material pile disturbances/hr  
 92 disturbances/day, max trucks per day, yr 11  
 36 m<sup>2</sup>, disturbance area  
 0.01 acre, disturbance area  
 60 ft, max pile height  
 295 ft, length  
 295 ft, width  
 50% dust control efficiency by water spray as needed

**Conversions**

43,560 ft<sup>2</sup> / acre  
 0.3048 m / ft  
 453.593 g / lb  
 2000 lb / ton

Fugitive dust emissions from stockpiles of material, such as copper-enriched rock, topsoil, subsoil, waste rock from underground mine development, and excess earthen materials from construction, were estimated using the methods of EPA AP-42 Chapter 13.2.5 *Miscellaneous Sources: Industrial Wind Erosion*. Windspeed data collected very near the permitted mine boundary was used to estimate the erosion potential of each different type of stockpiled material. The equations described in AP-42 Chapter 13.2.5 utilize the "fastest mile" windspeed; however, the fastest mile windspeed was not recorded at the Tintina meteorological station. An estimated fastest mile windspeed was calculated using the measured daily maximum hourly average windspeed times the maximum ratio between fastest mile windspeed and maximum daily windspeed. This ratio was calculated as the highest fastest mile to hourly average windspeed ratio from a published windspeed conversion table (see the Wind Conv. worksheet). The daily highest hourly average windspeeds for the years 2013 and 2016 were copied from data collected at the Tintina meteorological station, and those windspeeds are listed in Tables 1 and 2 respectively. The fastest mile was estimated for each day of year 2013 and year 2016 as described. The erosion potential was then calculated for each day using Equation 3 from AP-42 Ch. 13.2.5. The calculated erosion potential for each calendar day of 2013 was compared against the corresponding erosion potential for the calendar day of 2016 and the largest erosion potential is copied into Table 3 for that day. The daily erosion potentials listed in Table 3 are then multiplied by the maximum possible daily disturbance events to provide a conservative estimate of erosion in grams per meter squared of disturbed area. The estimate is highly conservative because it assumes that the daily maximum eroding wind occurs after each material disturbance for that day.

**Data Sets Used to Estimate Emissions**

Meteorological data was collected near the proposed minesite from mid-2012 through 4th quarter 2017.  
 Year 2013 maximum 1-hour average windspeed recorded per day was used for these calculations because the highest hourly windspeed was recorded that year (Table 1 below).  
 Year 2016 maximum 1-hour average windspeed recorded per day was used for these calculations because it is the most recent complete year of data available for the site (Table 2 below).  
 Table 3 below compares the daily erosion potential (P) between the 2013 and 2016 calculated erosion potential and lists the highest of the two values as an estimate of wind erosion for that day.

**Assumptions:**

Assumes flat pile, such that the height to base ratio is less than 0.2:  
 height to base (shortest length) ratio: 0.20

Fastest mile of wind,  $u_{10}^+$  = 1.35 \* annual maximum 1-hour average wind speed (assumption based on industry convention and a conservative approach - see Wind Conv. (2) worksheet)  
 Friction velocity,  $u^*$  = 0.053 \*  $u_{10}^+$  (Eqn. 4 from AP-42 Ch. 13.2.5)

Threshold friction velocity,  $u_t^+$  = 1.12 m/s copper rock storage (assume surface similar to uncrusted coal pile from Table 13.2.5-2)

N = 33,725 number of disturbances per year  
 36 m<sup>2</sup>/disturbance

**Emissions Potential Calculations:**

$P = [58 (u^* - u_t^+)^2 + 25 (u^* - u_t^+)]$  Eq. 3 from AP-42 Ch. 13.2.5-5

Where:  
 P = erosion potential, g/m<sup>2</sup>/disturbance event - P is calculated for each calendar day (as P\_daily) in year 2013 (Table 1) and year 2016 (Table 2). Table 3 lists the largest P\_daily calculated for that calendar day between Tables 1 and 2.  
 $u^*$  = friction velocity, m/s - maximum daily 1-hour average wind speeds for year 2013 and year 2016 were used to determine  $u^*$  for each day of the year according to assumptions listed above  
 $u_t^+$  = 1.12 threshold friction velocity for pile, m/s (uncrusted coal pile, Table 13.2.5-2)

$P_{\text{annual}} [g / (m^2 \cdot \text{year})] =$  day 365  $P_{\text{daily}} [g / (m^2 \cdot \text{event})] * 92.3978082191781 \text{ hr/day} * 3.84990E-04$  156.04 g / (m<sup>2</sup>\*year) (from the bottom of Table 3 below)  
 n = day 1

**Emissions Calculations:**

$ER = P_{\text{annual}} * A * c * k$

Where:  
 ER = emission rate for each pollutant, ton/yr  
 $P_{\text{annual}} =$  156.04 g / (m<sup>2</sup>\*year) - emission potential for a conservatively worst case year (see above)  
 0.344 lb / (m<sup>2</sup>\*year)  
 1.72E-04 ton / (m<sup>2</sup>\*year)  
 A = 36 m<sup>2</sup> - disturbance area  
 c = 50% control efficiency (assumed)  
 k = 1.0 PM  
 0.5 PM10  
 0.075 PM2.5

**Results:**

TSP, tpy	3.10E-03		
PM10, tpy	1.55E-03	F21	Wind
PM2.5, tpy	2.32E-04		

F22  
**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Waste Rock Drop at the Waste Rock Storage Pile**

Waste rock dumped at the WRS pile or CTF in year 2, which has the highest annual rate - WR moved in years 0-4 and 8 or 9  
Waste rock drop -at WRS Pad in years 0 to 1.5, and at CTF in years 1.5 to 4 and 8

**Process Information**

Operating Time:	8,760	hr/yr
Process Rate:	349,986	tons/yr - year 2, highest annual rate
Number of Transfers:	1	Mine truck drop to WRS or CTF

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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Pollutant	Emission Factor (lb/ton)	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	0.01	lb/ton	AP-42 Section 11.24, (8/82) Table 11.24-2 (High Moisture Ore - Material Handling & Transfer - All Materials Except Bauxite) Metallic Mineral Processing	0.40	9.59	1.75	20% opacity	0.20	4.79	0.87	Water spray as needed	50%	ARM 17.8.308
PM <sub>10</sub>	0.004	lb/ton	AP-42 Section 11.24 (8/82) Table 11.24-2 (High Moisture Ore - Material Handling & Transfer - All Materials Except Bauxite) Metallic Mineral Processing	0.16	3.84	0.70	20% opacity	0.08	1.92	0.35	Water spray as needed	50%	ARM 17.8.308
PM <sub>2.5</sub>	0.004	lb/ton	AP-42 Section 11.24 (8/82) Table 11.24-2 (High Moisture Ore - Material Handling & Transfer - All Materials Except Bauxite) Metallic Mineral Processing	0.16	3.84	0.70	20% opacity	0.08	1.92	0.35	Water spray as needed	50%	ARM 17.8.308

**NO PM2.5 Ratio**

Uncontrolled Emissions Calculations:

$$PM = (0.01 \text{ lb/ton})(349,986 \text{ tons/year})(1 \text{ transfers})(1 \text{ ton}/2000 \text{ lb}) = 1.75 \text{ tpy}$$

$$PM_{10} = (0.004 \text{ lb/ton})(349,986 \text{ tons/year})(1 \text{ transfers})(1 \text{ ton}/2000 \text{ lb}) = 0.70 \text{ tpy}$$

$$PM_{2.5} = (0.004 \text{ lb/ton})(349,986 \text{ tons/year})(1 \text{ transfers})(1 \text{ ton}/2000 \text{ lb}) = 0.70 \text{ tpy}$$

Controlled Emissions Calculations

$$PM = (0.01 \text{ lb/ton})(349,986 \text{ tons/year})(1 \text{ transfers})(1 \text{ ton}/2000 \text{ lb})(1-0.50) = 0.87 \text{ tpy}$$

$$PM_{10} = (0.004 \text{ lb/ton})(349,986 \text{ tons/year})(1 \text{ transfers})(1 \text{ ton}/2000 \text{ lb})(1-0.50) = 0.35 \text{ tpy}$$

$$PM_{2.5} = (0.004 \text{ lb/ton})(349,986 \text{ tons/year})(1 \text{ transfers})(1 \text{ ton}/2000 \text{ lb})(1-0.50) = 0.35 \text{ tpy}$$

F23  
 Air Emissions Calculations  
 Tintina Montana Inc. Black Butte Copper Project

Temporary waste rock storage (WRS) (Table 3-5, 3-13, 3.4.1)

Operations	Conversions
24 hr/day	43,560 ft <sup>2</sup> / acre
365 days/year	0.3048 m / ft
1 material pile disturbances/hr	453.593 g / lb
24 disturbances/day (year 1 - 2)	2000 lb / ton
36 m <sup>2</sup> , disturbance area	
0.01 acre, disturbance area	
30 ft, max pile height	
820 ft, length	
591 ft, width	
50% dust control efficiency by water spray as needed	

Data Sets Used to Estimate Emissions

Meteorological data was collected near the proposed minesite from mid-2012 through 4th quarter 2017. Year 2013 maximum 1-hour average windspeed recorded per day was used for these calculations because the highest hourly windspeed was recorded that year (Table 1 below). Year 2016 maximum 1-hour average windspeed recorded per day was used for these calculations because it is the most recent complete year of data available for the site (Table 2 below). Table 3 below compares the daily erosion potential (P) between the 2013 and 2016 calculated erosion potential and lists the highest of the two values as an estimate of wind erosion for that day.

Assumptions:

- Assumes flat pile, such that the height to base ratio is less than 0.2:  
 height to base (shortest length) ratio: 0.05
- Fastest mile of wind,  $u_{10}^*$  = 1.35 \* annual maximum 1-hour average wind speed (assumption based on industry convention and a conservative approach - see Wind Conv. (2) worksheet)
- Friction velocity,  $u^*$  = 0.053 \*  $u_{10}^*$  (Eqn. 4 from AP-42 Ch. 13.2.5)
- Threshold friction velocity,  $u_t^*$  = 1.12 m/s waste rock storage (assume surface similar to uncrusted coal pile from Table 13.2.5-2)
- N = 8,750 number of disturbances per year  
 36 m<sup>2</sup>/disturbance

Emissions Potential Calculations:

$P = [58 (u^* - u_t^*)^2 + 25 (u^* - u_t^*)]$  Eq. 3 from AP-42 Ch. 13.2.5-5

Where:  
 P = erosion potential, g/m<sup>2</sup>/disturbance event - P is calculated for each calendar day (as P<sub>daily</sub>) in year 2013 (Table 1) and year 2016 (Table 2). Table 3 lists the largest P<sub>daily</sub> calculated for that calendar day between Tables 1 and 2.  
 $u^*$  = friction velocity, m/s - maximum daily 1-hour average wind speeds for year 2013 and year 2016 were used to determine  $u^*$  for each day of the year according to assumptions listed above  
 $u_t^*$  = 1.12 threshold friction velocity for pile, m/s (uncrusted coal pile, Table 13.2.5-2)

$P_{\text{annual}} [g / (m^2 \cdot \text{year})] = \frac{\text{day } 365}{n = \text{day } 1} P_{\text{daily}} [g / (m^2 \cdot \text{event})] * 23.9716438356164 \text{ hr/day} * 0.99881\text{E} - 40.48 \text{ g} / (m^2 \cdot \text{year})$  (from the bottom of Table 3 below)

Emissions Calculations:

$ER = P_{\text{annual}} * A * c * k$

Where:  
 ER = emission rate for each pollutant, ton/yr  
 $P_{\text{annual}} = 40.48 \text{ g} / (m^2 \cdot \text{year})$  - emission potential for a conservatively worst case year (see above)  
 0.089 lb / (m<sup>2</sup>·year)  
 4.46E-05 ton / (m<sup>2</sup>·year)  
 A = 36 m<sup>2</sup> - disturbance area  
 c = 50% control efficiency (assumed)  
 k = 1.0 PM particle size multiplier, pg. 13.2.5-3: PM = 1.0, PM10 = 0.5, PM2.5 = 0.075  
 0.5 PM10  
 0.075 PM2.5

Results:

TSP, tpy	8.03E-04
PM10, tpy	4.02E-04
PM2.5, tpy	6.02E-05

F23 Wind

F24  
**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Waste Rock Transfer from WRS pile to CTF**

Waste rock is moved from the WRS pile to the CTF and used to build truck roads into the CTF in year 2-3

Process Information	
Operating Time:	8,760 hr/yr
Process Rate:	278,649 tons/yr - year 3, highest annual rate
Number of Transfers:	2 Waste rock drop into truck, then drop into CTF

Non-Criteria Pollutant Emission Limits	
opacity	<20%

Pollutant	Emission Factor (lb/ton)	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	0.01	lb/ton	AP-42 Section 11.24, (8/82) Table 11.24-2 (High Moisture Ore - Material Handling & Transfer - All Materials Except Bauxite) Metallic Mineral Processing	0.64	15.27	2.79	20% opacity	0.318	7.63	1.39	Water spray as needed	50%	ARM 17.8.308
PM <sub>10</sub>	0.004	lb/ton	AP-42 Section 11.24 (8/82) Table 11.24-2 (High Moisture Ore - Material Handling & Transfer - All Materials Except Bauxite) Metallic Mineral Processing	0.25	6.11	1.11	20% opacity	0.127	3.05	0.56	Water spray as needed	50%	ARM 17.8.308
PM <sub>2.5</sub>	0.004	lb/ton	AP-42 Section 11.24 (8/82) Table 11.24-2 (High Moisture Ore - Material Handling & Transfer - All Materials Except Bauxite) Metallic Mineral Processing	0.25	6.11	1.11	20% opacity	0.127	3.05	0.56	Water spray as needed	50%	ARM 17.8.308

NO PM2.5 Ratio

Uncontrolled Emissions Calculations:

$$PM = (0.01 \text{ lb/ton})(278,649 \text{ tons/year})(2 \text{ transfers})(1 \text{ ton}/2000 \text{ lb}) = 2.79 \text{ tpy}$$

$$PM_{10} = (0.004 \text{ lb/ton})(278,649 \text{ tons/year})(2 \text{ transfers})(1 \text{ ton}/2000 \text{ lb}) = 1.11 \text{ tpy}$$

$$PM_{2.5} = (0.004 \text{ lb/ton})(278,649 \text{ tons/year})(2 \text{ transfers})(1 \text{ ton}/2000 \text{ lb}) = 1.11 \text{ tpy}$$

Controlled Emissions Calculations

$$PM = (0.01 \text{ lb/ton})(278,649 \text{ tons/year})(2 \text{ transfers})(1 \text{ ton}/2000 \text{ lb})(1-0.50) = 1.39 \text{ tpy}$$

$$PM_{10} = (0.004 \text{ lb/ton})(278,649 \text{ tons/year})(2 \text{ transfers})(1 \text{ ton}/2000 \text{ lb})(1-0.50) = 0.56 \text{ tpy}$$

$$PM_{2.5} = (0.004 \text{ lb/ton})(278,649 \text{ tons/year})(2 \text{ transfers})(1 \text{ ton}/2000 \text{ lb})(1-0.50) = 0.56 \text{ tpy}$$

F25

**Air Emissions Calculations**  
**Tintina Montana Inc. Black Butte Copper Project**

**Reclamation of WRS pad with N Reclamation stockpile and Soil Stockpiles**  
 The WRS pad is to be reclaimed in year 3

**Process Information**

Process Rate:	204,655	tons/yr
Operating Time:	365	days/yr
Operating Time:	12	hr/day
Process Rate:	46.72	tons/hr
Number of Transfers:	2	load + dump

**Non-Criteria Pollutant Emission Limits**

opacity	<20%
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Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	see below - 11.792 lb/hr and 0.00252 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.75	9.06	1.65	20% opacity	0.75	9.06	1.65	None		ARM 17.8.308
PM <sub>10</sub>	see below - 2.451 lb/hr and 0.00119 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.22	2.63	0.48	20% opacity	0.22	2.63	0.48	None		ARM 17.8.308
PM <sub>2.5</sub>	see below - 1.238 lb/hr and 0.00018 lb/ton	--	AP-42 Section 11.9, (10/98) Western Surface Coal Mining Table 11.9-1 & -3 and AP-42 Section 13.2.4, (11/06) Aggregate Handling and Storage Piles as referenced by AP-42 Section 13.2.3 (1/95) Heavy Construction Operations Table 13.2.3-1	0.07	0.86	0.16	20% opacity	0.07	0.86	0.16	None		ARM 17.8.308

Assume: Topsoil and subsoil stripping is equivalent to bulldozing overburden in Table 11.9-1 per Table 13.2.3-1

Assume: PM = TSP where no other PM data are available

Assume: Each ton of material moved goes through two drops - one into a truck, and one into a pile.

**Uncontrolled Emissions Calculations:**

$$PM = (11.792 \text{ lb/hr}) + (0.00252 \text{ lb/ton}) * (47 \text{ tons/hr}) * (2 \text{ drops}) = 0.75 \text{ lb/hr}$$

$$PM = (0.75 \text{ lb/hr}) * (12 \text{ hr/day}) = 9.06 \text{ lb/day}$$

$$PM = [(11.792 \text{ lb/hr}) * (12 \text{ hr/day}) * (365 \text{ days/yr}) + (0.00252 \text{ lb/ton}) * (204,655 \text{ tons/yr}) * (2 \text{ drops})] / [2,000 \text{ lb/ton}] = 1.65 \text{ tpy}$$

$$PM_{10} = (2.451 \text{ lb/hr}) + (0.00119 \text{ lb/ton}) * (0.47 \text{ tons/hr}) * (2 \text{ drops}) = 0.22 \text{ lb/hr}$$

$$PM_{10} = (0.22 \text{ lb/hr}) * (12 \text{ hr/day}) = 2.63 \text{ lb/day}$$

$$PM_{10} = [(2.451 \text{ lb/hr}) * (12 \text{ hr/day}) * (365 \text{ days/yr}) + (0.00119 \text{ lb/ton}) * (204,655 \text{ tons/yr}) * (2 \text{ drops})] / [2,000 \text{ lb/ton}] = 0.48 \text{ tpy}$$

$$PM_{2.5} = (1.238 \text{ lb/hr}) + (0.00018 \text{ lb/ton}) * (0.47 \text{ tons/hr}) * (2 \text{ drops}) = 0.07 \text{ lb/hr}$$

$$PM_{2.5} = (0.07 \text{ lb/hr}) * (12 \text{ hr/day}) = 0.86 \text{ lb/day}$$

$$PM_{2.5} = [(1.238 \text{ lb/hr}) * (12 \text{ hr/day}) * (365 \text{ days/yr}) + (0.00018 \text{ lb/ton}) * (204,655 \text{ tons/yr}) * (2 \text{ drops})] / [2,000 \text{ lb/ton}] = 0.16 \text{ tpy}$$

**PM Emission Factor Calculations:**

$$EF_{PM_{PM10}/PM_{2.5}} = EF \text{ for topsoil removal (bulldozing of overburden, Table 11.9-1)} + 2 * EF \text{ for truck load and dump of material (Section 13.2.4)}$$

silt %, s = 6.9 (Table 11.9-3, bulldozing overburden) - this value was used instead of the road silt value for a more conservative estimate  
 Moisture %, M = 3.4 (Table 13.2.4-1, Western surface coal mining exposed ground mean moisture content)

**Emission factor calculations for topsoil removal:**

Table 11.9-1 provides equations to calculate EF in terms of lb/hr for TSP and PM<sub>15</sub>, with a scaling factor for PM<sub>10</sub> as a function of PM<sub>15</sub>.

$$\text{Topsoil removal } EF_{PM} = EF_{TSP} \text{ for topsoil removal by bulldozing (Table 11.9-1 for overburden bulldozing)} = 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

**Topsoil removal EF<sub>PM</sub> = 11.792 lb/hr**

$$\text{Topsoil removal } EF_{PM10} = 0.75 * EF_{PM15} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.75 * 1.0 * (s)^{1.5} / (M)^{1.4} \text{ lb/hr}$$

**Topsoil removal EF<sub>PM10</sub> = 2.451 lb/hr**

$$\text{Topsoil removal } EF_{PM2.5} = 0.105 * EF_{TSP} \text{ (Table 11.9-1 for overburden bulldozing)} = 0.105 * 5.7 * (s)^{1.2} / (M)^{1.3} \text{ lb/hr}$$

**Topsoil removal EF<sub>PM2.5</sub> = 1.238 lb/hr**

**Dozer clearing rate**

Klanfar et al. 2014  
 535 m<sup>3</sup>/hr (Avg.)

**Bulk Density**

Engineering Toolbox  
 Soil, High 1600 kg/m<sup>3</sup>  
 Soil, Low 1200 kg/m<sup>3</sup>  
 Clay, High 2600 kg/m<sup>3</sup>  
 Clay, Low 1800 kg/m<sup>3</sup>  
**Average 1800 kg/m<sup>3</sup>**

**Conversions**

907.185 kg/ton  
 12 hrs/day  
 4380 hrs/yr

$$\text{Topsoil removal } EF_{PM} = EF_{PM} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 11.792 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM</sub> = 0.01111 lb PM / ton**

$$\text{Topsoil removal } EF_{PM10} = EF_{PM10} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 2.451 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM10</sub> = 0.00231 lb PM10 / ton**

$$\text{Topsoil removal } EF_{PM2.5} = EF_{PM2.5} \text{ (lb/hr)} * (1/\text{Dozer clearing rate}) * (1/\text{Avg. Bulk Density}) * (907.185 \text{ kg/ton}) = 1.238 \text{ lb/hr} * (\text{hr}/535 \text{ m}^3) * (\text{m}^3/1800 \text{ kg}) * (907.185 \text{ kg/ton})$$

**Topsoil removal EF<sub>PM2.5</sub> = 0.00117 lb PM2.5 / ton**



**Emission factor calculations for truck loading and dumping (section 13.2.4)**

$$E = k * (0.0032) * (U/5)^{1.3} / (M/2)^{1.4} \text{ lb/ton}$$

Equation (1), section 13.2.4, emission factor for drop operations

k = 0.74 < 30 um PM  
0.35 < 10 um PM  
0.053 < 2.5 um PM  
U = 9.3 mean windspeed, mph (standard windspeed for MT per MDEQ)  
M = 3.4 material moisture content, %

**Truck load and dump EF<sub>PM</sub> = 0.00252 lb/ton**

**Truck load and dump EF<sub>PM10</sub> = 0.00119 lb/ton**

**Truck load and dump EF<sub>PM2.5</sub> = 0.00018 lb/ton**

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 Air Emissions Calculations  
 Tintina Montana Inc. Black Butte Copper Project

Light plants - emissions from each 8 kW light plant on this sheet

Process Information

Process Rate:	8760	hr/yr
Engine power output:	14	hp - ESTIMATE
Sulfur Content	0.015	percent
No. of light plants	11	

Non-Criteria Pollutant Emission Limits

opacity	<20%
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Tier 2 Engine - 40 CFR 89.112 (no Tier 3 for engines of this size - there is a Tier 4 rating for this size)

Power Rating range: 8 < kW < 19 (10.7 < hp < 25.5)

Emission Standards

Non-methane hydrocarbon + NOx:	7.5 g/kW-hr	1.23E-02 lb/hp-hr
CO:	6.6 g/kW-hr	1.09E-02 lb/hp-hr
PM:	0.80 g/kW-hr	1.32E-03 lb/hp-hr

AP-42, Chapter 3.3, Gasoline and Diesel Industrial Engines EF (T

PM <sub>10</sub>	2.20E-03 lb/hp-hr
SOx	2.05E-03 lb/hp-hr
NOx	0.031 lb/hp-hr
CO	6.68E-03 lb/hp-hr
VOC	2.47E-03 lb/hp-hr (TOC exhaust)

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions		
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)
PM	2.20E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.34	8.13	1.48	20% opacity	0.34	8.13	1.48
PM <sub>10</sub>	2.20E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.34	8.13	1.48	20% opacity	0.34	8.13	1.48
PM <sub>2.5</sub>	2.20E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1; all PM assumed to be < 1 um	0.34	8.13	1.48	20% opacity	0.34	8.13	1.48
Sulfur Dioxide (SO <sub>2</sub> )	1.21E-05	lb/hp-hr	AP-42 Section 3.4, Table 3.4-1 (10/96) Large Stationary Diesel Industrial Engines	0.00	0.04	0.01	not applicable	0.00	0.04	0.008
Nitrogen Oxides (NO <sub>x</sub> )	3.10E-02	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1 - assumes NMHC+NOx is all NOx	4.77	114.58	20.91	not applicable	4.77	114.58	20.91
Carbon Monoxide (CO)	6.68E-03	lb/hp-hr	Tier 3 engine - 40 CFR 89.112 Table 1	1.03	24.69	4.51	not applicable	1.03	24.69	4.51
VOC*	2.47E-03	lb/hp-hr	AP-42 Section 3.3, Table 3.3-1 (10/96) Gasoline and Diesel Industrial Engines	0.38	9.13	1.67	not applicable	0.38	9.13	1.67

\*NOTE: Emission factor for VOC is assumed to be equal to the emission factor for Total Organic Carbon (TOC) in the exhaust. This would be a conservative estimate as not all TOC is VOC.

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Tintina Montana Inc. Black Butte Copper Project  
500-gal Gasoline Storage Tank (double-walled)

TANKS 4.0 Report <!-- function StartUp() { var DataSource=new  
TANKS 4.0.9d  
Emissions Report - Detail Format  
Tank Identification and Physical Characteristics

Identification  
User Identification:500 gal gasoline tank  
City:Great Falls  
State:Montana  
Company:Tintina  
Type of Tank:Horizontal Tank  
Description:500 gal gasoline tank

Meterological Data used in Emissions Calculations: Great Falls, Montana  
(Avg Atmospheric Pressure = 12.88 psia)

Tank Dimensions  
Shell Length (ft):5.00  
Diameter (ft):4.67  
Volume (gallons):500.00  
Turnovers:24.00  
Net Throughput(gal/yr):12,000.00  
Is Tank Heated (y/n):N  
Is Tank Underground (y/n):N

Paint Characteristics  
Shell Color/Shade:White/White  
Shell Condition:Good

Breather Vent Settings  
Vacuum Settings (psig):-0.03  
Pressure Settings (psig)0.03

Daily Liquid Surf.  
Temperature (deg F)Liquid  
Bulk  
Temp Vapor Pressure (psia)Vapor  
Mol. Liquid  
Mass Vapor  
Mass Mol. Basis for Vapor Pressure  
Mixture/ComponentMonthAvg.Min.Max.(deg F) Avg.Min.Max.Weight. Fract.  
Fract. Weight Calculations

Gasoline (RVP 9)All46.4640.7452.1744.77 3.50713.11063.943467.0000  
92.00 Option 4: RVP=9, ASTM Slope=3

#### Annual Emission Calculations

Standing Losses (lb):76.6805  
Vapor Space Volume (cu ft):54.5499  
Vapor Density (lb/cu ft):0.0433  
Vapor Space Expansion Factor:0.1277  
Vented Vapor Saturation Factor:0.6973

Tank Vapor Space Volume:  
Vapor Space Volume (cu ft):54.5499  
Tank Diameter (ft):4.6700  
Effective Diameter (ft):5.4539  
Vapor Space Outage (ft):2.3350  
Tank Shell Length (ft):5.0000

Vapor Density  
Vapor Density (lb/cu ft):0.0433  
Vapor Molecular Weight (lb/lb-mole):67.0000  
Vapor Pressure at Daily Average Liquid  
Surface Temperature (psia):3.5071  
Daily Avg. Liquid Surface Temp. (deg. R):506.1257  
Daily Average Ambient Temp. (deg. F):44.7458  
Ideal Gas Constant R  
(psia cuft / (lb-mol-deg R)):10.731  
Liquid Bulk Temperature (deg. R):504.4358  
Tank Paint Solar Absorptance (Shell):0.1700  
Daily Total Solar Insulation  
Factor (Btu/sqft day):1,264.8497

Vapor Space Expansion Factor  
Vapor Space Expansion Factor:0.1277  
Daily Vapor Temperature Range (deg. R):22.8627  
Daily Vapor Pressure Range (psia):0.8328  
Breather Vent Press. Setting Range(psia):0.0600  
Vapor Pressure at Daily Average Liquid  
Surface Temperature (psia):3.5071  
Vapor Pressure at Daily Minimum Liquid  
Surface Temperature (psia):3.1106  
Vapor Pressure at Daily Maximum Liquid  
Surface Temperature (psia):3.9434  
Daily Avg. Liquid Surface Temp. (deg R):506.1257  
Daily Min. Liquid Surface Temp. (deg R):500.4101  
Daily Max. Liquid Surface Temp. (deg R):511.8414  
Daily Ambient Temp. Range (deg. R):23.3917

Vented Vapor Saturation Factor  
Vented Vapor Saturation Factor:0.6973  
Vapor Pressure at Daily Average Liquid:  
Surface Temperature (psia):3.5071  
Vapor Space Outage (ft):2.3350

Working Losses (lb):67.1351  
Vapor Molecular Weight (lb/lb-mole):67.0000  
Vapor Pressure at Daily Average Liquid  
Surface Temperature (psia):3.5071  
Annual Net Throughput (gal/yr.):12,000.0000  
Annual Turnovers:24.0000  
Turnover Factor:1.0000  
Tank Diameter (ft):4.6700  
Working Loss Product Factor:1.0000

Total Losses (lb):143.8156 = 0.07 tpy

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Tintina Montana Inc. Black Butte Copper Project

**EMISSIONS CALCULATIONS**

Temporary and Portable Propane-fired heater at Portal

Max. Fuel Combustion Rate = 37.80 MMBtu/hr  
Fuel Usage = 3,625.62 10<sup>3</sup> gal/yr  
Hours of Operation = 8,760 hr/yr  
Fuel High Heating Value= 91.33 MMBtu/10<sup>3</sup> gal  
Conversions: 454 grams/lb  
2000 lbs/ton

**Criteria Pollutants (HAPs)**

Pollutant	Emission Factor	Units	Emission Factor Reference	Emissions (lbs/hr)	Emissions (tons/yr)
PM/PM10/PM2.5	0.7	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.29	1.27
NOx	13	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	5.38	23.57
CO	7.5	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	3.10	13.60
VOC	1	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.41	1.81
SO <sub>2</sub>	0.054	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.02	0.098
CO <sub>2</sub>	12500.0	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	5173.55	22660.13
CH <sub>4</sub>	0.2	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.08	0.36
N <sub>2</sub> O	0.9	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	0.37	1.63
Total CO <sub>2</sub> e	12783.2	lb/10 <sup>3</sup> gal	AP-42 Table 1.5-1 (07/08)	5290.76	23173.52

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Air Emissions Calculations

Tintina Montana Inc. Black Butte Copper Project

Road Dust Fugitive Emissions - Non-haul roads, incoming materials, construction phase - Construction Access Road

Road Dust, Mine Operating Year 0 to 1

Process Information

Silt content of road:	4.8% (sand & gravel plant road)
Days with ppt>0.01" *	88 days
	14.2 tons, mean vehicle wt.
	2.5 VMT/day
Dust suppression control efficiency:	50% control
	24 hr/d
	365 day/year
	2000 lb/ton

Non-Criteria Pollutant Emission Limits

opacity	<20%
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Road Criteria - Construction Access Road

Road length	1090 ft
Frequency	6.1 trucks/day
Vehicle Ft Traveled	6649 ft
VMT (1 Way)	1.26 mi
VMT (Round Trip)	2.5 mi

Materials incoming (based on maximum avg weights for Truck Vehicle Classes 2-8, NHTSA GVW for medium and heavy vehicles, 2006)  
Materials incoming 6.1 Trucks per day/1090 feet per trip (2180 feet per round trip)

VMT calculations are based on 365 days per year in "Road dust design values" worksheet

Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	3.94	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	0.4	10	1.8	20% opacity	0.21	4.93	0.90	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>10</sub>	1.00	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	0.1	3	0.5	20% opacity	0.0523	1.26	0.23	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>2.5</sub>	0.10	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	0.0	0.3	0.0	20% opacity	0.00525	0.13	0.023	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308

Emission Factor =  $(k)(s/12)^a(W/3)^b(365-P)/365$  lb/vmt AP-42 Ch 13.2.2 Eqns 1a and 2  
for travel on unpaved surfaces at industrial sites

where:

k = particle size multiplier

= 4.9 for PM (>30 µg/m<sup>3</sup>)

= 1.5 for PM<sub>10</sub>

= 0.15 for PM<sub>2.5</sub>

a = empirical constant

= 0.7 for PM (>30 µg/m<sup>3</sup>)

= 0.9 for PM<sub>10</sub> and PM<sub>2.5</sub>

b = 0.45 for all PM

s = 4.8 surface material silt content, per AP42-Table 13.2.2-1, mean for sand and gravel processing plant road

W = 14.2 tons, mean vehicle weight

P = 88 number of days in year with at least 0.01 inches of precipitation per on-site met station - year 2013 data used as it showed the fewest days with sufficient precipitation

Table 13.2.2-4 Emission Factor for 1980's Vehicle Fleet Exhaust, Brake Wear and Tire Wear

PM 0.00047 lb/vmt

PM<sub>10</sub> 0.00047 lb/vmt

PM<sub>2.5</sub> 0.00036 lb/vmt

Emission Factor Calculations:

	Road dust:	Equipment wear:	Total Particulate EF:
PM Emission factor =	3.94 lb/vmt +	0.00047 lb/vmt =	3.94 lb/vmt
PM <sub>10</sub> Emission factor =	1.00 lb/vmt +	0.00047 lb/vmt =	1.00 lb/vmt
PM <sub>2.5</sub> Emission factor =	0.10 lb/vmt +	0.00036 lb/vmt =	0.10 lb/vmt

F30  
 Air Emissions Calculations  
 Tintina Montana Inc. Black Butte Copper Project  
 Road Dust Fugitive Emissions - Non-haul road fugitives, operations phase - Main Access Road

Road Dust, Mine Operating Year 2 to 15, annual average

Process Information

Silt content of road:	4.8	% (sand & gravel plant road)
Days with ppt>0.01" *	88	days
	13.3	tons, mean vehicle wt.
	16	number of years
	292.6	VMT/day, annual average
Dust suppression control efficiency:	50%	% control
	24	hr/d
	365	day/year
	2000	lb/ton

Road Criteria - Main Access Road

Road length	2342	meters
Frequency	100.6	trucks/day
Vehicle Ft Traveled	235605.2	meters
VMT (1 Way)	146.398	mi
VMT (Round Trip)	292.6	mi

VMT calculations are based on 365 days per year in "Road dust design values" worksheet

Vehicle Type	Vehicles per day	Mean Vehicle Wt (tons)	Note
Concentrate Truck	18	57.5	
Cars/Misc	73	2.25	a
Materials in and out	9.6	14.2	b
<b>Total</b>	<b>100.6</b>		
<b>Aggregate Veh. Wt</b>		<b>13.3</b>	

(a) Based on "Average Vehicle Fleet Weight in Clark County, NV" - February 2006  
 (b) Materials in/our (based on maximum avg weights for Truck Vehicle Classes 2-8, NHTSA GVW for medium and heavy vehicles, 2006)

Non-Criteria Pollutant Emission Limits

opacity	<20%
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Pollutant	Emission Factor	Units	Source	Uncontrolled Emissions			Enforceable Control Limit	PTE Emissions			Control Method (Practice or Equipment)	Control Efficiency (percent)	Comments
				Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)		Hourly (lb/hr)	Daily (lb/day)	Annual (tpy)			
PM	3.83	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	46.7	1,120	204.4	20% opacity	23.3	560.0	102.2	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>10</sub>	0.98	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	11.9	285.5	52.1	20% opacity	5.948	142.8	26.1	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308
PM <sub>2.5</sub>	0.10	lb/VMT	AP-42 Section 13.2.2, (11/06) Unpaved Roads	1.19	28.6	5.23	20% opacity	0.597	14.3	2.61	Water spray and/or chemical dust suppressant as necessary	50%	ARM 17.8.308

Emission Factor =  $(k)(s/12)^a(W/3)^b(365-P)/365$  lb/vmt for travel on unpaved surfaces at industrial sites  
 AP-42 Ch 13.2.2 Eqns 1a and 2

where:

k = particle size multiplier

= 4.9 for PM (>30 µg/m<sup>3</sup>)

= 1.5 for PM<sub>10</sub>

= 0.15 for PM<sub>2.5</sub>

a = empirical constant

= 0.7 for PM (>30 µg/m<sup>3</sup>)

= 0.9 for PM<sub>10</sub> and PM<sub>2.5</sub>

b = 0.45 for all PM

s = 4.8 surface material silt content, per AP42-Table 13.2.2-1, mean for sand and gravel processing plant road

W = 13 tons, mean vehicle weight

P = 88 number of days in year with at least 0.01 inches of precipitation per on-site met station - year 2013 data used as it showed the fewest days with sufficient precipitation

Table 13.2.2-4 Emission Factor for 1980's Vehicle Fleet Exhaust, Brake Wear and Tire Wear

PM 0.00047 lb/vmt

PM<sub>10</sub> 0.00047 lb/vmt

PM<sub>2.5</sub> 0.00036 lb/vmt

Emission Factor Calculations:	Road dust:	Equipment wear:	Total Particulate EF:
PM Emission factor =	3.83 lb/vmt +	0.00047 lb/vmt =	3.83 lb/vmt
PM <sub>10</sub> Emission factor =	0.98 lb/vmt +	0.00047 lb/vmt =	0.98 lb/vmt
PM <sub>2.5</sub> Emission factor =	0.10 lb/vmt +	0.00036 lb/vmt =	0.10 lb/vmt

### Wind Data for Pile Emissions Calculations

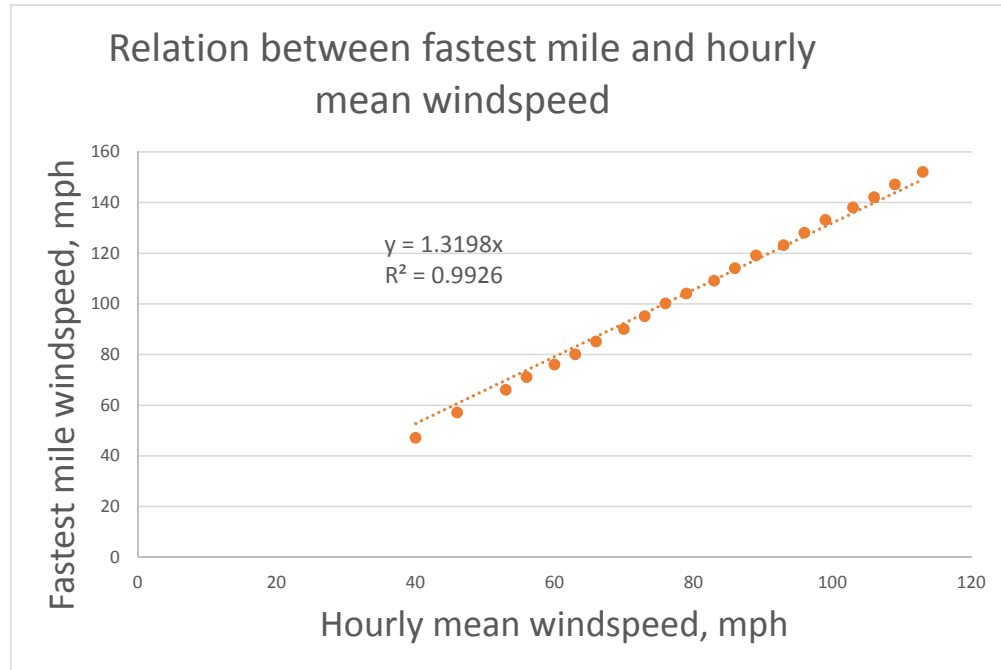
Adapted from Annex L: Wind Speed Conversions (Normative) in *TIA Standard Structural Standard for Antenna Supporting Structures and Antennas - Addendum 2*, ANSI/TIA-222-G-2-2009, December 2009

Fastest mile, mph	Hourly mean, mph	Ratio of fastest mile:hourly mean
47	40	1.18
57	46	1.24
66	53	1.25
71	56	1.27
76	60	1.27
80	63	1.27
85	66	1.29
90	70	1.29
95	73	1.30
100	76	1.32
104	79	1.32
109	83	1.31
114	86	1.33
119	89	1.34
123	93	1.32
128	96	1.33
133	99	1.34
138	103	1.34
142	106	1.34
147	109	1.35
152	113	1.35

Average ratio: 1.30

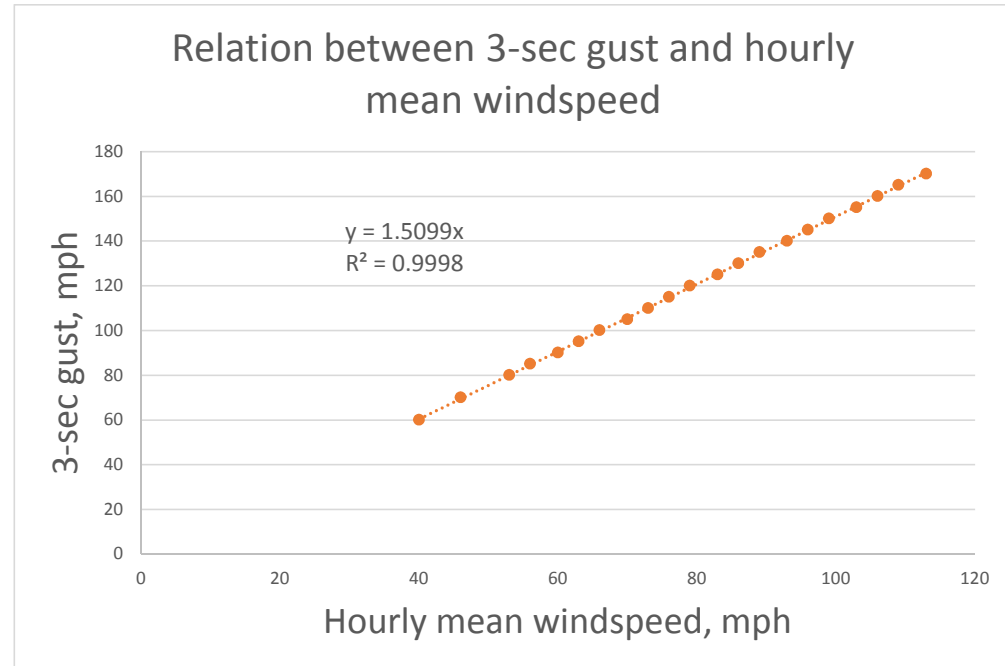
Max ratio: 1.35

Min ratio: 1.18



3-sec gust, mph	Hourly mean, mph	of fastest mile:hourly mean
60	40	1.50
70	46	1.52
80	53	1.51
85	56	1.52
90	60	1.50
95	63	1.51
100	66	1.52
105	70	1.50
110	73	1.51
115	76	1.51
120	79	1.52
125	83	1.51
130	86	1.51
135	89	1.52
140	93	1.51
145	96	1.51
150	99	1.52
155	103	1.50
160	106	1.51
165	109	1.51
170	113	1.50

Average ratio: 1.51  
 Max ratio: 1.52  
 Min ratio: 1.50



Tintina data:

	u+10 max 1-hr (m/s) (=	avg 10m WS (m/s)	1.3 * max avg WS)	u*
2012	15.6	20.28	1.07	
2013	16.5	21.45	1.14	
2014	15.6	20.28	1.07	
2015	14.9	19.37	1.03	
2016	15.4	20.02	1.06	
2017	15.7	20.41	1.08	
	maximum:		1.14	

Assumptions:  $u_{10}^+ = 1.3$  \* annual maximum 1-hour average wind speed (industry convention)















**APPENDIX D: RACT/BACT/LAER DATABASE SEARCH  
RESULTS**

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Process Type Code: 90.021 - Lime/Limestone Handling/Kilns/Storage/Manufacturing  
 01/01/2007 - 12/31/2017  
 Only Mineral Process or Storage results included in table (in addition to state actions)

RBLC-ID	Facility Name	Process	Standardized Emission Limits		Controls	% Efficiency	Date	PSD?
			FPM	FPM-10				
IN-0167	MAGNETATION LLC	MIXING AREA MATERIAL HANDLING SYSTEM	0.002 gr/dscf	0.002 gr/dscf	BAGHOUSE	---	4/16/2013	PSD
	GRAYMONT INDIAN CREEK	HYDRATOR	0.01 GR/ACF	0.01 GR/ACF	FABRIC FILTER DUST COLLECTOR	---	6/21/2013	non PSD
	GRAYMONT INDIAN CREEK	HYDRATE PRODUCT HANDLING AND STORAGE	0.01 GR/DSCF	0.01 GR/DSCF	FABRIC FILTER DUST COLLECTOR	---	6/21/2013	non PSD
IN-0185	MAG PELLETT LLC	MIXING AREA MATERIAL HANDLING SYSTEM	0.002 gr/dscf	---	FABRIC FILTER	---	4/24/2014	PSD
	GRAYMONT INDIAN CREEK	LIME LOADOUT SPOUTS	0.01 GR/DSCF	0.01 GR/DSCF	FABRIC FILTER DUST COLLECTOR	---	8/15/2017	non PSD
	GRAYMONT INDIAN CREEK	LIME KILN DUST SILO	0.01 GR/DSCF	0.01 GR/DSCF	FABRIC FILTER DUST COLLECTOR	---	8/15/2017	non PSD



## **APPENDIX E: MODELING FILES**

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# Non-Road Fugitive Source Key

## Source Directory

This indicates the individual Emission Inventory source associated with each modeled source.

Model Source ID	Associated Emissions Inventory		
	Wind Source	Dozer Source	Transfer Source
CTF_T_1 to CTF_T_4		F6 F10 F16	F6_CTF_T F10_CTF_T F16_CTF_T F24_T_CTF
CUIPLE_1	F21		F20_T_CU
CUIPLE_T_1		F13 F16	F13_CU_T F16_CU_T
CWP_T_1 to CWP_T_3		F13 F16	F13_CWP_T F16_CWP_T
DRAIN_CTF		F16	
DRAIN_PWP		F16	
MILL_T_1 to MILL_T_4		F13 F16	F13_MILL_T F16_MILL_T
NCWR_T_1 to NCWR_T_4		F8 F16	F8_T_NCWR
NPILE	F14		F13_T_NS

Model Source ID	Associated Emissions Inventory		
	Wind Source	Dozer Source	Transfer Source
POWDER		F16	
PORTAL_T_1 to PORTAL_T_4		F8 F16	F8_T_PP F16_PP_T
PWP_T_1 to PWP_T_4		F8 F16	F8_T_PWP F16_PWP_T
SPILE	F11		F10_T_SS
SUBS	F18		F16_T_SSOIL
TEMP	F7		F6_T_TEMP F8_TEMP_T
TOPS	F17		F16_T_TSOIL
WRS_1 to WRS_3	F23		F22_T_WRS
WRS_T_1 to WRS_T_3		F6 F13 F16	F6_WRS_T F13_WRS_T F16_WRS_T F24_WRS_T

## Non-Road Fugitive Source Key

### Expanded Source Directory

Model Source ID: The volume source ID in the model containing all of the associated individual emission sources  
 EI Section: Section for each associated emission calculation in the Emissions Inventory  
 EI Activity ID: Individual emission calculation ID listed in the EI section or in the "Emission by Activity" page of the EI  
 Source Description: Description of the individual emissions calculation or the modeled source

Model Source ID	Emissions Inventory Section	EI Activity ID	Source Description
CTF_T_1 to CTF_T_4	CTF Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to and from haul trucks		
	F6	F6_CTF_T	Material transfer to Temporary Stockpile - CTF to Truck
	F10	F10_CTF_T	Material transfer to South Stockpile - CTF to Truck
	F16	F16_CTF_T	Soil and topsoil removal - CTF to Truck
	F24	F24_T_CTF	Waste Rock Transfer from WRS to CTF - Truck to CTF
	F6, F10, F16	CTF_1	Fugitive excavation, soil removal, and ground disturbance emissions for sources
	F6, F10, F16	CTF_2	Fugitive excavation, soil removal, and ground disturbance emissions for sources
	F6, F10, F16	CTF_3	Fugitive excavation, soil removal, and ground disturbance emissions for sources
F6, F10, F16	CTF_4	Fugitive excavation, soil removal, and ground disturbance emissions for sources	
CUIPIL_1	Cu Ore Pile Activities - Wind erosion and pile disturbance; Truck transfer to pile		
	F21	F21	Copper-enriched rock stockpile (mill feed) Wind Erosion
	F20	F20_T_CU	Copper-enriched rock drop to stockpile, MOY 2 to 3
CUIPIL_T_1	Cu Ore Pile Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to haul trucks		
	F13	F13_CU_T	Material transfer to North Stockpile - Cu-Enriched Ore Stockpile to Truck
	F16	F16_CU_T	Soil and topsoil removal - Cu-Enriched Ore Stockpile to Truck
	F13, F16	CUIPIL_1	Excavation and topsoil/subsoil removal
CWP_T_1 to CWP_T_3	CWP Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to haul trucks		
	F_13	F13_CWP_T	Material transfer to North Stockpile - CWP to Truck
	F_16	F16_CWP_T	Soil and topsoil removal - CWP to Truck
	F13, F16	CWP_1	Fugitive excavation, soil removal, and ground disturbance emissions for sources
	F13, F16	CWP_2	Fugitive excavation, soil removal, and ground disturbance emissions for sources
F13, F16	CWP_3	Fugitive excavation, soil removal, and ground disturbance emissions for sources	
DRAIN_CTF	F16	DRAIN_CTF	Fugitive excavation, soil removal, and ground disturbance emissions for sources
DRAIN_PWP	F16	DRAIN_PWP	Fugitive excavation, soil removal, and ground disturbance emissions for sources
MILL_T_1 to MILL_T_4	Mill Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to haul trucks		
	F13	F13_MILL_T	Material transfer to North Stockpile - Mill Pad to Truck
	F16	F16_MILL_T	Soil and topsoil removal - Mill Pad to Truck
	F13, F16	MILL_1	Fugitive excavation, soil removal, and ground disturbance emissions for sources
	F13, F16	MILL_2	Fugitive excavation, soil removal, and ground disturbance emissions for sources
	F13, F16	MILL_3	Fugitive excavation, soil removal, and ground disturbance emissions for sources
F13, F16	MILL_4	Fugitive excavation, soil removal, and ground disturbance emissions for sources	
NCWR_T_1 to NCWR_T_4	NCWR Activities - excavation and ground disturbance; soil and topsoil removal; material transfers from haul trucks		
	F8	F8_T_NCWR	Embankment Construction, Mine Operating - Truck to NCWR
	F8, F16	NCWR_1	Fugitive excavation, soil removal, and ground disturbance emissions for sources
	F8, F16	NCWR_2	Fugitive excavation, soil removal, and ground disturbance emissions for sources
	F8, F16	NCWR_3	Fugitive excavation, soil removal, and ground disturbance emissions for sources
F8, F16	NCWR_4	Fugitive excavation, soil removal, and ground disturbance emissions for sources	

Model Source ID	Emissions Inventory Section	EI Activity ID	Source Description
NPILE	North Stockpile Activities - wind erosion and pile disturbance; truck transfer to pile		
	F14	F14	Excess reclamation stockpile (North) Wind Erosion
	F13	F13_T_NS	Material transfer to North Stockpile - Truck to North Stockpile
POWDER	F16	POWDER	Fugitive excavation, soil removal, and ground disturbance emissions for sources
PORTAL_T_1 to PORTAL_T_4	Portal Pad Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to and from haul trucks		
	F8	F8_T_PP	Embankment Construction, Mine Operating - Truck to Portal Pad
	F16	F16_PP_T	Soil and topsoil removal - Portal Pad to Truck
	F8, F16	PORTAL_1	Fugitive excavation, soil removal, and ground disturbance emissions for sources
	F8, F16	PORTAL_2	Fugitive excavation, soil removal, and ground disturbance emissions for sources
	F8, F16	PORTAL_3	Fugitive excavation, soil removal, and ground disturbance emissions for sources
	F8, F16	PORTAL_4	Fugitive excavation, soil removal, and ground disturbance emissions for sources
PWP_T_1 to PWP_T_4	PWP Activities - excavation and ground disturbance; soil and topsoil removal; material transfers from haul trucks		
	F8	F8_T_PWP	Embankment Construction, Mine Operating - Truck to PWP
	F16	F16_PWP_T	Soil and topsoil removal - PWP to Truck
	F8, F16	PWP_1	Fugitive excavation, soil removal, and ground disturbance emissions for sources F8, F16
	F8, F16	PWP_2	Fugitive excavation, soil removal, and ground disturbance emissions for sources F8, F16
	F8, F16	PWP_3	Fugitive excavation, soil removal, and ground disturbance emissions for sources F8, F16
	F8, F16	PWP_4	Fugitive excavation, soil removal, and ground disturbance emissions for sources F8, F16
SPILE	South Stockpile Activities - wind erosion and pile disturbance; truck transfer to pile		
	F11	F11	Excess reclamation stockpile (South) Wind Erosion
	F10	F10_T_SS	Material transfer to South Stockpile - Truck to South Stockpile
SUBS	Subsoil Stockpile Activities - wind erosion and pile disturbance; truck transfer to pile		
	F18	F18	Subsoil pile Wind Erosion
	F16	F16_T_SSOIL	Soil and topsoil removal - Truck to Subsoil Pile
TEMP	Temporary construction stockpile - wind erosion and pile disturbance; transfers to and from haul trucks		
	F7	F7	Temporary construction stockpile Wind Erosion
	F6	F6_T_TEMP	Material transfer to Temporary Stockpile - Truck to Temp Const Stockpile
	F8	F8_TEMP_T	Embankment Construction, Mine Operating - Temp Const Stockpile to Truck
TOPS	Topsoil Stockpile Activities - wind erosion and pile disturbance; truck transfer to pile		
	F17	F17	Topsoil pile Wind Erosion
	F16	F16_T_TSOIL	Soil and topsoil removal - Truck to Topsoil Pile
WRS_1 to WRS_3	WRS - Wind erosion and pile disturbance; Truck transfer to pile		
	F23	F23	Temporary waste rock storage (WRS) Wind Erosion
	F22	F22_T_WRS	Waste Rock Drop -at WRS Pad, MOY 0 to 1.5, at CTF, MOY 1.5 to 4 and 8
WRS_T_1 to WRS_T_3	WRS Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to haul trucks		
	F6	F6_WRS_T	Material transfer to Temporary Stockpile - WRS to Truck
	F13	F13_WRS_T	Material transfer to North Stockpile - WRS Pad to Truck
	F16	F16_WRS_T	Soil and topsoil removal - WRS Pad to Truck
	F24	F24_WRS_T	Waste Rock Transfer from WRS to CTF - WRS to Truck
	F6, F13, F16	WRS_1	Fugitive excavation, soil removal, and ground disturbance emissions for sources F6, F13, F16
	F6, F13, F16	WRS_2	Fugitive excavation, soil removal, and ground disturbance emissions for sources F6, F13, F16
	F6, F13, F16	WRS_3	Fugitive excavation, soil removal, and ground disturbance emissions for sources F6, F13, F16

## Haul Road Source Notations

### Road Activity ID Key

Create Activity ID

#### Mine Phase

- D Development
- P Production
- C Closure

#### Mine Process

Development

- A Soil and Subsoil Stripping and Hauling all Facilities
- B Embankment Construction
- C Excavated Material to North Reclamation Stockpile
- D Excavated Material to South Reclamation Stockpile
- E Waste Rock: Portal to WRS
- F Waste Rock: WRS to CTF
- G North Reclamation stockpile to WRS Pad
- H Soils Replaced from Soil Stockpiles to WRS Pad

Production

- I Waste Rock: Portal to CTF
- J Ore: Portal to Cu-Enriched Ore Stockpile
- K Ore: Portal to Crusher

#### Mine Area

- T CTF
- O Cu-Enriched Ore Stockpile
- C CWP
- M Mill Pad
- N NCWR
- 2 Portal Pad
- P PWP
- W WRS Pad

### Road Activity ID Catalog

Phases, Processes, and Areas match the Emissions Inventory page "Road Dust Design Values"

Road Activity ID	Mine Phase	Mine Process	Mine Area	Phase	Process	Area
DA2	Development	Soil and Subsoil Stripping and Hauling all Facilities	Portal Pad	D	A	2
DAC	Development		CWP	D	A	C
DAO	Development		Cu-Enriched Ore Stockpile	D	A	O
DAW	Development		WRS Pad	D	A	W
DAM	Development		Mill Pad	D	A	M
DAP	Development		PWP	D	A	P
DAT	Development		CTF	D	A	T
DB2	Development	Embankment Construction	Portal Pad	D	B	2
DBP	Development		PWP	D	B	P
DBN	Development		NCWR	D	B	N
DCC	Development	Excavated Material to North Reclamation Stockpile	CWP	D	C	C
DCO	Development		Cu-Enriched Ore Stockpile	D	C	O
DCW	Development		WRS Pad	D	C	W
DCM	Development		Mill Pad	D	C	M
DDT	Development	Excavated Material to South Reclamation Stockpile	CTF	D	D	T
DF2	Development	Waste Rock: Portal to WRS	Portal Pad	D	F	2
DBN	Development	Embankment Construction	NCWR	D	B	N
DDT	Development	Excavated Material to South Reclamation Stockpile	CTF	D	D	T
PIT	Production	Waste Rock: Portal to CTF	CTF	P	I	T
DFT	Development	Waste Rock: WRS to CTF	CTF	D	F	T
DGW	Development	North Reclamation stockpile to WRS Pad		D	G	W
DHW	Development	Soils Replaced from Soil Stockpiles to WRS Pad	WRS Pad	D	H	W
PJO	Production	Ore: Portal to Cu-Enriched Ore Stockpile	Cu-Enriched Ore Stockpile	P	J	O
PKX	Production	Ore: Portal to Crusher	Crusher	P	K	X
PIT	Production	Waste Rock: Portal to CTF	CTF	P	I	T

## Haul Road Segments

Road Segment ID	Road Segment Description
Rd4	Mill road (north of pad)
Rd5	Portal to west end of Portal Pad
Rd6	CTF Road: N. Mill Road to PWP Road
Rd7	CTF Road: Middle CTF to junction soil stockpile road
Rd8	CTF road
Rd9	Truck road to soil stockpiles/PWP
Rd10	CTF to NCWR
<b>North Mill Road Segments</b>	
Rd16	North Mill Road: WRS connector to CTF
Rd17	North Mill Road: WRS connector to Portal Pad
Rd18	North Mill Road: WRS connector to N. Reclamation connector
Rd19	North Mill Road: Cu-enriched SP connector to Portal Pad
Rd20	North Mill Road: CU-enriched SP connector road to CTF road
<b>North Mill Road Connectors to Facilities</b>	
Rd23	North Mill road connector to WRS Pad
Rd24	North Mill road connector to Cu-Enriched stockpile
Rd25	North Mill road connector to N. Reclamation stockpile
<b>Ancillary Road Connectors to Facilities</b>	
Rd_DCC	North Mill road connector to CWP
Rd_DBP	PWP Development Road
Rd_DAC	CTF Road: CTF to PWP junction
Rd_DCO	North Mill road: Cu connector to N. Reclaim connector road
Rd_DCM	Mill Pad Development
Rd_PKX	Portal to Crusher

## Haul Road Volume Source Apportionment

Road Activity ID	Road Segment	Description	# of Vol Sources	
			Per Road Segment	Per Road Activity ID
DA2	Rd5	Portal to west end of Portal Pad:	31	268
	Rd17	North Mill Road: WRS connector to Portal Pad	18	
	Rd4	Mill road (north of pad)	44	
	Rd6	CTF Road: N. Mill Road to PWP Road	31	
	Rd9	Truck road to soil stockpiles/PWP	144	
DAC	Rd_DCC	CWP road to N. Reclamation stockpile connector	58	277
	Rd4	Mill road (north of pad)	44	
	Rd6	Portal to west end of Portal Pad:	31	
	Rd9	Truck road to soil stockpiles/PWP	144	
DAO	Rd24	North Mill road connector to Cu-Enriched stockpile	8	231
	Rd20	North Mill Road: CU-enriched SP connector road to CTF road	48	
	Rd6	CTF Road: N. Mill Road to PWP Road	31	
	Rd9	Truck road to soil stockpiles/PWP	144	
DAW	Rd23	North Mill road connector to WRS Pad	12	227
	Rd16	North Mill Road: WRS connector to CTF	40	
	Rd6	CTF Road: N. Mill Road to PWP Road	31	
	Rd9	Truck road to soil stockpiles/PWP	144	
DAM	Rd6	CTF Road: N. Mill Road to PWP Road	31	175
	Rd9	Truck road to soil stockpiles/PWP	144	
DAP	Rd9	Truck road to soil stockpiles/PWP	144	185
	Rd_DBP	PWP Development Road	41	
DAT	Rd7	CTF Road: Middle CTF to junction soil stockpile road	102	246
	Rd9	Truck road to soil stockpiles/PWP	144	
DB2	Rd5	Portal to west end of Portal Pad:	31	61
	Rd17	North Mill Road: WRS connector to Portal Pad	18	
	Rd23	North Mill road connector to WRS Pad	12	
DBP	Rd_DAC	CTF Road: CTF to PWP junction	71	112
	Rd_DBP	PWP Development Road	41	
DBN	Rd10	CTF to NCWR	303	303
DCC	Rd25	North Mill road connector to N. Reclamation stockpile	13	71
	Rd_DCC	CWP road to N. Reclamation stockpile connector	58	

Road Segment	Model Road ID	# of Srcs
Rd5	RD5	31
Rd_PKX	PKX	33
Rd24	R24	8
Rd20	R20	48
Rd17	R17	18
Rd23	R23	12
Rd4	RD4	44
Rd18	R18	28
Rd16	R16	40
Rd25	R25	13
Rd_DCO	DCO	28
Rd_DCM	DCM	30
Rd8	RD8	87
Rd6	RD6	31
Rd9	RD9	144
Rd7	RD7	102
Rd_DBP	DBP	41
Rd_DAC	DAC	71
Rd10	R10	303
Rd19	R19	11
Rd_DCC	DCC	58

## Haul Road Volume Source Apportionment

Road Activity ID	Road Segment	Description	# of Vol Sources	
			Per Road Segment	Per Road Activity ID
DCO	Rd24	North Mill road connector to Cu-Enriched stockpile	8	49
	Rd25	North Mill road connector to N. Reclamation stockpile	13	
	Rd_DCO	NMR: Cu connector to N. Reclaim connector road	28	
DCW	Rd23	North Mill road connector to WRS Pad	12	53
	Rd25	North Mill road connector to N. Reclamation stockpile	13	
	Rd18	North Mill Road: WRS connector to N. Reclamation connector	28	
DCM	Rd25	North Mill road connector to N. Reclamation stockpile	13	43
	Rd_DCM	Mill Pad Development	30	
DDT	Rd7	CTF Road: Middle CTF to junction soil stockpile road	102	246
	Rd9	Truck road to soil stockpiles/PWP	144	
DF2	Rd5	Portal to west end of Portal Pad:	31	61
	Rd17	North Mill Road: WRS connector to Portal Pad	18	
	Rd23	North Mill road connector to WRS Pad	12	
PIT	Rd5	Portal to west end of Portal Pad:	31	176
	Rd17	North Mill Road: WRS connector to Portal Pad	18	
	Rd16	North Mill Road: WRS connector to CTF	40	
	Rd8	CTF road	87	
DFT	Rd8	CTF road	87	139
	Rd16	North Mill Road: WRS connector to CTF	40	
	Rd23	North Mill road connector to WRS Pad	12	
DGW	Rd18	North Mill Road: WRS connector to N. Reclamation connector	28	53
	Rd23	North Mill road connector to WRS Pad	12	
	Rd25	North Mill road connector to N. Reclamation stockpile	13	
DHW	Rd23	North Mill road connector to WRS Pad	12	227
	Rd16	North Mill Road: WRS connector to CTF	40	
	Rd6	CTF Road: N. Mill Road to PWP Road	31	
	Rd9	Truck road to soil stockpiles/PWP	144	
PJO	Rd5	Portal to west end of Portal Pad:	31	50
	Rd19	North Mill Road: Cu-enriched SP connector to Portal Pad	11	
	Rd24	North Mill road connector to Cu-Enriched stockpile	8	
PKX	Rd_PKX	Portal to Crusher	33	33

Road Activity ID	Total Vol Srcs: All Segments
DA2	268
DAC	277
DAO	231
DAW	227
DAM	175
DAP	185
DAT	246
DB2	61
DBP	112
DBN	303
DCC	71
DCO	49
DCW	53
DCM	43
DDT	246
DF2	61
PIT	176
DFT	139
DGW	53
DHW	227
PJO	50
PKX	33
PLT	87



### Haul Road Emissions Apportionment by Volume Source

Road Segment ID	Road Description	Road Activity ID	Vol source per Road Activity ID		Vol source per Road Segment	
			PM10 (tpy)	PM2.5 (tpy)	PM10 (tpy)	PM2.5 (tpy)
Rd_DAC	CTF Road: CTF to PWP junction	DBP	0.01817	0.00182	0.01817	0.00182
Rd_DBP	PWP Development Road	DAP	0.01989	0.00199	0.03806	0.00381
		DBP	0.01817	0.00182		
Rd_DCC	CWP road to N. Reclamation stockpile connector	DAC	0.00517	0.00052	0.01575	0.00158
		DCC	0.01059	0.00106		
Rd_DCM	Mill Pad Development	DCM	0.00443	0.00044	0.00443	0.00044
Rd_DCO	NMR: Cu connector to N. Reclaim connector road	DCO	0.00547	0.00055	0.00547	0.00055
Rd_PKX	Portal to Crusher	PKX	0.16375	0.01640	0.16375	0.01640
Rd10	CTF to NCWR	DBN	0.02825	0.00283	0.02825	0.00283
Rd16	North Mill Road: WRS connector to CTF	DAW	0.00408	0.00041	0.09680	0.00970
		PIT	0.04355	0.00436		
		DFT	0.04509	0.00452		
		DHW	0.00408	0.00041		
Rd17	North Mill Road: WRS connector to Portal Pad	DA2	0.00216	0.00022	0.06412	0.00642
		DB2	0.00675	0.00068		
		DF2	0.01165	0.00117		
		PIT	0.04355	0.00436		
Rd18	North Mill Road: WRS connector to N. Reclamation connector	DCW	0.01119	0.00112	0.03337	0.00334
		DGW	0.02217	0.00222		
Rd19	North Mill Road: Cu-enriched SP connector to Portal Pad	PJO	0.00102	0.00010	0.00102	0.00010
Rd20	North Mill Road: CU-enriched SP connector road to CTF road	DAO	0.00064	0.00006	0.00064	0.00006
Rd23	North Mill road connector to WRS Pad	DAW	0.00408	0.00041	0.10501	0.01052
		DB2	0.00675	0.00068		
		DCW	0.01119	0.00112		
		DF2	0.01165	0.00117		
		DFT	0.04509	0.00452		
		DGW	0.02217	0.00222		
		DHW	0.00408	0.00041		
Rd24	North Mill road connector to Cu-Enriched stockpile	DAO	0.00064	0.00006	0.00714	0.00071
		DCO	0.00547	0.00055		
		PJO	0.00102	0.00010		
Rd25	North Mill road connector to N. Reclamation stockpile	DCC	0.01059	0.00106	0.05386	0.00539
		DCO	0.00547	0.00055		
		DCW	0.01119	0.00112		
		DCM	0.00443	0.00044		
		DGW	0.02217	0.00222		

### Haul Road Emissions Apportionment by Volume Source

Road Segment ID	Road Description	Road Activity ID	Vol source per Road Activity ID		Vol source per Road Segment	
			PM10 (tpy)	PM2.5 (tpy)	PM10 (tpy)	PM2.5 (tpy)
Rd4	Mill road (north of pad)	DA2	0.00216	0.00022	0.00733	0.00073
		DAC	0.00517	0.00052		
Rd5	Portal to west end of Portal Pad:	DA2	0.00216	0.00022	0.06514	0.00652
		DB2	0.00675	0.00068		
		DF2	0.01165	0.00117		
		PIT	0.04355	0.00436		
		PJO	0.00102	0.00010		
Rd6	CTF Road: N. Mill Road to PWP Road	DA2	0.00216	0.00022	0.01909	0.00191
		DAC	0.00517	0.00052		
		DAO	0.00064	0.00006		
		DAW	0.00408	0.00041		
		DAM	0.00297	0.00030		
		DHW	0.00408	0.00041		
Rd7	CTF Road: Middle CTF to junction soil stockpile road	DAT	0.04812	0.00482	0.07366	0.00738
		DDT	0.02554	0.00256		
Rd8	CTF road	PIT	0.04355	0.00436	0.08864	0.00888
		DFT	0.04509	0.00452		
Rd9	Truck road to soil stockpiles/PWP	DA2	0.00216	0.00022	0.11264	0.01128
		DAC	0.00517	0.00052		
		DAO	0.00064	0.00006		
		DAW	0.00408	0.00041		
		DAM	0.00297	0.00030		
		DAP	0.01989	0.00199		
		DAT	0.04812	0.00482		
		DDT	0.02554	0.00256		
		DHW	0.00408	0.00041		

Soil Piles  
Soil Piles  
Soil Piles  
Soil Piles  
Soil Piles  
Soil Piles  
Soil Piles  
Soil Piles  
South Stockpile  
Soil Piles

Road 9 divides into two roads to the Topsoil and Subsoil Piles

NW Road = (DA2 + DAC + DAO + DAW + DAM + DAP + DAT + DHW) / 2

NE Road = NW Road + DDT

NE Road (South Pile   Subsoil)		NW Road (Topsoil)	
PM10	PM2.5	PM10	PM2.5
0.0691	0.0069	0.0436	0.0044

# Model Source Catalog

## POINT SOURCES

Source ID	Stack Release Type (Beta)	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height <sup>i</sup>		Temperature (°C)	Flow Rate (acfm)	Exit Velocity (fps)	Stack Diameter		Notes
						(ft)	(m)				(ft)	(in)	
P2	Default	325-hp Portable Diesel Engine/generator	506460.34	5179758.98	1785.00	5.5		464	1937	164.42	0.50	6	a
P4	Default	131-hp Portable Diesel Engine/generator	506339.28	5179480.90	1789.79	6		482.2222222	564	107.72	0.3333	4	a
P5	Default	545-kW /914-hp Diesel Engine/generator	507009.93	5179810.14	1785.00	7		518.2	4576.8	172.66	0.75	9	a
P6	Default	320-kW /536-hp Diesel Engine/generator	507013.64	5179810.32	1785.00	8		470	2214	83.52	0.75	9	a
P7A	Default	1000-kW /1675-hp Diesel Engine/generator - Emergency	506652.88	5179737.22	1785.00	20		473.4	7583	160.92	1.00		a, b
P7B	Default	1000-kW /1675-hp Diesel Engine/generator - Emergency	506652.88	5179732.95	1785.00	20		473.4	7583	160.92	1.00		a, b
P8	Default	100-hp Diesel Engine/generator - Emergency evac hoists (IVL)	506425.03	5180910.27	1768.86	4		565.6	635	121.28	0.3333	4	a, b
P9	Default	50-hp Diesel Fire Pump - Emergency	506626.20	5179694.19	1785.00	4		537.8	311	59.40	0.3333	4	a, b
P10A	Default	23 MMBtu/hr Propane-fired heater - Intake Vent for Upper Copper Zone	506461.85	5180859.56	1767.93	3		21.1	804082	66.65	16.00		c
P10B	Default	52 MMBtu/hr Propane-fired heater - Intake Vent for Lower Copper Zone	506614.79	5180713.21	1751.89	3		21.1	288108	23.88	16.00		c
P11	Default	3 Temporary diesel heaters at Portal - Diesel (1.2 MMBtu/hr total)	507113.94	5179868.84	1785.00	4		537.8	311	59.40	0.333	4	a
P12	Default	Jaw Crusher (3640 TPD), Building/Dust Collector	506933.01	5179755.00	1785.00		10	Ambient	10997	58.34	2.0		d, j
P13A	Default	Mill Building (mill, lime storage, etc.) Dust Collector	506588.14	5179757.70	1785.00		25	Ambient	530	44.96	0.5	6	d, j
P13B	Default	Mill Building (lime area/slurry mix tank) Dust Collector	506592.47	5179757.53	1785.00		25	Ambient	4238	66.07	1.1667	14	d, j
P14	Default	Surge Bin Discharge Dust Collector	506665.46	5179761.70	1785.00		15	Ambient	6505	61.35	1.5	18	d, j
P15	Default	Water Treatment Plant Lime Area Dust Collector	506519.80	5179685.40	1785.00		10	Ambient	4238	66.07	1.1667	14	d, j
P16A	Default	Backfill Plant Cement/Fly Ash Hopper Dust Filter/Collector	506628.14	5179724.56	1785.00		15	Ambient	763	64.75	0.5	6	d, j
P16B	Default	Backfill Plant Cement/Fly Ash Silo Dust Filter/Collector	506630.25	5179724.35	1785.00		15	Ambient	1526	57.55	0.75	9	d, j
P17	Default	Portable diesel engine/generators (total of 400 hp, 4 units)	507955.54	5178556.60	1775.01	4		565.6	635	121.28	0.3333	4	a
P18	Default	Air Compressor - Diesel Engine (275 hp)	507031.25	5179804.17	1785.00	5.5		464	1683	142.86	0.5	6	a, e
EVU	Default	Mine Ventilation Exhaust Upper Copper Zone - EVU	506461.85	5180859.56	1767.93	3		21.1	804082	66.65	16		f
EVL	Default	Mine Ventilation Exhaust Lower Copper Zone - EVL	506614.79	5180713.21	1751.89	3		21.1	288108	23.88	16		f
PORTAL	Horizontal	Mine Portal	507113.94	5179868.84	1785.00	1		21.1	269773	19.81	17		f
ProA	Default	Temporary portable propane heaters (37.8 MMBtu/hr total) - 9 total - Source represents a group of 3 heaters near the Development Phase workshop	507033.60	5179805.13	1785.00	6		482.2	151	28.84	0.3333	4	g
ProB	Default	Temporary portable propane heaters (37.8 MMBtu/hr total) - 9 total - Source represents a group of 3 heaters near the Production Phase truckshop	506706.79	5179726.42	1785.00	6		482.2	151	28.84	0.3333	4	g
ProC	Default	Temporary portable propane heaters (37.8 MMBtu/hr total) - 9 total - Source represents a group of 3 heaters near the Development Phase temporary construction stockpile crush/screen facility	506810.38	5179434.79	1785.61	6		482.2	151	28.84	0.3333	4	g
LightA	Default	Diesel-powered Light plants - 11 - 14 hp each - Source represents 2 Light plants at road intersection	506474.57	5179563.58	1788.38	3		593.3	87	29.54	0.25	3	h
LightB	Default	Diesel-powered Light plants - 11 - 14 hp each - Source represents 2 Light plants at road intersection	505832.20	5179025.19	1828.09	3		593.3	87	29.54	0.25	3	h
LightC	Default	Diesel-powered Light plants - 11 - 14 hp each - Source represents 3 Light plants at the Temp Cons Pile crusher/screening area	506822.88	5179437.51	1783.65	3		593.3	87	29.54	0.25	3	h
LightD	Default	Diesel-powered Light plants - 11 - 14 hp each - Source represents 4 Light plants at the portal pad	507138.84	5179796.97	1785.00	3		593.3	87	29.54	0.25	3	h

(a) Stack characteristics representative of similarly sized engines.

(b) Emergency use - Only input into Emergency Operations model

(c) Heaters located at Intake Vents but directly vent into the Underground Mine and exhaust through the Exit Vents. Same characteristics as EVU and EVL sources.

(d) Stack characteristics at design specifications for associated baghouse dust collectors

(e) Requires 275-hp engine

(f) Diameter based on Portal and Exhaust Vent opening dimension. Flow rates are the ventilated exhaust from the Underground Mine and is detailed in Underground Sources page of Emissions Inventory.

(g) Each heater requires a 32-hp engine. 9 heaters in total.

(h) Each light plant requires a 14-hp engine. 11 light plants in total.

(i) Elevations of 1785 are at construction grade of the portal pad and mill pad. Other elevations are calculated by AERMAP.

(j) Mill pad or portal pad dust collector sources

# Model Source Catalog

## VOLUME SOURCES - Non Road

Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Release Height (m)	Init. Horizontal Dimension (m)	Initial Vert. Dimension (m)	Side Length (m)	Vertical Dimension (m)	Total Length of Facility (m)	# of Volume Sources	Length per Vol Src <sup>e</sup> (m)	Notes
P1	250 TPH Portable Conical Crusher	506817.98	5179428.11	1785.13	2.16	3.09	2.01	13.3	4.315	13.3	1	13.3	b
P3A	Portable Screen (400 TPH)	506804.46	5179424.81	1787.36	2.45	2.77	2.28	11.9	4.9	11.9	1	11.9	b
P3B	Portable Screen (400 TPH)	506831.34	5179431.42	1783.1	2.45	2.77	2.28	11.9	4.9	11.9	1	11.9	b
CTF_T_1	CTF Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to and from haul trucks	506555.85	5179204.36	1791.7	2.00	36.05	1.86	155	4	620	4	155	c
CTF_T_2		506520.96	5179092.96	1781.7	2.00	36.05	1.86	155	4				
CTF_T_3		506491.30	5178971.05	1772.82	2.00	36.05	1.86	155	4				
CTF_T_4		506485.06	5178841.89	1776.08	2.00	36.05	1.86	155	4				
CUPILE_1	Cu Ore Pile Activities - Wind erosion and pile disturbance; Truck transfer to pile	506871.56	5179861.01	1790.99	9.00	16.28	8.37	70	18	70	1	70	d
CUPILE_T_1	Cu Ore Pile Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to haul trucks	506871.56	5179861.01	1790.99	2.00	16.28	1.86	70	4	70	1	70	c
CWP_T_1	CWP Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to haul trucks	507221.64	5179666.13	1763.49	2.00	17.83	1.86	76.67	4	230	3	76.67	c
CWP_T_2		507155.78	5179673.82	1765.97	2.00	17.83	1.86	76.67	4				
CWP_T_3		507087.44	5179679.38	1769.65	2.00	17.83	1.86	76.67	4				
DRAIN_CTF	Fugitive excavation, soil removal, and ground disturbance emissions for sources	506822.96	5178917.43	1755.28	2.00	10.47	1.86	45	4	45	1	45	c
DRAIN_PWP	Fugitive excavation, soil removal, and ground disturbance emissions for sources	506098.42	5179575.67	1776.11	2.00	7.44	1.86	32	4	32	1	32	c
MILL_T_1	Mill Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to haul trucks	506756.65	5179712.48	1786.67	2.00	20.93	1.86	90	4	360	4	90	c
MILL_T_2		506690.74	5179713.10	1788.23	2.00	20.93	1.86	90	4				
MILL_T_3		506598.18	5179717.98	1788.03	2.00	20.93	1.86	90	4				
MILL_T_4		506514.18	5179722.31	1786.86	2.00	20.93	1.86	90	4				
NCWR_T_1	NCWR Activities - excavation and ground disturbance; soil and topsoil removal; material transfers from haul trucks	507916.74	5178684.02	1760.58	2.00	29.07	1.86	125	4	500	4	125	c
NCWR_T_2		507809.88	5178683.72	1763.75	2.00	29.07	1.86	125	4				
NCWR_T_3		507695.77	5178667.79	1766.39	2.00	29.07	1.86	125	4				
NCWR_T_4		507612.00	5178663.07	1767.71	2.00	29.07	1.86	125	4				
NPILE	North Stockpile Activies - wind erosion and pile disturbance; truck transfer to pile	506487.98	5179893.59	1793.83	4.50	33.72	4.19	145	9				d

**VOLUME SOURCES - Non Road (continued)**

Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Release Height (m)	Init. Horizontal (m)	Initial Vert. Dimension (m)	Side Length (m)	Vertical Dimension (m)	Total Length of (m)	# of Volume Sources	Length per Vol Src <sup>e</sup> (m)	Notes
POWDER	Fugitive excavation, soil removal, and ground disturbance emissions for sources	506497.09	5179457.98	1794.28	2.00	10.23	1.86	44	4	44	1	44	c
PORTAL_T_1	Portal Pad Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to and from haul trucks	507143.61	5179820.30	1796.03	2.00	13.37	1.86	57.5	4	230	4	57.5	c
PORTAL_T_2		507106.28	5179799.57	1791.21	2.00	13.37	1.86	57.5	4				
PORTAL_T_3		507052.46	5179792.92	1788.9	2.00	13.37	1.86	57.5	4				
PORTAL_T_4		506987.28	5179775.59	1785.03	2.00	13.37	1.86	57.5	4				
PWP_T_1	PWP Activities - excavation and ground disturbance; soil and topsoil removal; material transfers from haul trucks	506279.53	5179454.91	1791.83	2.00	22.67	1.86	97.5	4	390	4	97.5	c
PWP_T_2		506214.01	5179436.81	1792.02	2.00	22.67	1.86	97.5	4				
PWP_T_3		506150.35	5179413.19	1794.41	2.00	22.67	1.86	97.5	4				
PWP_T_4		506076.14	5179390.33	1795.41	2.00	22.67	1.86	97.5	4				
SPILE	South Stockpile Activies - wind erosion and pile disturbance; truck transfer to pile	506018.86	5178859.25	1838.84	4.50	27.91	4.19	120	9	120		1	d
SUBS	Subsoil Stockpile Activies - wind erosion and pile disturbance; truck transfer to pile	506024.04	5178692.01	1847.67	4.50	32.09	4.19	138	9	138		1	d
TEMP	Temporary construction stockpile - wind erosion and pile distrubance; transfers to and from haul trucks	506850.15	5179399.21	1784.48	3.05	18.14	2.84	78	6.096	78		1	d
TOPS	Topsoil Stockpile Activies - wind erosion and pile disturbance; truck transfer to pile	505770.23	5178842.50	1839.4	4.50	27.91	4.19	120	9	120		1	d
WRS_1	WRS - Wind erosion and pile disturbance; Truck transfer to pile	506764.15	5179948.71	1791.91	7.50	53.49	6.98	230	15	230	3	76.67	d
WRS_2		506711.19	5179930.46	1794.48	7.50	53.49	6.98	230	15				
WRS_3		506662.85	5179908.94	1795.79	7.50	53.49	6.98	230	15				
WRS_T_1	WRS Activities - excavation and ground disturbance; soil and topsoil removal; material transfers to haul trucks	506764.15	5179948.71	1791.91	2.00	17.83	1.86	76.67	4	230	3	76.67	c
WRS_T_2		506711.19	5179930.46	1794.48	2.00	17.83	1.86	76.67	4				
WRS_T_3		506662.85	5179908.94	1795.79	2.00	17.83	1.86	76.67	4				

(a) All source dimensions based on EPA guidance for Single Volume Sources at Surface Level.

Single Volume Source: Init. Horizontal Dim. = Side Length / 4.3

Surface Based Source: Init. Vertical Dim. = Vertical Dimension / 2.15

(b) Source characteristics based on physical dimensions of similarly sized equipment.

(c) Vertical dimension based on the height of a CAT D9T Dozer in order to simulate material excavation, soil removal, and ground clearing.

(d) Vertical dimension based on stockpile height to simulate emissions spanning the vertical dimension of the pile.

(e) Length per volume source is used to calculated the Initial Horizontal Dimension for individual volume sources that are part of a group of sources spanning an area

i.e., The entire NCWR is 500 m in length and uses 4 volume sources to represent emissions. Each of the 4 volume sources is effecitvely 125 meters in length (500/4 = 125)

## Model Source Catalog

### VOLUME SOURCES - Haul and Access Roads

Road Type	Source Description	Easting (X)	Northing (Y)	Base Elevation <sup>c</sup>	Release Height	Init. Horiz. Dim.	Init. Vert. Dim.	Vehicle Height	Vehicle Width	Vehicle Length	Plume Height	Road Width	Road Width	Width of Plume	Notes
		(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(ft)	(m)	
Haul Road - CTF	Haul Road Segments comprising the CTF Haul Road	Varies	Varies	Varies	3.50	7.44	3.25	4.11	--	8.81	6.995		10	16	d, f
Haul Road - Service	Haul Road Segments comprising the Service Haul Roads	Varies	Varies	Varies	3.50	4.51	3.25	4.11	3.69	8.81	6.995	--	--	9.69	e, f, g
Construction Access Road	Temporary Construction Access Road sources (Source ID: CON)	Varies	Varies	Varies	2.11	3.88	1.96	2.48	2.35	7.87	4.217			8.35	e, h
Main Access Road	Main Access Road sources (Source ID: ACC)	Varies	Varies	Varies	2.11	6.48	1.96	2.48	--	7.87	4.217	26.00	7.92	13.92	d, h

(a) Volume sources designed using Guidance per EPA Haul Road Workgroup Final Report 2012

(b) Volume sources designed as adjacent, surface based sources

Adjacent Volume Sources: Init. Horizontal Dim. = Width of Plume / 2.15

Surface Based Source: Init. Vertical Dim. = Plume Height / 2.15

(c) Sources located on the mill or portal pads have an adjusted elevation 1785 meters

(d) Initial Horizontal Dimension based on two lane roadway

(e) Initial Horizontal Dimension based on vehicle width (single lane roadway)

(f) Based on dimensions of a Haul Truck with a target payload of 42 - 44 tons

(g) Service Haul Roads provide access to the PWP, NCWR, CWP, Topsoil and Subsoil Stockpiles

(h) Based on dimensions of an International Durastar Extended Cab - Characteristic of average payload vehicle traveling on roadway

(i) All adjacent