Montana Department of
ENVIRONMENTAL QUALITY
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December 26, 2013

Bob Jacko
Tintina Resources, Inc.
Black Butte Copper Project
200 Granville Street, Suite 2560
Vancouver, BC V6C 1S4
Canada

Dear Mr. Jacko:

Montana Air Quality Permit #4978-00 is deemed final as of December 25, 2013, by the Department of Environmental Quality (Department). This permit is for a underground copper exploration project and associated equipment. All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For the Department,

Julie Merkel
Air Permitting Program Supervisor
Air Resources Management Bureau
(406) 444-3626

Doug Kuenzli
Environmental Science Specialist
Air Resources Management Bureau
(406) 444-4267

JM:DCK
Enclosure

Montana Department of Environmental Quality
Permitting and Compliance Division

Montana Air Quality Permit #4978-00

Tintina Resources, Inc.
Black Butte Copper Project
200 Granville Street
Suite 2560
Vancouver, BC V6C 1S4
Canada

December 25, 2013

MONTANA AIR QUALITY PERMIT

Issued To: Tintina Resources, Inc.
Black Butte Copper Project
200 Granville Street
Suite 2560
Vancouver, BC V6C 1S4
Canada

Montana Air Quality Permit: #4978-00
Application Complete: 10/10/2013
Preliminary Determination Issued: 11/18/2013
Department's Decision Issued: 12/09/2013
Permit Final: 12/25/2013
AFS #: 059-0004

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Tintina Resources, Inc. (Tintina), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

SECTION I: Permitted Facilities

A. Permitted Equipment

Tintina proposes construction of an exploration decline, known as the Black Butte Copper Project (BBCP), to conduct drilling and provide ore recovery for metallurgical evaluation, as well as associated hydrogeological and geotechnical assessments. The proposed project will consist of development drilling, approximately 10,000 tons of ore recovery for bulk sampling, and tailings removal and storage. A complete list of the permitted equipment is included in the Permit Analysis.

B. Plant Location

Land leases for the Tintina's BBCP include the following location in Meagher County; Sections 23, 24, 25, 26, 28, 32, 33, 34, 35 and 36, Township 12 North, Range 6 East; Sections 19, 29, 30 and 31, Township 12 North, Range 7 East; and Sections 1 and 12, Township 11 North, Range 5 East.

SECTION II: Conditions and Limitations

A. Emission Limitations

1. Maximum ore and development rock production shall be limited to 122,640 tons per any 12-month rolling period (ARM 17.8.749).

2. Tintina is authorized to operate the following diesel-fired engines in support of the BBCP:

   a. One or more diesel-fired generator set(s), where the combined maximum rated design capacity of the generator engine(s) shall not exceed 475 brake-horsepower (bhp) (ARM 17.8.749).

   b. One or more diesel-fired emergency generator set(s), where the combined maximum rated design capacity of the emergency generator engine(s) shall not exceed 475 bhp (ARM 17.8.749).

   c. One or more diesel-fired air compressor engine(s), where the combined maximum rated design capacity of the engine(s) shall not exceed 275 bhp (ARM 17.8.749).

3. Tintina shall operate the engines described in Section II.A.2 with good combustion practices to provide the maximum air pollution control for which they were designed (ARM 17.8.752).

4. At a minimum, the diesel engine(s) defined under Section II.A.2 shall be certified to the United States Environmental Protection Agency's (USEPA) Interim Tier 4 exhaust emission standard as specified within 40 Code of Federal Regulations (CFR) 1039.102, Table 6 (Phase-in or All engines Option) (ARM 17.8.749).

5. Operation, including operation for maintenance and testing, of the emergency generator set engine defined under Section II.A.2.b shall be limited to 500 hours during any rolling 12-month period (ARM 17.8.49).

6. Tintina shall only burn diesel fuel in the engines defined under Section II.A.2, compliant with 40 CFR 80.510(b); having a sulfur content no greater than 0.0015% (15 parts per million) by weight (ARM 17.8.752).

7. The total combined maximum designed heat input capacity of the propane-fired heaters shall not exceed 10 million British thermal units per hour (MMBtu/hr) (ARM 17.8.749).

8. Tintina shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304 and ARM 17.8.752).

9. Tintina shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

10. Tintina shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.7 (ARM 17.8.749 and ARM 17.8.752).

11. Tintina shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements contained in 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (ARM 17.8.340 and 40 CFR 60, Subpart IIII).

12. Tintina shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements contained in 40 CFR 63, Subpart ZZZZ, National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, for any applicable diesel engine (ARM 17.8.342 and 40 CFR 63, Subpart ZZZZ).

B. Testing Requirements

1. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

2. The Department of Environmental Quality (Department) may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

1. Tintina shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. Tintina shall notify the Department of any construction or improvement project conducted, pursuant to ARM 17.8.745, that would include ***the addition of a new emissions unit***, change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to startup or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by Tintina as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

4. Tintina shall document, by month, the amount of ore and development rock production. By the 25th day of each month, Tintina shall total the ore and development rock production for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.1. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

5. Tintina shall have available onsite at all times documentation for the diesel engines that verifies their compliance with USEPA Interim Tier 4 diesel engine exhaust emission standards as described in Section II.A.3 (ARM 17.8.749).

D. Notification

1. Tintina shall provide the Department with written notification of the actual date of initial start-up of operations postmarked within 15 days of such date (ARM 17.8.749).

2. Tintina shall provide the Department with written notification of the actual date of initial start-up for each diesel engine (including engine replacement) postmarked within 15 days of such date (ARM 17.8.749).

SECTION III: General Conditions

A. Inspection – Tintina shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (Continuous Emission Monitoring

Systems (CEMS)/Continuous Emission Rate Monitoring Systems (CERMS)) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if Tintina fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Tintina of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefor, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by Tintina may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

Montana Air Quality Permit (MAQP) Analysis
Tintina Resources, Inc. – Black Butte Copper Project
Montana Air Quality Permit #4978-00

I. Introduction/Process Description

Tintina Resources, Inc. (Tintina) proposes to operate an underground mineral exploration project, known as the Black Butte Copper Project (BBCP). The facility is located in within Sections 25 and 36, Township 12 North, Range 6 East and Sections 30 and 31, Township 12 North, Range 7 East, in Meagher County, Montana.

A. Permitted Equipment

The equipment and emission sources covered by MAQP #4978-00 consists of the following emissions sources:

Point Sources (Non-fugitive)	
Identification	Description
Primary Generator Set(s)	Diesel-fired generator-set(s) up to 475 brake-horsepower (bhp) [Interim Tier 4 Certified]
Emergency Generator Set(s)	Diesel-fired emergency generator-set(s) up to 475 bhp [Interim Tier 4 Certified]
Air Compressor Engine(s)	Diesel-fired air compressor engine(s) up to 275 bhp [Interim Tier 4 Certified]
Heating Unit(s)	Propane-fired heaters, including but not limited to; portal heaters and space heaters with a combined maximum heat input capacity rated of 10 million British thermal units per hour (MMBtu/hr)
Underground Fugitive Emission Sources	
Identification	Description
Wet Drilling	Wet drilling of rock formation to facilitate construction of decline portal and deposit sampling
Explosive Detonation	Ammonium nitrate /fuel oil (ANFO) blasting of rock formation
Ore/Rock Loading	Loading of produced ore and development rock
Aboveground Fugitive Emission Sources	
Identification	Description
Topsoil/Subsoil Removal	Initial removal of overlying soils from site grading and to allow decline access to bedrock formation
Topsoil/Subsoil Unloading	Initial topsoil/subsoil unloading and storage pile formation
Rock/Ore Unloading	Unloading of development rock/ore unloading and Potentially Acid Generating (PAG)/Non-Acid Generating (NAG) storage pile formation
Wind Erosion-Soil Piles	Initial wind erosion of topsoil/subsoil prior to stabilization and re-vegetation (two topsoil piles 1.28 acres; one subsoil pile 1.45 acres)
Wind Erosion-PAG Piles	Ongoing wind erosion of PAG storage pile (0.95 acres)
Wind Erosion-NAG Piles	Ongoing wind erosion of NAG storage pile (1.26 acres)
Haul Roads	Unpaved roadways

B. Source Description

BBCP is an underground metallic mineral exploration decline into identified copper, cobalt, and silver deposits. The proposed exploration project will consist of a single decline whereby development rock and ore will be extracted for metallurgical assessment. The exploration decline will allow for other technical geotechnical and hydrogeological investigation. Wet drilling methods will be employed to allow for placement of explosives and to provide sampling access to outlying deposits. ANFO charges will be used to advance the decline and dislodge development rock and ore-bearing material.

Development rock and ore-bearing materials are to be loaded in haul truck and transported to the surface and deposited into either the PAG or NAG storage piles. Samples will be pulled and shipped off-site for further processing.

Primary and back-up power for the project will be provided by diesel-fired generator sets with a combined engine capacity of up to 475 bhp each. It is anticipated that the proposed site preparation, driving the drift, and definition drilling activities would take between 8 and 16 months. The project aims to extract a10,000 ton bulk sample for metallurgical testing.

C. Response to Public Comments

On behalf of Tintina, Bison Engineering, Inc. (Bison) submitted the following comments;

Permit Reference	Comment	Department Response
Section I.B	Applicant requested that a comprehensive listing of the lease held in association with the BBCP be accounted for in the location description	The Department included all locations identified within the legal description
Section II.A.7	Applicant requested clarification on the intent of the condition addressing propane-fired heating equipment.	The Department complied with the applicant's request and condition altered to clarify that the established maximum heat input limit was a combined limit to address all affected equipment.
Section II.A.11	Applicant requested the requirements within Section II.A.11 be separated into two distinct conditions.	The Department agreed to the applicant's request.
MAQP Analysis Section I.B & EA Items 3 & 8.H	Applicant requested an expansion to the description of exploration phase as it relates to duration of activities proposed.	The Department agreed to the applicant's request. Reference to project timing was removed from EA item 3.
MAQP Analysis Section II.C.10	Applicant requested clarification to the description of applicability to the requirements of 40 CFR 63.	The Department agreed to the applicant's request and language was changed to address the applicability to the specific equipment.
MAQP Analysis Section III.D & EA Item 7.F	In the control of fugitive dust emissions, the Department erroneously presented the use of spray bars as a BACT proposed by the applicant. Subsequently the applicant requested that the use of spray bars be removed as a proposed method of BACT	The Department agreed to the applicant's request. The reference to spray bars as BACT was removed from the referenced permit locations.
EA Item 7.B	The applicant requested clarification to the Department's statement regarding the possibility of significant impacts to water quality as result of this permit action and possible conflicts to the expressed conclusions of the EA.	The statement alluding to potential significant impacts was based on resulting impacts prior to any application of controls. Exploration license #00710 issued by the Department of Environmental Quality – Environmental Management Bureau requires standard mining techniques to mitigate impacts from waste storage, including collection, monitoring, and treatment of storm water as necessary.
Various	The applicant requested correction to multiple typographical errors	The identified errors were corrected

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   Tintina shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide (NO_2)
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide (CO)
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone (O_3)
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide (H_2S)
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter (PM)
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead (Pb)
10. ARM 17.8.223 Ambient Air Quality Standard for Particulate Matter with an Aerodynamic Diameter of Ten Microns or Less (PM_{10})

Tintina must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, Tintina shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause or authorize to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.

6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 Code of Federal Regulations (CFR) Part 60, Standards of Performance for New Stationary Sources (NSPS). Tintina may be considered an NSPS affected facility under 40 CFR Part 60 and subject to the requirements of the following subparts.

   a. 40 CFR 60, Subpart A – General Provisions apply to all equipment or facilities subject to an NSPS Subpart as listed below:

   b. 40 CFR 60, Subpart LL – Standards of Performance for Metallic Mineral Processing Plants – No affected equipment is proposed under this application, therefore, Subpart LL is not applicable.

   c. 40 CFR 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE). Owners and operators of 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 owners and operators of stationary CI ICE that modify or reconstruct their stationary CI ICE after July 11, 2005, are subject to this subpart. Based on the information submitted by Tintina, the CI ICE equipment to be used under MAQP #4978-00 meets the definition of affected units and are therefore subject to Subpart IIII.

8. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. The owner or operator of any existing or new stationary source, as defined and applied in 40 CFR Part 61, shall comply with the standards and provisions of 40 CFR Part 61.

9. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This rule incorporates, by reference, 40 CFR 63, National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories. Equipment proposed under this action will be subject to the requirements of 40 CFR Part 63 as follows:

   a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to a National Emission Standard for Hazardous Air Pollutants (NESHAP) Subpart as listed below:

   b. 40 CFR 63, Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE). As an area source, the diesel engines operated by Tintina will be subject to this rule as new CI RICE.

D. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. Tintina submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

E. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year (tpy) of any pollutant. Tintina has a PTE greater than 25 tpy of CO; therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. Tintina submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. Tintina submitted an affidavit of publication of public notice for the October 8, 2013 issue of the *Great Falls Tribune*, a newspaper of general circulation in the City of Great Falls in Cascade County, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that Best Available Control Technology (BACT) shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Tintina of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or modified source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that

do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source because this facility is not a listed source and the facility's PTE is below 250 tpy of any pollutant (excluding fugitive emissions).

G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

a. PTE > 100 tpy of any pollutant;

b. PTE > 10 tpy of any single hazardous air pollutant (HAP), PTE > 25 tpy of any combination of HAPs, or lesser quantity as the Department may establish by rule; or

c. PTE > 70 tpy of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #4978-00 for Tintina, the following conclusions were made:

a. The facility's PTE is less than 100 tpy for any pollutant.

b. The facility's PTE is less than 10 tpy for any single HAP and less than 25 tpy of combined HAPs.

c. This source is not located in a serious PM_{10} nonattainment area.

d. This facility is subject to a current NSPS (40 CFR 60, Subpart IIII).

e. This facility is subject to the area source provisions of a current NESHAP (40 CFR 63, Subpart ZZZZ).

f. This source is not a Title IV affected source, or a solid waste combustion unit.

g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that Tintina will be a minor source of emissions as defined under Title V. However, if minor sources subject to NSPS are required to obtain a Title V Operating Permit, Tintina may be required to obtain a Title V Operating Permit.

III. BACT Determination

A BACT determination is required for each new or modified source. Tintina shall install on the new or modified source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was submitted by Tintina in permit application #4978-00, providing a top-down analysis of available methods of controlling emissions from the proposed sources. The Department reviewed the analysis and methods presented, as well as previous BACT determinations. The following control options have been selected as constituting BACT. The complete BACT analysis submitted by Tintina is maintained by the Department and is available for review.

A. Diesel Engine(s) BACT – PM and Gaseous Emissions (Combustion)

The control options required for BACT are consistent with other recently permitted similar sources and are capable of achieving the appropriate emission standards. As such the Department concurs that the control options selected for the proposed diesel engine constitute BACT in this application.

1. Interim Tier 4 Certified Engines

Tintina proposed the utilization of engines certified to EPA's Interim Tier 4 exhaust emission standards for non-road engines as promulgated under 40 CFR Part 1039.102, Table 6 for generator sets greater than or equal to130 kilowatts (kW) and less than 560 kW. Operation of a Tier 4 Engine provides for significant reduction in PM_{10}, NO_x, CO and VOC and presents the most stringent engine exhaust control standards currently applicable.

2. Engine Design and Good Combustion Practice

The use of engine design and good combustion practice was proposed as BACT; in lieu of post manufacture add-on controls. The Department concurs with this proposal and has determined that BACT is good combustion practices to provide the maximum air pollution control for which they were designed. With the proposed use of diesel-fired engines which meet the Interim Tier 4 exhaust emission standards, Tintina will employ engines meeting the highest design standards presently available. Manufacturers meeting the Interim Tier 4 Standard integrate an advanced emission control mechanisms as a design component of the generator engine. Typically these advanced emission control components would include oxidation catalyst for PM control, selective catalytic reduction SCR, and air-to-fuel ratio control. Additionally, these engines will be required to comply with the National Emissions Standards for Hazardous Air Pollutant Sources for Stationary Reciprocating Internal Combustion Engines (40 CFR 63, Subpart ZZZZ), as well as the Standard of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR

60, Subpart IIII) which specify work practice and monitoring standards to ensure engines are maintained and operated in manner consistent with good air pollution control practice for minimizing emissions.

3. Fuel Requirements

Tintina proposed the use of ultra-low sulfur diesel (ULSD) as fuel to fire the diesel engines proposed under this action as BACT for SO_2 control. The Department concurs with this proposal and has determined that is BACT.

B. Propane Heaters BACT – PM and Gaseous Emissions

A top-down BACT analysis was not presented for the propane heaters, as the annual uncontrolled emissions from the combustion of propane fuel within the proposed equipment are less than 7 tpy for each criteria pollutant. At these emission rates any add-on controls would not be economically feasible. Therefore, BACT for the control of gaseous and particulate emission for this source is proper design and operation.

C. Drilling and Blasting BACT – PM and Gaseous Emissions

A top-down BACT analysis was not presented for the drilling and blasting activities authorized by MAQP #4978-00. Methods proposed for underground drilling and blasting are consistent within industry standards and represent best operating practice. Underground mining will be performed using wet drilling to prepare the rock face and an ANFO blasting agent to liberate and fracture the ore. Wet drilling practices minimize associated particulate emissions, while ANFO detonation generates particulate and gaseous emission. The Department is not aware of any control to be applied to minimize emission generated during underground blasting other than the following best operating practices proposed by Tintina;

- Optimize drill holes size and placement to ensure effective blasting, thus reducing the number of blast and provide maximum decline advance.
- Spray the blast area with water after each blast to reduce airborne dust.

The Department concurs that the best operating practices offered for wet drilling and blasting represent BACT and further that these measures are acceptable under the reasonable precaution provisions of ARM 17.8.308 for airborne particulate.

D. Material Handling/Unpaved Roadway BACT – PM Emissions

The exploratory project will have multiple non-point source fugitive emissions resulting from activities, mainly from loading and unloading of development rock/ore into haul trucks and deposition to storage piles, wind erosion of storage piles, general plant areas, and unpaved roadways. Particulate emissions from material handling emissions from site grading and topsoil/subsoil pile forming will occur initially. Water and chemical dust suppressants are the standard method employed for control of this type of fugitive emissions. Both methods of emissions controls are readily available and commonly used. Chemical dust suppressant alone could be used to control the fugitive emissions; however, as water is more readily available, is less expensive, is equally effective as chemical dust suppressant, and is more environmentally friendly, water has been identified as BACT for fugitive particulate emissions. In addition, water suppression has been required of recently permitted similar sources. Tintina may use chemical dust suppressant to assist in controlling particulate emissions from the surrounding plant area. Several facility processes incorporate the introduction of water to the materials or naturally occurring high moisture content of the material, both of which are capable of achieving the desired control of particulate emissions from storage or transfer operations.

According to ARM 17.8.308, Tintina is required to take reasonable precautions to limit the fugitive emissions of airborne particulate matter from haul roads, access roads, parking areas, and the general area of operation. Tintina is required to have water available on site (at all times) and to apply the water, as necessary, to maintain compliance with the opacity and reasonable precaution limitations. Tintina may also use chemical dust suppression in order to maintain compliance with fugitive emission limitations in Section II.A of MAQP #49780-00. The Department determined that using water and/or chemical dust suppressant to maintain compliance with the opacity requirements and reasonable precaution limitations constitutes BACT for the fugitive emission sources.

IV. Emission Inventory

Potential Emissions Summary [Tons/Year]

Point Source Emissions (Non-Fugitive)								
Emission Source	PM	PM_{10}	$PM_{2.5}$	CO	NOx	SO_2	VOC	CO_2e
Primary Generator Set Engine [≤ 475 bhp]	0.07	0.07	0.07	11.97	1.37	4.27	5.23	2383.04
Emergency Generator Set Engine [≤ 475 bhp]	0.004	0.004	0.004	0.68	0.078	0.24	0.30	136.02
Air Compressor Engine [≤ 475 bhp]	0.04	0.04	0.04	6.93	0.792	2.47	3.03	1379.65
Propane Heaters [≤ 10 mmbtu/hr]	0.34	0.34	0.24	3.59	6.22	0.72	0.48	6119.17
TOTAL POINT SOURCE EMISSIONS ▶	0.45	0.45	0.35	23.18	8.46	7.70	9.04	10017.88

Fugitive Emissions									
	Emission Source	PM	PM_{10}	$PM_{2.5}$	CO	NOx	SO_2	VOC	CO_2e
Aboveground	Topsoil/Subsoil Removal	5.63	2.87	0.29	--	--	--	--	--
Aboveground	Topsoil/Subsoil Unloading	0.04	0.02	0.00	--	--	--	--	--
Aboveground	Development Rock/Ore Unloading	0.06	0.03	0.00	--	--	--	--	--
Aboveground	Wind Erosion - Storage Piles	0.96	0.48	0.05	--	--	--	--	--
Aboveground	Unpaved Roadways (Haul Roads)	16.52	4.60	0.46	--	--	--	--	--
Underground	Wet Drilling	0.01	0.00	0.00	--	--	--	--	--
Underground	ANFO Blasting	0.08	0.04	0.00	24.46	6.21	0.73	--	--
Underground	Development Rock/Ore Loading	0.06	0.03	0.00	--	--	--	--	--
	TOTAL FUGITIVE EMISSIONS ▶	23.35	8.07	0.81	24.46	6.21	0.73	0.00	0.00

TOTAL FACILITY EMISSIONS ▶	23.80	8.52	1.16	47.63	14.67	8.43	9.04	10017.88

BSFC, brake specific fuel consumption	MM, million
bhp, brake-horsepower	mph, miles per hour
Btu, British Thermal Units	NO_X, oxides of nitrogen
Ce, control efficiency	PTE, Potential To Emit
CO_2e, carbon dioxide equivalent	PM, particulate matter
CO, carbon monoxide	PM_{COND}, condensable particulate matter
CFR, Code of Federal Regulations	PM_{10}, particulate matter with an aerodynamic diameter of 10 microns or less
ft^3, cubic feet	$PM_{2.5}$, particulate matter with an aerodynamic diameter of 2.5 microns or less [Sum of condensable and filterable]
Yd^3, cubic yard	SCC, Source Classification Code
EF, emission factor	SO_2, sulfur dioxide
g, gram	TPH, tons per hour
gr, grains	TPY, tons per year
GWP, Global Warming Potential	VMT, vehicle miles travelled
hr, hour	VOC, volatile organic compounds
lbs, pounds	

Black Butte Copper Exploration Project

Point Sources (Non-Fugitive)

Diesel Generator Engine(s) - Primary Generator Set [SCC 2-01-001-02]:

Tier 4 Certified Diesel-Fired Genset Engine

Engine Rating: 475 bhp [Design Maximum Output]
354 kW [Design Maximum Output]

Fuel Input: 3.33 MMBtu/hr [BSFC →7,000 Btu/hp-hr]
24.3 gallons/hour [Estimated →19,300 Btu/lb]

Operating Hours: 8760 hours/year

Particulate Emissions (controlled):

PM Emissions:

Emission Factor	0.020 g/hp-hr	[40 CFR 1039.102, Table 6]	
Calculations	(0.02 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) =	0.02	lbs/hr
	(0.02 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =	0.068	TPY

PM_{10} Emissions:

Emission Factor	0.020 g/hp-hr	[40 CFR 1039.102, Table 6]	
Calculations	(0.02 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) =	0.02	lbs/hr
	(0.02 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =	0.068	TPY

$PM_{2.5}$ Emissions (filterable & condensable):

Emission Factor	0.020 g/hp-hr	[40 CFR 1039.102, Table 6]	
Calculations	(0.02 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) =	0.02	lbs/hr
	(0.02 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =	0.068	TPY

CO Emissions (controlled):

Emission Factor	3.50 g/hp-hr	[40 CFR 1039.102, Table 6]	
Calculations	(3.5 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) =	2.73	lbs/hr
	(2.73 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =	11.97	tpy

NOx Emissions (controlled):

Emission Factor	0.40 g/hp-hr	[40 CFR 1039.102, Table 6]	
Calculations	(0.4 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) =	0.31	lbs/hr
	(0.31 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =	1.37	tpy

SO_2 Emissions (uncontrolled):

Emission Factor	0.00205 lb/hp-hr	[AP-42 Table 3.3-1, 10/96]	
Calculations	(0.00205 lb/hp-hr) * (475 bhp) =	0.97	lbs/hr
	(0.97 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =	4.27	tpy

VOC Emissions (uncontrolled):

Emission Factor	0.00251 lb/hp-hr	[AP-42 Table 3.3-1, 10/96]	
Calculations	(0.0025141 lb/hp-hr) * (475 bhp) =	1.19	lbs/hr
	(1.19 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =	5.23	tpy

CO_2 Emissions (uncontrolled):

Emission Factor	163.08 lb/mmbtu	[40 CFR 98, Subpart C -Table C-1]	
Calculations	(163.0818 lb/hp-hr) * (3.325 mmbtu/hr) =	542.25	lbs/hr
	(542.25 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =	2375.04	tpy

CH_4 Emissions (uncontrolled):

Emission Factor	0.00662 lb/mmbtu	[40 CFR 98, Subpart C -Table C-2]	
Calculations	(0.006615 lb/hp-hr) * (3.325 mmbtu/hr) =	0.02	lbs/hr
	(0.02 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =	0.10	tpy

N_2O Emissions (uncontrolled):

Emission Factor	0.00132 lb/mmbtu	[40 CFR 98, Subpart C -Table C-2]	
Calculations	(0.001323 lb/hp-hr) * (3.325 mmbtu/hr) =	0.004	lbs/hr
	(0.004 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =	0.02	tpy

CO_2e Emissions:

GWP Emission Factors [40 CFR 98, Subpart A -Table A-1]

	Base Rate [tons/yr]	GWP	CO_2e [tons/yr]
CH_4 Emissions →	0.10	21	2.02
N_2OEmissions →	0.02	310	5.97
CO_2 Emissions →	2375.04	1	2375.04
		CO_2e (total) ►	2383.04

Diesel Generator Engine(s) - Emergency Generator Set [SCC 2-01-001-02]:

Tier 4 Certified Diesel-Fired Genset Engine

Engine Rating: 475 bhp [Design Maximum Output]
354 kW [Design Maximum Output]

Fuel Input: 3.33 MMBtu/hr [BSFC →7,000 Btu/hp-hr]
24.3 gallons/hour [Estimated →19,300 Btu/lb]

Operating Hours: 500 hours/year

Particulate Emissions (controlled):

PM Emissions:

Emission Factor 0.020 g/hp-hr [40 CFR 1039.102, Table 6]

Calculations (0.02 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) = 0.02 lbs/hr
(0.02 lbs/hr) * (500 hrs/yr) * (0.0005 tons/lb) = 0.004 tpy

PM_{10} Emissions:

Emission Factor 0.020 g/hp-hr [40 CFR 1039.102, Table 6]

Calculations (0.02 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) = 0.02 lbs/hr
(0.02 lbs/hr) * (500 hrs/yr) * (0.0005 tons/lb) = 0.004 tpy

$PM_{2.5}$ Emissions (filterable & condensable):

Emission Factor 0.020 g/hp-hr [40 CFR 1039.102, Table 6]

Calculations (0.02 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) = 0.02 lbs/hr
(0.02 lbs/hr) * (500 hrs/yr) * (0.0005 tons/lb) = 0.004 tpy

CO Emissions (controlled):

Emission Factor 3.50 g/hp-hr [40 CFR 1039.102, Table 6]

Calculations (3.5 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) = 2.73 lbs/hr
(2.73 lbs/hr) * (500 hrs/yr) * (0.0005 tons/lb) = 0.683 tpy

NOx Emissions (controlled):

Emission Factor 0.40 g/hp-hr [40 CFR 1039.102, Table 6]

Calculations (0.4 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) = 0.31 lbs/hr
(0.31 lbs/hr) * (500 hrs/yr) * (0.0005 tons/lb) = 0.078 tpy

SO_2 Emissions (uncontrolled):

Emission Factor 0.00205 lb/hp-hr [AP-42 Table 3.3-1, 10/96]

Calculations (0.00205 lb/hp-hr) * (475 bhp) = 0.97 lbs/hr
(0.97 lbs/hr) * (500 hrs/yr) * (0.0005 tons/lb) = 0.243 tpy

VOC Emissions (uncontrolled):

Emission Factor 0.00251 lb/hp-hr [AP-42 Table 3.3-1, 10/96]

Calculations (0.0025141 lb/hp-hr) * (475 bhp) = 1.19 lbs/hr
(1.19 lbs/hr) * (500 hrs/yr) * (0.0005 tons/lb) = 0.299 tpy

CO_2 Emissions (uncontrolled):

Emission Factor 163.08 lb/mmbtu [40 CFR 98, Subpart C -Table C-1]
Calculations (163.0818 lb/hp-hr) * (3.325 mmbtu/hr) = 542.25 lbs/hr
(542.25 lbs/hr) * (500 hrs/yr) * (0.0005 tons/lb) = 135.562 tpy

CH_4 Emissions (uncontrolled):

Emission Factor 0.00662 lb/mmbtu [40 CFR 98, Subpart C -Table C-2]
Calculations (0.006615 lb/hp-hr) * (3.325 mmbtu/hr) = 0.02 lbs/hr
(0.02 lbs/hr) * (500 hrs/yr) * (0.0005 tons/lb) = 0.005 tpy

N_2O Emissions (uncontrolled):

Emission Factor 0.00132 lb/mmbtu [40 CFR 98, Subpart C -Table C-2]
Calculations (0.001323 lb/hp-hr) * (3.325 mmbtu/hr) = 0.004 lbs/hr
(0.00 lbs/hr) * (500 hrs/yr) * (0.0005 tons/lb) = 0.001 tpy

CO2e Emissions:

GWP Emission Factors [40 CFR 98, Subpart A -Table A-1]

	Base Rate [tons/yr]	GWP	CO2e [tons/yr]
CH_4 Emissions →	0.01	21	0.11547
N_2OEmissions →	0.00	310	0.34092
CO_2 Emissions →	135.56	1	135.562
		CO2e (total) ►	136.018

Diesel Engine(s) - Air Compressor [SCC 2-01-001-02]:
Tier 4 Certified Diesel-Fired Compressor Engine
Engine Rating: 275 bhp [Design Maximum Output]
205 kW [Design Maximum Output]
Fuel Input: 1.93 MMBtu/hr [BSFC →7,000 Btu/hp-hr]
14.0 gallons/hour [Estimated →19,300 Btu/lb]
Operating Hours: 8760 hours/year

Particulate Emissions (controlled):

PM Emissions:

Emission Factor 0.020 g/hp-hr [40 CFR 1039.102, Table 6]
Calculations (0.02 g/hp-hr) * (205.071 kW) * (0.002205 lbs / 1 g) = 0.01 lbs/hr
(0.01 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) = 0.040 tpy

PM_{10} Emissions:

Emission Factor 0.020 g/hp-hr [40 CFR 1039.102, Table 6]
Calculations (0.02 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) = 0.01 lbs/hr
(0.01 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) = 0.040 tpy

$PM_{2.5}$ Emissions (filterable & condensable):

Emission Factor 0.020 g/hp-hr [40 CFR 1039.102, Table 6]
Calculations (0.02 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) = 0.01 lbs/hr
(0.01 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) = 0.040 tpy

CO Emissions (controlled):

Emission Factor	3.50 g/hp-hr	[40 CFR 1039.102, Table 6]	
Calculations	(3.5 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) =		1.58 lbs/hr
	(1.58 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		6.93 tpy

NOx Emissions (controlled):

Emission Factor	0.40 g/hp-hr	[40 CFR 1039.102, Table 6]	
Calculations	(0.4 g/hp-hr) * (354.213 kW) * (0.002205 lbs / 1 g) =		0.18 lbs/hr
	(0.18 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		0.792 tpy

SO_2 Emissions (uncontrolled):

Emission Factor	0.00205 lb/hp-hr	[AP-42 Table 3.3-1, 10/96]	
Calculations	(0.00205 lb/hp-hr) * (475 bhp) =		0.56 lbs/hr
	(0.56 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		2.47 tpy

VOC Emissions (uncontrolled):

Emission Factor	0.00251 lb/hp-hr	[AP-42 Table 3.3-1, 10/96]	
Calculations	(0.0025141 lb/hp-hr) * (475 bhp) =		0.69 lbs/hr
	(0.69 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		3.03 tpy

CO_2 Emissions (uncontrolled):

Emission Factor	163.08 lb/mmbtu	[40 CFR 98, Subpart C -Table C-1]	
Calculations	(163.0818 lb/hp-hr) * (1.925 mmbtu/hr) =		313.93 lbs/hr
	(313.93 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		1375.02 tpy

CH_4 Emissions (uncontrolled):

Emission Factor	0.00662 lb/mmbtu	[40 CFR 98, Subpart C -Table C-2]	
Calculations	(0.006615 lb/hp-hr) * (1.925 mmbtu/hr) =		0.01 lbs/hr
	(0.01 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		0.06 TPY

N_2O Emissions (uncontrolled):

Emission Factor	0.00132 lb/mmbtu	[40 CFR 98, Subpart C -Table C-2]	
Calculations	(0.001323 lb/hp-hr) * (1.925 mmbtu/hr) =		0.00 lbs/hr
	(0.003 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		0.01 TPY

CO2e Emissions:

GWP Emission Factors [40 CFR 98, Subpart A -Table A-1]

	Base Emissions	GWP	CO_2e
	[tons/yr]		[tons/yr]
CH_4 Emissions →	0.06	21	1.17126
N_2OEmissions →	0.01	310	3.45801
CO_2 Emissions →	1375.02	1	1375.02
		CO_2e (total) ►	1379.65

Propane-Fired Heaters [SCC 1-033-010-02 (water heaters) & SCC 1-05-002-10 (space heaters)]:

Fuel Input:	10.00	MMBtu/hr [Combined Maximum Design Capacity]
	109.29	gallons/hour [Estimated]
Fuel Heat Value:	0.0915	MMBtu/gal [AP-42 1.5, 07/08]
Operating Hours:	8760	hours/year
Sulfur content:	15	gr/100 ft

Particulate Emissions (uncontrolled):

Total PM Emissions (Total):

Emission Factor	0.7000	lb/1000 gal	[AP- 42 Table 1.5-1, 07/08]	
Calculations	(0.7 lb/gal) * (109.29 gal/hr) * (1gal /1000 gal)=		0.08	lbs/hr
	(0.07650 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		0.34	tpy

Total Emissions (filterable):

Emission Factor	0.2000	lb/1000 gal	[AP- 42 Table 1.5-1, 07/08]	
Calculations	(0.2 lb/gal) * (109.29 gal/hr) * (1gal /1000 gal)=		0.02	lbs/hr
	(0.02186 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		0.10	tpy

Total Emissions (condensable):

Emission Factor	0.50	lb/1000 gal	[AP- 42 Table 1.5-1, 07/08]	
Calculations	(0.5 lb/gal) * (109.29 gal/hr) * (1gal /1000 gal)=		0.05	lbs/hr
	(0.05464 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		0.24	tpy

CO Emissions (uncontrolled):

Emission Factor	7.50	lb/1000 gal	[AP- 42 Table 1.5-1, 07/08]	
Calculations	(7.5 lb/gal) * (109.29 gal/hr) * (1gal /1000 gal)=		0.82	lbs/hr
	(0.81967 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		3.59	tpy

NOx Emissions (uncontrolled):

Emission Factor	13.00	lb/1000 gal	[AP- 42 Table 1.5-1, 07/08]	
Calculations	(13 lb/gal) * (109.29 gal/hr) * (1gal /1000 gal)=		1.42	lbs/hr
	(1.42077 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		6.22	tpy

SO2 Emissions (uncontrolled):

Emission Factor	0.10	(S) lb/1000 gal*	[AP- 42 Table 1.5-1, 07/08]	
Calculations	(0.1 lb/gal) * (109.29 gal/hr) * (15 g/100 ft3) * (1gal /1000 gal)=		0.16	lbs/hr
	(0.16393 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		0.72	tpy

* *(s) = sulfur content 15 grains/100 ft3 gas vapor*

VOC Emissions (uncontrolled):

Emission Factor	1.00	lb/1000 gal*	[AP- 42 Table 1.5-1, 07/08]	
Calculations	(1 lb/gal) * (109.29 gal/hr) * (1gal /1000 gal)=		0.11	lbs/hr
	(0.10929 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		0.48	tpy

* *As total hydrocarbons*

CH4 Emissions (uncontrolled):

Emission Factor	0.20	lb/1000 gal	[AP- 42 Table 1.5-1, 07/08]	
Calculations	(0.2 lb/gal) * (109.29 gal/hr) * (1gal /1000 gal)=		0.02	lbs/hr
	(0.02186 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		0.10	tpy

CO2 Emissions (uncontrolled):

Emission Factor	12500.00	lb/1000 gal	[AP- 42 Table 1.5-1, 07/08]	
Calculations	(12500 lb/gal) * (109.29 gal/hr) * (1gal /1000 gal)=		1366.12	lbs/hr
	(1,366.12022 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		5983.61	tpy

N2O Emissions (uncontrolled):

Emission Factor	0.90	lb/1000 gal	[AP- 42 Table 1.5-1, 07/08]

Calculations (0.9 lb/gal) * (109.29 gal/hr) * (1gal /1000 gal)= 0.10 lbs/hr
(0.09836 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) = 0.43 tpy

CO2e Emissions:

GWP Emission Factor [40 CFR 98, Subpart A -Table A-1]

	Base Rate [tons/yr]	GWP	CO2e [tons/yr]
CH_4 Emissions →	0.10	21	2.01049
N_2OEmissions →	0.43	310	133.554
CO_2 Emissions →	5983.61	1	5983.61
		CO2e (total) ►	6119.17

Aboveground Fugitive Emission Sources

Topsoil/Subsoil Removal [SCC 3-11-001-01]:

Process Rate: 129400 yd^3/yr
194100 tons/yr [1.5 tons/yd^3]

Particulate Emissions (uncontrolled):

PM Emissions:

Emission Factor 0.058 lbs/ton [AP-42 Table 11.19-4, 07/98]
Calculations (0.058 lbs/ton) * (194100 tons/yr) = 11257.80 lbs/yr
(11257.8 lbs/yr) * (0.0005 tons/lb) = 5.63 tpy

PM_{10} Emissions:

Emission Factor 0.030 lbs/ton [PM_{10} = PM * 0.51 ► AP-42 Appendix B.2 - Table B.2.2, Category 3, 1/95]
Calculations (0.02958 lbs/ton) * (194100 tons/yr) = 5741.48 lbs/yr
(5741.478 lbs/yr) * (0.0005 tons/lb) = 2.87 tpy

$PM_{2.5}$ Emissions:

Emission Factor 0.002958 lbs/ton [$PM_{2.5}$ = PM_{10} * 0.1 ► $PM_{2.5}$ USEPA Multiplier*]
Calculations (0.002958 lbs/ton) * (194100 tons/yr) = 574.15 lbs/yr
(574.1478 lbs/yr) * (0.0005 tons/lb) = 0.29 tpy
* *Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10, T. Pace USEPA*

Topsoil and Subsoil Unloading [SCC 3-11-001-01]:

Process Rate: 129,400 yd^3/yr
194100 tons/yr [1.5 tons/yd^3]
Pile Transfers: 1 transfer [Pile Formation]

Particulate Emissions (uncontrolled):

Emission Factor EF = k (0.0032) * [(U/5)^1.3 / (M / 2)^1.4] [AP-42 13.2.4, 11/06]

where: EF, Emission Factor = lbs Emitted / ton Processed
k, Dimensionless Particle Size Multiplier PM = 0.74 [AP-42 13.2.4, 11/06]
k, Dimensionless Particle Size Multiplier PM_{10} = 0.35 [AP-42 13.2.4, 11/06]
k, Dimensionless Particle Size Multiplier $PM_{2.5}$ = 0.053 [AP-42 13.2.4, 11/06]
U, Mean Wind Speed (mph) = 3.0 [On-site MET Data]
M, Material Moisture Content (%) = 4.00 [Applicant Data]

PM Emissions:

Emission Factor	EF = 0.74 * (0.0032) * [(3/5)^1.3 / (4/ 2)^1.4] =	0.00046	lbs/ton
Calculations	(0.0005 lbs/ton) * (194100 tons/yr) * (1 pile transfers) =	89.65	lbs/yr
	(89.65 lbs/hr) * (0.0005 tons/lb) =	0.045	Tpy

PM_{10} Emissions:

Emission Factor	EF = 0.35 * (0.0032) * [(3/5)^1.3 / (4/ 2)^1.4] =	0.0002	lbs/ton
Calculations	(0.0002 lbs/ton) * (194100 tons/yr) * (1 pile transfers) =	42.40	lbs/yr
	(42.40 lbs/hr) * (0.0005 tons/lb) =	0.021	tpy

$PM_{2.5}$ Emissions:

Emission Factor	EF = 0.053 * (0.0032) * [(3/5)^1.3 / (4/ 2)^1.4] =	0.00003	lbs/ton
Calculations	(0.0000 lbs/ton) * (194100 tons/yr) * (1 pile transfers) =	6.42	lbs/yr
	(6.42 lbs/hr) * (0.0005 tons/lb) =	0.003	tpy

Development Rock/Ore Unloading [SCC 3-05-103-98]:

Process Rate:	14	tons/hr [Applicant Data]
	122640	tons/year [Applicant Data]
Pile Transfers:	2	transfer [Truck Load-out → Pile Formation]

Particulate Emissions (uncontrolled):

Emission Factor EF = k (0.0032) * [(U/5)^1.3 / (M / 2)^1.4] [AP-42 13.2.4, 11/06]

where: EF, Emission Factor = lbs Emitted / ton Processed

k, Dimensionless Particle Size Multiplier PM =	0.74	[AP-42 13.2.4, 11/06]
k, Dimensionless Particle Size Multiplier PM_{10} =	0.35	[AP-42 13.2.4, 11/06]
k, Dimensionless Particle Size Multiplier $PM_{2.5}$ =	0.053	[AP-42 13.2.4, 11/06]
U, Mean Wind Speed (mph) =	3.0	[On-site MET Data]
M, Material Moisture Content (%) =	4.00	[Applicant Data]

PM Emissions:

Emission Factor	EF = 0.74 * (0.0032) * [(3/5)^1.3 / (4/ 2)^1.4] =	0.00046	lbs/ton
Calculations	(0.0005 lbs/ton) * (122640 tons/yr) * (2 pile transfers) =	113.29	lbs/yr
	(113.29 lbs/hr) * (0.0005 tons/lb) =	0.057	tpy

PM_{10} Emissions:

Emission Factor	EF = 0.35 * (0.0032) * [(3/5)^1.3 / (4/ 2)^1.4] =	0.0002	lbs/ton
Calculations	(0.0002 lbs/ton) * (122640 tons/yr) * (2 pile transfers) =	53.58	lbs/yr
	(53.58 lbs/hr) * (0.0005 tons/lb) =	0.027	tpy

$PM_{2.5}$ Emissions:

Emission Factor	EF = 0.053 * (0.0032) * [(3/5)^1.3 / (4/ 2)^1.4] =	0.00003	lbs/ton
Calculations	(0.0000 lbs/ton) * (122640 tons/yr) * (2 pile transfers) =	8.11	lbs/yr
	(8.11 lbs/hr) * (0.0005 tons/lb) =	0.004	tpy

Wind Erosion - Storage Piles [SCC 3-05-103-98]:

Storage Pile Data:

NAG Pile	1.26	Acres
PAG Pile	0.95	Acres
Topsoil/Subsoil	2.73	Acres

Total Storage Pile Area 4.94 Acres
Control Method: Water Application (Reasonable Precautions)
Control Efficiency (Ce): 50% [MT DEQ Policy]

Particulate Emissions:

PM Emissions:

Emission Factor	780 lbs/acre-yr [MT DEQ Policy]	
Calculations	(780 lbs/acre-yr) * (4.94 Acres) * (0.0005 tons/lb) =	1.93 tpy (uncontrolled)
	(1.9266 tpy) * (1 - 0.5 Ce) =	0.96 tpy (controlled)

PM_{10} Emissions:

Emission Factor	390 lbs/acre-yr [MT DEQ Policy]	
Calculations	(390 lbs/acre-yr) * (4.94 Acres) * (0.0005 tons/lb) =	0.96 tpy (uncontrolled)
	(0.9633 tpy) * (1 - 0.5 Ce) =	0.48 tpy (controlled)

$PM_{2.5}$ Emissions:

Emission Factor	39 lbs/acre-yr [MT DEQ Policy]	
Calculations	(39 lbs/acre-yr) * (4.94 Acres) * (0.0005 tons/lb) =	0.10 tpy (uncontrolled)
	(0.09633 tpy) * (1 - 0.5 Ce) =	0.05 tpy (controlled)

Unpaved Roadways (Haul Roads) [SCC 3-05-020-90]:

Miles Travelled: 16 Miles/Day [Applicant Estimate]
Vehicle Weight: 40 Tons [Mean Vehicle Weight Empty/Full]
Control Method: Water Application (reasonable Precautions)
Control Efficiency (C_e): 50% [MT DEQ Policy]

Particulate Emissions (controlled):

Emission Factor $EF = k(s/12)^{a} * (W/3)^{b}$ [AP-42 13.2.2.2, 11/06]

where: EF, Emission Factor = lbs Emitted Per Vehicle Mile Traveled (VMT)

k,	Empirical Constant PM =	4.9 [AP-42 Table 13.2.2-2, 11/06]
k,	Empirical Constant PM_{10} =	1.5 [AP-42 Table 13.2.2-2, 11/06]
k,	Empirical Constant $PM_{2.5}$ =	0.15 [AP-42 Table 13.2.2-2, 11/06]
s,	Surface Material Silt Content (%) =	7.5 [Applicant Provided Data]
W,	Mean Vehicle Weight (tons) =	40 [Applicant Provided Data]
a,	Empirical Constant PM =	0.7 [AP-42 Table 13.2.2-2, 11/06]
a,	Empirical Constant $PM_{10}/PM_{2.5}$ =	0.9 [AP-42 Table 13.2.2-2, 11/06]
b,	Empirical Constant PM - $PM_{2.5}$ =	0.45 [AP-42 Table 13.2.2-2, 11/06]

PM Emissions:

Emission Factor	EF = 4.9 * (7.5/12)^0.7 * (40/3)^0.45 =	11.31 lbs/VMT	
Calculations	(11.31 lbs/VMT) * (16 miles/day) * (1 - 0.5 Ce) =		90.49 lbs/day
	(90.49 lbs/day) * (365 days/yr) * (0.0005 tons/lb) =		16.52 tpy

PM_{10} Emissions:

Emission Factor	EF = 1.5 * (7.5/12)^0.9 * (40/3)^0.45 =	3.15 lbs/VMT	
Calculations	(3.15 lbs/VMT) * (16 miles/day) * (1 - 0.5 Ce) =		25.22 lbs/day
	(25.22 lbs/day) * (365 days/yr) * (0.0005 tons/lb) =		4.60 tpy

$PM_{2.5}$ Emissions:

Emission Factor	EF = 0.15 * (7.5/12)^0.9 * (40/3)^0.45 =	0.32	lbs/VMT
Calculations	(0.32 lbs/VMT) * (16 miles/day) * (1 - 0.5 Ce) =	2.52	lbs/day
	(2.52 lbs/day) * (365 days/yr) * (0.0005 tons/lb) =	0.46	tpy

Underground Fugitive Emission Sources

Wet Drilling [SCC 3-05-025-14]:

Process Rate: 14 tons/hour
122640 tons/yr

Particulate Emissions (controlled):

PM Emissions:

Emission Factor	0.0002 lbs/ton [PM = PM_{10} /0.51 ► AP-42 Appendix B.2 - Table B.2.2, Category 3, 1/95]		
Calculations	(0.0002 lbs/ton) * (122640 tons/yr) =	19.24	lbs/yr
	(19.24 lbs/yr) * (0.0005 tons/lb) =	0.01	tpy

PM_{10} Emissions:

Emission Factor	0.00008 lbs/ton [AP-42 Table 11.19.2-2, 08/04]		
Calculations	(0.00008 lbs/ton) * (122640 tons/yr) =	9.81	lbs/yr
	(9.81 lbs/yr) * (0.0005 tons/lb) =	0.0049	tpy

$PM_{2.5}$ Emissions:

Emission Factor	0.000008 lbs/ton [$PM_{2.5}$ = PM_{10} * 0.1 ► $PM_{2.5}$ USEPA Multiplier*]		
Calculations	(0.000008 lbs/ton) * (194100 tons/yr) =	1.55	lbs/yr
	(1.55 lbs/yr) * (0.0005 tons/lb) =	0.0008	tpy

* *Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10, T. Pace USEPA*

ANFO Blasting [SCC 3-05-025-14]:

Process Rate:
Area per Blast: 470 ft3 [Applicant Data]
Blast per Day: 3 Blast [Applicant Data]
ANFO Use: 2 tons/day [Applicant Data]

Particulate Emissions (uncontrolled):

Emission Factor	0.000014 (A)^1.5 [AP-42 Table 11.9-1, 07/98]		
Calculations	(0.000014) * $(470)^{1.5}$ =	0.143	lbs PM/blast
	where: A, area per blast (ft^3)		

PM Emissions:

Emission Factor	0.143 lbs/blast		
Calculations	(0.143 lbs/blast) * (3 bast/day) =	0.43	lbs/day
	(0.428 lbs/yr) * (365 blasts/day) * (0.0005 tons/lb) =	0.078	tpy

PM_{10} Emissions:

Emission Factor	0.074 lbs/blast [PM_{10} = PM * 0.52 scaling factor ► AP-42 Table 11.9-1]		
Calculations	(0.074 lbs/blast) * (3 bast/day) =	0.22	lbs/day
	(0.223 lbs/yr) * (365 blasts/day) * (0.0005 tons/lb) =	0.041	tpy

$PM_{2.5}$ Emissions:

Emission Factor 0.004280 lbs/blast [$PM_{2.5}$ = PM * 0.03 scaling factor ► AP-42 Table 11.9-1]

Calculations	(0.004 lbs/blast) * (3 bast/day) =	0.013	lbs/day
	(0.013 lbs/yr) * (365 blasts/day) * (0.0005 tons/lb) =	0.002	tpy

CO Emissions (uncontrolled):

Emission Factor	67.00 lbs/ton [AP- 42 Table 13.3-1, 02/80]		
Calculations	(67 lbs/ton) * (2 tons/day) =	134.00	lbs/day
	(134.00 lbs/yr) * (365 days/year) * (0.0005 tons/lb) =	24.46	tpy

NOx Emissions (uncontrolled):

Emission Factor	17.00 lbs/ton [AP- 42 Table 13.3-1, 02/80]		
Calculations	(17 lbs/ton) * (2 tons/day) =	34.00	lbs/day
	(34.00 lbs/yr) * (365 days/year) * (0.0005 tons/lb) =	6.21	tpy

SO2 Emissions (uncontrolled):

Emission Factor	2.00 lbs/ton [AP- 42 Table 13.3-1, 02/80]		
Calculations	(2 lbs/ton) * (2 tons/day) =	4.00	lbs/day
	(4.00 lbs/yr) * (365 days/year) * (0.0005 tons/lb) =	0.73	tpy

Development Rock/Ore Loading [SCC 3-05-020-33]:

Process Rate:	14	tons/hr [Applicant Data]
	122640	tons/year
Pile Transfers:	1	transfer [Truck Load-in]

Particulate Emissions (uncontrolled):

Emission Factor EF = k (0.0032) * [(U/5)^1.3 / (M / 2)^1.4] [AP-42 13.2.4, 11/06]

where: EF, Emission Factor = lbs Emitted / ton Processed

k, Dimensionless Particle Size Multiplier PM =	0.74	[AP-42 13.2.4, 11/06]
k, Dimensionless Particle Size Multiplier PM_{10} =	0.35	[AP-42 13.2.4, 11/06]
k, Dimensionless Particle Size Multiplier $PM_{2.5}$ =	0.053	[AP-42 13.2.4, 11/06]
U, Mean Wind Speed (mph) =	3.0	[On-site MET Data]
M, Material Moisture Content (%) =	4.00	[Applicant Data]

PM Emissions:

Emission Factor	EF = 0.74 * (0.0032) * [(3/5)^1.3 / (4/ 2)^1.4] =	0.00046	lbs/ton
Calculations	(0.0005 lbs/ton) * (122640 tons/yr) * (1 transfer) =	113.29	lbs/yr
	(113.29 lbs/hr) * (0.0005 tons/lb) =	0.057	tpy

PM_{10} Emissions:

Emission Factor	EF = 0.35 * (0.0032) * [(3/5)^1.3 / (4/ 2)^1.4] =	0.0002	lbs/ton
Calculations	(0.0002 lbs/ton) * (122640 tons/yr) * (1 transfer) =	53.58	lbs/yr
	(53.58 lbs/hr) * (0.0005 tons/lb) =	0.027	tpy

$PM_{2.5}$ Emissions:

Emission Factor	EF = 0.053 * (0.0032) * [(3/5)^1.3 / (4/ 2)^1.4] =	0.00003	lbs/ton
Calculations	(0.0000 lbs/ton) * (122640 tons/yr) * (1 pile transfer) =	8.11	lbs/yr
	(8.11 lbs/hr) * (0.0005 tons/lb) =	0.004	tpy

V. Existing Air Quality

The BBCP is located within Sections 25 and 36, Township 12 North, Range 6 East and Sections 30 and 31, Township 12 North, Range 7 East, in Meagher County, Montana. The air quality of this area is classified as unclassifiable/attainment for National Ambient Air Quality Standards (NAAQS) pollutants, including particulate matter species (PM_{10}/$PM_{2.5}$).

VI. Ambient Air Impact Analysis

In the view of the Department, the amount of controlled emissions generated by this project will not cause concentrations of any regulated pollutant in the ambient air that exceed any set ambient standard. Any potential impacts will be minimized by the conditions and limitations established in MAQP #4978-00.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

YES	NO	
✓		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	✓	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	✓	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	✓	4. Does the action deprive the owner of all economically viable uses of the property?
	✓	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	✓	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	✓	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	✓	7a. Is the impact of government action direct, peculiar, and significant?
	✓	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	✓	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	✓	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

Permit Analysis Prepared by: D. Kuenzli
Date: November 12, 2013

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: Tintina Resources, Inc.

Montana Air Quality Permit Number: 4978-00

Preliminary Determination Issued: 11/18/2013
Department Decision Issued: 12/09/2013
Permit Final: 12/25/2013

1. *Legal Description of Site*: The proposed Tintina Resources, Inc. (Tintina) – Black Butte Copper Project (BBCP) would be located within Sections 25 and 36, Township 12 North, Range 6 East and Sections 30 and 31, Township 12N, Range 7 East, in Meagher County, Montana.

2. *Description of Project*: Tintina proposes the construction and operating of an underground exploration project consisting of drifting, development rock removal and storage, and ore recovery for bulk sampling.

3. *Objectives of Project*: The objective of the BBCP is for Tintina to gain a better understanding of the resources through underground drilling, technical investigations to support mine planning, and bulk sampling for metallurgical testing.

4. *Alternatives Considered*: In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because Tintina demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a BACT analysis, would be included in MAQP #4978-00.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

Potential Physical and Biological Effects							
		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			✓			yes
B	Water Quality, Quantity, and Distribution			✓			yes
C	Geology and Soil Quality, Stability, and Moisture			✓			yes
D	Vegetation Cover, Quantity, and Quality			✓			yes
E	Aesthetics			✓			yes
F	Air Quality			✓			yes
G	Unique Endangered, Fragile, or Limited Environmental Resource			✓			yes
H	Demands on Environmental Resource of Water, Air, and Energy			✓			yes
I	Historical and Archaeological Sites				✓		yes
J	Cumulative and Secondary Impacts			✓			yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

This permitting action would have a minor effect on terrestrial and aquatic life and habitats in the project area. The project would be located on private land owned by Tintina. The current land use is generally agricultural, with hay and livestock production the primary activities. The Department has determined that any impacts from emissions or deposition of pollutants would be minor due to dispersion characteristics of the pollutants, the atmosphere, and the conditions that would be placed in MAQP #4978-00.

B. Water Quality, Quantity and Distribution

Impact from resulting from this permitting action would likely have a minor or limited effect on the water quality, water quantity, and distribution, as surface waters are not prevalent within the immediate area surrounding the mine site and Tintina will employ mining techniques to minimize impact to below the level of significance. Particulate matter emissions from disturbance of soils and development would be deposited at varying distance within the mine boundary or vicinity depending upon particle size, location of release, and wind affects. However, because of pollutant characteristics and generally good dispersion in the area, minor pollutant deposition on surface waters near the project area may occur from surface disturbances and roadways. Air emissions from this source would not likely impact groundwater. Therefore, fugitive dust emissions the project would be expected to have only minor impacts to water quality, quantity or distribution in the area.

C. Geology and Soil Quality, Stability and Moisture

Air emissions from this project would have a minor effect on the geology and soil quality, stability, and moisture of the surrounding area. The project would be entirely located on private land owned or leased by Tintina. The air quality permit associated with this project would contain limitations and conditions to minimize the effect of the emissions to off-site aspects.

D. Vegetation Cover, Quantity, and Quality

The project would likely have a minor effect on the local vegetation. The impacts from emissions or deposition of pollutants would be minor due to dispersion characteristics of the pollutants, the atmosphere, and the conditions that would be placed in MAQP #4978-00.

E. Aesthetics

The project would have a minor effect on the local aesthetics. The project would be entirely located on private land owned or leased by Tintina. The majority of the exploration activities would take place underground and would not be visible or audible. Noise from onsite activities may be audible from areas in close proximately to the project; however the impact would be expected to be minor for public areas or private lands not owned or leased by Tintina.

F. Air Quality

The area surrounding the proposed project is unclassifiable/attainment for the National Ambient Air Quality Standards (NAAQS) for all criteria air pollutants. The Department believes that concentrations of the criteria pollutants in the area are at or near background levels and well below any NAAQS levels. Emissions of air pollutants would occur as a result of the project. MAQP #4978-00 would contain conditions limiting opacity and require, as necessary, the use of water and/or chemical dust suppressants to control dust from vehicle traffic and process equipment. In turn, operational restrictions would be in place to control gaseous and particulate emissions from combustion sources, including, diesel engine operations, blasting, and propane-fired heaters. If the facility operates in compliance with all applicable permit requirements, then the impacts would be expected to be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

In an effort to identify any unique endangered, fragile, or limited environmental resources in the area, the Department contacted the Montana Natural Heritage Program, Natural Resource Information System (NRIS). In this case, the area was defined by the section, township, and range of the proposed location with an additional 1-mile buffer zone. Search results identified the following animal species of concern may be present within the search radius; the Long-billed Curlew, Clark's Nutcracker, Sprague's Pipit, Brewer's Sparrow, Baird's Sparrow, Cassin's Finch, Westslope Cutthroat Trout, Wolverine. The Department determined that any effects on the local populations would be expected to be minor, as the project would occur on a relatively small locale that is existing hay or cattle grazing area which is frequently disturbed.

H. Demands on Environmental Resource of Water, Air and Energy

The proposed project would necessitate an increased demand in fuel usage and result in a minor increase in energy demand in the area. Any impact on the environmental resource of energy in the area would be minor. Further, an increase in air pollution would result from the proposed project; however, the Department believes that any impacts would be minor due to dispersion characteristics of pollutants and the atmosphere, and conditions placed in MAQP #4978, including, but not limited to, BACT requirements discussed in Section III of the permit analysis for this permit.

I. Historical and Archaeological Sites

According to past correspondence from the Montana State Historic Preservation Office (SHPO), there is low likelihood of adverse disturbance to any known archaeological or historic site, given previous industrial disturbance within the area. Therefore, it is unlikely that the current permit action would impact any known historic or archaeological site.

J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the physical and biological environment in the immediate area would likely be minor. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as outlined in MAQP #4978-00. From an air quality perspective, the potential emissions expected from operating the facility at its maximum throughput on a continuous basis would not violate ambient air quality standards. Therefore, the MAQP is written to reflect the expected emissions from operating continuously at the maximum rate. Tintina may be restricted on annual throughput by other government jurisdictions which would limit ore production to a level less than described in the MAQP.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

Potential Social and Economic Effects							
		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				✓		yes
B	Cultural Uniqueness and Diversity				✓		yes
C	Local and State Tax Base and Tax Revenue				✓		yes
D	Agricultural or Industrial Production				✓		yes
E	Human Health			✓			yes
F	Access to and Quality of Recreational and Wilderness Activities				✓		yes
G	Quantity and Distribution of Employment				✓		yes
H	Distribution of Population				✓		yes
I	Demands for Government Services			✓			yes
J	Industrial and Commercial Activity				✓		yes
K	Locally Adopted Environmental Plans and Goals				✓		yes
L	Cumulative and Secondary Impacts			✓			yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores

The project would result in minor, if any, disruption to the local social structures and mores. The property on which the project would occur is private land owned or leased by Tintina and the proposed project would not change the predominant use of the surrounding area.

B. Cultural Uniqueness and Diversity

The Department believes that the proposed project would have no impact to the cultural uniqueness and diversity of the surrounding area because the project would be located on private land and the activities occurring there would be similar to previous exploratory adits and mines that have been located in the area.

C. Local and State Tax Base and Tax Revenue

The project would have a minor effect on the local and state tax base and revenue due to the taxes generated from the purchase of supplies and the mine payroll (see Section G – Quantity and Distribution of Employment).

D. Agricultural or Industrial Production

The project would result in a minor impact to the agricultural production because potential grazing land would be cleared for the project. These impacts would be limited to the land owners. Industrial production of the local community would not be affected by the proposed project.

E. Human Health

The proposed project would result in minor contributions to air pollution from the proposed project. However, MAQP #4978-00 would incorporate conditions including, but not limited to, the BACT requirements discussed in Section III of the permit analysis, to ensure that the operations would maintain compliance with all applicable rules and standards. These rules and standards are designed to be protective of human health. Any impact to human health from the proposed project would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

The project would not have an impact to the access to recreational and wilderness activities because no road closures would occur and the site would be located on private property. The project would have a minor impact on the quality of recreational and wilderness activities due to the slight increase in emissions of air pollutants and the noise generated by the equipment.

G. Quantity and Distribution of Employment

The project would employ an estimated 17 to 45 employees during the exploration phase. Additional man-power would be provided through sub-contracted services. With the exploration project, no long term impact to the quantity and distribution of employment would be expected.

H. Distribution of Population

No permanent jobs are planned through the initial of this project. As the site preparation, driving the drift, and definition drilling of the BBCP is anticipated to last 8 to 16 months, no permanent distribution of population is expect to occur as a result of this permit action.

I. Demands for Government Services

Government services would be required for acquiring the appropriate permits from government agencies. In addition, the permitted source of emissions would be subject to periodic inspections by government personnel. Demands for government services would be expected to be minor.

J. Industrial and Commercial Activity

Operation of the project would result in a minor increase in the industrial activity in the area. The exploratory adit would create some additional industrial activity in the area. However, the Department believes the impacts would be minor because of the relatively small size of the project.

K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans or goals. The state standards would protect the proposed site and the environment surrounding the site.

L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from this project would result in minor impacts to the economic and social environment in the immediate area. As previously stated, the proposed permit would result in a slight increase in short-term employment in the area, and a temporary increase in industrial process in the area. The Department believes that Tintina would be expected to operate in compliance with all applicable rules and regulations as outlined in MAQP #4978-00.

Recommendation: No Environmental Impact Statement (EIS) is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permitting action is for the construction and operation of an underground exploration project. MAQP #4978-00 includes conditions and limitations to ensure the facility would operate in compliance with all applicable air quality rules and regulations. In addition, there are no significant impacts associated with this proposal.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program, Montana Department of Environmental Quality – Hard Rock Program.

Individuals or groups contributing to this EA: Department of Environmental Quality – Air Resources Management Bureau, Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program, Montana Department of Environmental Quality – Hard Rock Program.

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Date: November 12, 2013