



Montana Department of  
**ENVIRONMENTAL QUALITY**

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August 11, 2014

Mark Thompson  
Barrick Golden Sunlight  
Golden Sunlight Mines, Inc.  
453 U.S. Highway 2 East  
Whitehall, MT 59759

Dear Mr. Thompson:

Montana Air Quality Permit #1689-08 is deemed final as of August 9, 2014, by the Department of Environmental Quality (Department). This permit is for an open pit gold mine. 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 A. Merkel  
Air Permitting Program Supervisor  
Air Resources Management Bureau  
(406) 444-3626

Craig Henrikson, P.E.  
Environmental Engineer  
Air Resources Management Bureau  
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JM:CH  
Enclosure

Montana Department of Environmental Quality  
Permitting and Compliance Division

Montana Air Quality Permit #1689-08

Mark Thompson  
Barrick Golden Sunlight  
Golden Sunlight Mines, Inc.  
453 U.S. Highway 2 East  
Whitehall, MT 59759

August 9, 2014



## Montana Air Quality Permit

Issued to: Barrick Golden Sunlight Mine  
Golden Sunlight Mines Inc.  
453 U.S. Highway 2 East  
Whitehall, MT 59759

MAQP #1689-08  
Application Complete: 6/9/2014  
Preliminary Decision Issued: 7/8/2014  
Department's Decision: 7/24/2014  
Final Permit Issued: 8/9/2014  
AFS #043-0002

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Barrick Golden Sunlight Mine, (GSM) pursuant to Section 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. Plant Location

GSM operates an open pit gold mine including ore processing operations, located at Township 2 North, Range 3 West, Jefferson County, Montana, near the southern end of the Bull Mountains, approximately 5 air miles northeast of Whitehall, Montana, at an elevation of 5,200 feet mean sea level MSL. The physical address is 453 U.S. Highway 2 East, Whitehall, MT.

#### B. Current Permit Action

The Department of Environmental Quality (Department) received an application on June 9, 2014, from GSM requesting that MAQP #1689-07 be modified to include the addition of a diesel-powered stacker to handle periods whenever the tertiary crusher would be bypassed. In 2007 a tertiary crusher de minimis bypass request was approved; however, this current request for modification also includes a capacity increase greater than the earlier de minimis request. The current permit action will add the additional stacker, modify the description of the crushing circuit, provide a minor administrative correction to Section II.A.14, and update the permit to reflect the current permit language and rule references used by the Department. Language has also been added to address the possible future construction of a fine ore processing unit (FOP) which would trigger 40 CFR Part 60, Subpart LL.

### Section II: Conditions and Limitations

#### A. Emission Limitations

GSM shall install, operate, and maintain the following emission control equipment and procedures, and all emission control equipment and procedures specified in their application for an alteration of their MAQP and subsequent revisions (ARM 17.8.749):

1. Fall distance shall be minimized during topsoil, overburden, ore and wastes removal, transfer, and dumping.
2. All topsoil stockpiles and disturbed or exposed areas shall be stabilized with chemicals, mulch, or revegetation.

3. Drilling shall be conducted with skirting and water sprays.
4. Blasting shall be conducted in such a way as to prevent overshooting.
5. GSM 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).
6. GSM 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.5 (ARM 17.8.749).
7. The primary, secondary and tertiary crushers and all handling, conveying and storage areas shall be enclosed and vented to a scrubber unless otherwise noted (ARM 17.8.752).
8. Fine ore stockpile discharges and coarse ore discharges (to barricaded area) shall be controlled by water sprays (ARM 17.8.752).
9. The carbon regeneration unit and the refining furnace shall be totally enclosed and all emissions vented to a wet scrubber (ARM 17.8.752).
10. All conveyors and pick-up points in the fine crushing building shall be enclosed and vented to a wet scrubber (ARM 17.8.752).
11. The fine ore reclaim and conveyor area shall be enclosed and vented to a wet scrubber (ARM 17.8.752).
12. The FOP unit shall be enclosed and vented through a dust collector bag house (ARM 17.8.749).
13. Activity on all storage and waste dump piles shall be restricted to minimize agitation of fugitive dust.
14. GSM shall not cause or authorize to be discharged into the atmosphere from any crusher, screen, bucket, elevator, conveyor belt transfer point, dryer storage bin, storage area, refining furnace or carbon regeneration unit any stack emissions that:
  - a. Contain particulate matter in excess of 0.05 grams per dry standard cubic meter (g/dscm) (ARM 17.8.752).
  - b. Exhibit greater than 20% opacity (ARM 17.8.304).
15. GSM 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).
16. Upon construction of the Fine Ore Processing Unit (FOP), GSM will be subject to 40 CFR 60, Subpart LL (2L), and must meet the applicable requirements under 2L. If the FOP is never constructed, GSM will not be subject to 2L unless another modification triggers 2L (ARM 17.8.340 and 40 CFR 60, Subpart LL).

## B. Testing Requirements

1. GSM has conducted performance source tests on the primary, secondary and tertiary crushers, the carbon regeneration unit and the refinery furnace showing compliance with the applicable emission standards. GSM shall test the listed sources on a rotating basis so that each source is tested at a minimum of once every 4 years. All source tests shall be performed at over 90% of the maximum rated capacity of the affected facility or source. These tests shall include determination of total mass particulate and particulate matter with an aerodynamic diameter of ten microns or less (PM<sub>10</sub>). The source tests shall be conducted in accordance with the applicable test methods listed in 40 CFR Part 60, General Provisions, Appendix A (Total Particulate), Part 51 Method 201 or 201A (PM<sub>10</sub>) (ARM 17.8.105 and ARM 17.8.749).
2. If GSM constructs the FOP, additional testing will be triggered as required under 40 CFR 60, Subpart LL (ARM 17.8.340 and 40 CFR 63, Subpart LL).
3. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).
4. The Department may require further testing (ARM 17.8.105).

## C. Operational Reporting Requirements

1. GSM 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). GSM shall submit the following information annually to the Department by March 1 of each year; the information may be submitted along with the annual emission inventory (ARM 17.8.505).

- a. Tons of ore removed (detailed by month)
- b. Tons of waste removed (detailed by month)
- c. Vehicle miles traveled on haul roads
- d. Vehicles miles traveled on access roads
- e. Number of holes drilled
- f. Number of blasts
- g. Tons of ore through primary crusher
- h. Tons of ore through secondary crusher
- i. Tons of ore through tertiary crusher
- j. Current acreage of disturbed area
- k. Current acreage of tailings pond (and percent of tailings pond exposed)
- l. Tons through refinery
- m. Tons through carbon regeneration unit
- n. Tons through fine ore processor, and
- o. Gallons of diesel burned

2. GSM 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*, a 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 start up 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 GSM 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).

#### D. Ambient Monitoring

GSM shall operate an ambient air quality monitoring network as described in Attachment 1 of this permit (ARM 17.8.749).

#### E. Continuous Monitoring

1. GSM shall install, calibrate, maintain, and operate monitoring devices for the continuous measurement of the change in pressure of the gas stream through each wet scrubber. These monitoring devices must be certified by the manufacturer to be accurate within  $\pm 1$  inch of water gauge pressure and must be calibrated on an annual basis in accordance with the manufacturer's instructions (ARM 17.8.749).
2. GSM shall install, calibrate, maintain and operate monitoring devices for the continuous measurement of the scrubbing liquid flow rate to each wet scrubber. These monitoring devices must be certified by the manufacturer to be accurate within  $\pm 5\%$  of design liquid scrubbing flow rate and must be calibrated on at least an annual basis in accordance with the manufacturer's instructions (ARM 17.8.749).
3. GSM shall maintain a file of all measurements from the scrubber liquid flow rate and pressure differential monitoring devices, and performance testing measurements; monitoring device calibration checks and audits; adjustments and maintenance performed on these systems or devices recorded in a permanent form suitable for inspection. The file shall be retained on site for at least 3-years following the date of such measurements and reports. GSM shall supply these records to the Department upon request. Visual observation and recording of the pressure differential and scrubbing liquid flow rate shall be done twice each day (once during each 12-hour shift) by mill personnel (ARM 17.8.749).
4. If the FOP is constructed, GSM shall comply with the applicable monitoring requirements of 40 CFR 60, Subpart LL, which will be different than noted in items 1 thru 3 directly above (ARM 17.8.340 and 40 CFR 60, Subpart LL).

F. Notification

1. GSM shall provide the Department with notification of the particulate source performance tests at least 30 days prior to the scheduled tests (ARM 17.8.106).
2. GSM shall provide notice to the Department within 15 days upon beginning the construction of the FOP (ARM 17.8.749).

Section III: General Conditions

- A. Inspection – GSM 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 (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
- B. Waiver - The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if GSM fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations - Nothing in this permit shall be construed as relieving GSM 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 therefore, 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 Department personnel at the location of the permitted source.
- G. Permit Fees - Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by GSM 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).

Attachment 1

Ambient Air Monitoring Plan  
Barrick Golden Sunlight  
Golden Sunlight Mines, Inc.  
MAQP #1689-08

1. PM<sub>10</sub> data was collected at the GSM mine from 1991-2000. During the 1991-2000 period, the annual means at both sites were less than 60% of the annual standard. For the 24-hour concentrations, three of the annual, maximum 24-hour values fell into the category of 60-80% of the 24-hour standard, with the remainder of the annual, maximum 24-hour values less than 60% of the 24-hour standard. Therefore, in accordance with the October 9, 1998, monitoring guidance statement developed by the Department, GSM discontinued operation of their ambient PM<sub>10</sub> monitors.
2. The Department may require GSM to conduct additional ambient monitoring, if necessary.

Montana Air Quality Permit (MAQP) Analysis  
Barrick Golden Sunlight  
Golden Sunlight Mines Inc.  
MAQP #1689-08

I. Introduction/Project Description

Barrick Golden Sunlight (GSM) operates an existing open pit gold mine and ore processing facility for the beneficiation of gold bearing ore located at Township 2 North, Range 3 West, Jefferson County, Montana at an elevation of 5200 feet mean sea level MSL. The mine and related facilities are located approximately 5 air miles northeast of Whitehall, Montana near the southern end of the Bull Mountains. The nearest PSD Class I areas are the Anaconda Pintler Wilderness 55 miles to the west and Yellowstone National Park 80 miles to the southeast. The closest sensitive area is the Deer Lodge National Forest 3 miles to the north and west.

A. Permitted Equipment

MAQP #1689-08 covers the operations of the GSM gold mine and ore processing facility. Operations include blasting, drilling, crushing, screening, and conveying of material. Emissions are also generated from bulk loading, stockpiles, diesel vehicle exhaust, and haul and access roads.

C. Source Description

GSM operates an open pit gold mine and ore processing facility for the beneficiation of gold bearing ore. Ore is extracted from the mine using conventional open pit mining methods involving drilling, blasting, loading and hauling. The ore is delivered to the mill crushing area where it undergoes 3 stages of crushing, using gyratory and cone crushers followed by wet grinding in rod and ball mills. The ore passes through a leaching process where ore slurry is contacted with dilute sodium cyanide solution to obtain the optimum extraction of gold. The resulting gold bearing solution is sent through a washing circuit. GSM may in the future improve gold recovery through the construction and operation of a Fine Ore Processing unit (FOP). It has been determined that a recoverable quantity of gold remains in the wet slurry tailings generated by the current processing facilities at GSM.

D. Permit History

**MAQP #1499** was originally issued to Placer Amex for the Golden Sunlight Mine by the Montana Department of Health and Environmental Sciences, Air Quality Bureau on November 13, 1980. Placer Dome US, successor in interest to Placer Amex, transferred the permit to Golden Sunlight Inc. (Golden Sunlight) in early 1982.

**MAQP #1689** was issued on July 1, 1982, as an alteration to Golden Sunlight's existing permit. **MAQP #1689 replaced MAQP #1499.** The permit alteration consisted of the following:

- The primary crusher changed from a jaw to a gyratory. The gyratory crusher had a higher ore feed rate; however, Golden Sunlight did not propose to increase production. Therefore, potential uncontrolled emissions for this replacement were unchanged. The gyratory crusher operated fewer hours per day to crush the same amount of ore. This allowed for less handling of stockpiled ore that reduced emissions.

- The coarse screen location was moved within the enclosed secondary crushing building that added another conveyor discharge point to the circuit.
- A coarse ore stockpile was included in the circuit. The material was pre-screened to remove fines.
- Ducon-Mikropul dust collectors were used instead of Jay Turbulaire. Configuration of some of the dust collection was changed. Manufacturer's literature indicated that the dust collection efficiency was improved.
- Natural gas was used rather than propane in the process boiler, carbon reactivation furnace and the bullion furnace. This fuel change had a negligible effect on the emission estimates.

Estimates of potential, uncontrolled particulate matter (PM) emissions increased by 3.7 tons per year (tpy), while estimates of actual, controlled PM emissions decreased by 25.7 tpy, as a result of these alterations.

**MAQP #1689A** was issued on May 26, 1987. Golden Sunlight applied for a permit alteration to increase ore and waste production above the previous permit limit. This alteration was based on a projected ore production and mill throughput of 2,600,000 tpy and a waste production level of 14,900,000 tpy. The previous totals were 1,750,000 tpy of ore and 2,275,000 tpy of waste. The ore production increase was primarily due to a gradual decrease in ore hardness that in turn allowed for an increase in mill throughput using the existing equipment. Waste production also increased due to increases in the overburden stripping ratio. The PM emission inventory was updated using new emission factors. The increase in production and mill throughput resulted in an increase in uncontrolled PM emissions of 378 tpy. The majority of these PM emissions were fugitives, with stack emissions only increasing from 1.6 to 2.3 tpy.

**MAQP #1689A-3** was issued on July 20, 1990, for an increase in the ore and waste production limits.

**MAQP #1689-04** was issued on June 11, 1993, to increase production limits from 17.5 million tons per year (waste - 14.9 million, ore - 2.6 million) to 39.2 million tons per year (waste - 36.7 million, ore - 2.5 million). The acreage of the disturbed areas also increased. The additional disturbed acres were used as sites for tailings, ore storage, and mine waste rock disposal. All other existing equipment, facilities and procedures remained the same. Also, the ambient monitoring requirement for analysis of trace metals was deleted.

**MAQP #1689-05** was issued on June 21, 1998. Golden Sunlight, in a letter dated April 27, 1998, requested a determination on the need for a permit alteration for the installation and operation of an INCO SO<sub>2</sub>/AIR Cyanide Destruction System. Golden Sunlight identified minimal emissions from the INCO system. The INCO system is a single stage, slurry treatment that uses ammonium bisulfide (NH<sub>4</sub>HSO<sub>3</sub>) to destroy cyanide during a retention cycle of approximately 3 hours. The INCO system emits approximately 2.6 ton/day of ammonium (NH<sub>3</sub>). However, NH<sub>3</sub> is not a regulated air pollutant. The INCO system was designed to destroy 223 lb/hour of weak-acid, dissociable cyanide in the mine's tailings

slurry stream (at a discharge rate of 1,897 gallons/minute with 50% solids by weight). The INCO system removes over 99% of the cyanide from the gold plant's tailings slurry leaving a final cyanide concentration in the treated effluent of about 2 ppm.

On May 6, 1998, the Department of Environmental Quality (Department) determined that the INCO Cyanide Destruction System would not require an alteration to MAQP #1689-04 because the proposed changes would not cause any increase in regulated air pollutants. However, the Department modified MAQP #1689-04 and included a description of the INCO system so that the permit would include a complete and accurate account of the mine operations. Also, the Department updated the rule references in the permit. **MAQP #1689-05** replaced MAQP #1689-04.

The Department received a letter, dated December 28, 2000, from Golden Sunlight requesting termination of the ambient air monitoring network. The Department reviewed the ambient air monitoring data following the October 9, 1998, permitting guidance statement. In a letter dated February 28, 2001, the Department agreed to Golden Sunlight's request to terminate the ambient monitoring program, effective April 1, 2001. The permit action updated the monitoring requirements to reflect the termination of the ambient air monitoring network. Also, the permit was updated to reflect the latest organizational format. **MAQP #1689-06** replaced MAQP #1689-05.

**MAQP #1689-07** was issued on June 30, 2010. The permit action addressed the following items:

1. Included the construction and operation of a Fine Ore Processing (FOP) unit. The Department received a letter, dated February 25, 2010, from GSM requesting that MAQP #1689-06 be updated to include the construction and operation of a FOP unit.
2. Changed the permittee name from Golden Sunlight Mines, Inc. to Barrick Golden Sunlight. The Department received a letter on March 12, 2010, to change the permittee name from Golden Sunlight Mines, Inc. to Barrick Golden Sunlight.
3. Increased the ore process rate at GSM. On November 9, 2005, the Department received additional information regarding a proposed increase in the ore process rate at GSM. On November 17, 2005, the Department approved the change as a de minimis action. This permit included the increase in the ore process rate from 2.5 million tons per year (mty) to 3.0 mty.
4. Included changes to the crushing circuit that will eliminate or minimize emissions from the coarse ore stockpile. The Department received a letter dated April 2, 2010, from GSM requesting that MAQP #1689-06 be updated to include changes to the crushing circuit that will eliminate or minimize emissions from the coarse ore stockpile.

#### E. Current Permit Action

The Department of Environmental Quality (Department) received an application on June 9, 2014, from GSM requesting that MAQP #1689-07 be modified to include the addition of a diesel-powered stacker to handle periods whenever the tertiary crusher would be bypassed. In 2007 a tertiary crusher de minimis bypass was approved, however, this current request for modification also includes an increased capacity higher than the earlier de minimis approval. The current permit action will add the additional stacker, modify the description of the crushing circuit, provide a minor administrative correction to Section II.A.14, and update the

permit to reflect the current permit language and rule references used by the Department. Language has also been added to address the possible future construction of a fine ore processing unit (FOP) which would trigger 40 CFR 60, Subpart LL.

#### F. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

## II. Applicable Rules and Regulations

The following are partial quotations 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. Upon request, the Department will provide references for locations 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).

GSM shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited, 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 which, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant which would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner that a public nuisance is created.

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

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
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead, and
10. ARM 17.8.223 Ambient Air Quality Standard for PM<sub>10</sub>.

GSM 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 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, GSM 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 Processes. This rule requires that no person shall cause, suffer, allow, or permit to be discharged into the outdoor atmosphere from any operation, process or activity, particulate matter in excess of the amount shown in this rule.
5. ARM 17.8.322, Sulfur Oxide Emissions-Sulfur in Fuel. This rule requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter 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. This rule incorporates, by reference, 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS). GSM is not considered an NSPS affected facility under 40 CFR 60 and is not subject to the requirements of the following subparts.
  - a. 40 CFR Part 60, Subpart A, General Provisions.
  - b. 40 CFR Part 60, Subpart LL, Metallic Mineral Processing Plants. This subpart requires affected facilities with any stack emissions containing particulate matter to not exceed 0.05 grams per dry standard cubic meter nor to exhibit greater than 7 % opacity, unless the stack emissions are discharged from an affected facility using a wet scrubbing emission control device. Also, any process fugitive emissions are limited to not greater than 10 % opacity. Process operations at this facility do not meet the definition of affected facilities and Subpart LL is not applicable. Even though the modifications to the facility permitted under MAQP #1689-04 (in 1993) did increase emissions, they were exempted because the production rate increase at the existing facility occurred without a capital expenditure by Golden Sunlight. The discovery of ‘softer’ ore reserves allowed for a production increase (and associated air emissions increase) using the existing equipment. If GSM constructs and operates the Fine Ore Processing Unit, the facility will become an “affected facility” and GSM will have additional requirements as noted within this permit. At that time, GSM may request that the Department add those specific requirements for compliance planning purposes.
8. ARM 17.8.341, Emissions Standards for Hazardous Air Pollutants. This source shall comply with the standards and provisions of 40 CFR Part 61, as appropriate.

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. GSM 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 of any pollutant. GSM has a PTE greater than 25 tons per year of PM; 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. GSM 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. GSM submitted an affidavit of publication of public notice for the June 11, June 18, June 24 and July 2, 2014, issues of the *Whitehall Ledger*, a newspaper of general circulation in the town of Whitehall, Jefferson County.
  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 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 GSM 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 17.8.760 Additional Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those applications that require an environmental impact statement.
  12. 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.
  13. 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).
  14. 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.
  15. 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 (PSD), 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 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to the Federal Clean Air Act (FCAA) that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the source's PTE is below 250 tons per year 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. Potential to emit (PTE) > 10 ton/year of any one Hazardous Air Pollutant (HAP), PTE > 25 ton/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule;
  - b. PTE > 100 ton/year of any pollutant; or
  - c. Sources with the PTE > 70 ton/year of PM<sub>10</sub> in a serious PM<sub>10</sub> non-attainment 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 #1689-08 for GSM, the following conclusions were made:
  - a. The facility's PTE is less than 100 ton/year for any pollutant, excluding fugitives.
  - b. The facility's PTE is less than 10 ton/year for any one HAP and less than 25 ton/year of all HAPs.
  - c. This source is not located in a serious PM<sub>10</sub> non-attainment area.
  - d. This facility is not subject to any current NSPS.
  - e. This facility is not subject to any current NESHAP standards.
  - f. This source is not a Title IV affected source, nor a solid waste combustion unit.
  - g. This source is not an EPA designated Title V source.

Based on these facts, the Department has determined that GSM is a minor source of emissions with respect to Title V. Therefore, a Title V operating permit is not required.

### III. BACT Determination

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

#### A. Diesel-Fired Engine(s)

Due to the limited amount of emissions produced by the proposed diesel-fired engine associated with the new stacker and the lack of cost effective add-on controls, add-on controls would be cost prohibitive. The proposed diesel-fired engine is rated as an EPA Tier 4 engine. Therefore, the Department determined that proper operation and maintenance with no add-on controls would constitute BACT for the proposed Tier 4 rated diesel-fired engine.

In addition, any new diesel-fired engine would likely be required to comply with the federal engine emission limitations including, for example, EPA Tier emission standards for non-road engines (40 CFR Part 1039), NSPS emission limitations for stationary compression ignition engines (40 CFR 60, Subpart IIII), or National Emissions Standards for Hazardous Air Pollutant Sources for Reciprocating Internal Combustion Engines (40 CFR 63, Subpart ZZZZ). Therefore, the Department has determined that compliance with applicable federal standards and proper operation and maintenance of the engine constitutes BACT for this engine. BACT for SO<sub>2</sub> emissions shall be satisfied by burning only ultra-low sulfur diesel (15 ppm) as referenced in 40 CFR 89. Appropriately rated EPA Tier emission standards rated models also have low particulate, PM<sub>10</sub>, CO, and VOCs emitted, and it is economically infeasible to require pollution controls on the diesel-fired engine(s) for these additional pollutants. The control options selected have controls and control costs similar to other recently permitted similar sources and are capable of achieving the appropriate emission standards. The proposed diesel-fired engine is certified as EPA Tier 4.

#### B. Process and Fugitive Particulate Emissions

GSM must take reasonable precautions to limit the fugitive emissions of airborne particulate matter on haul roads, access roads, parking lots, and the general plant area including conveyors. Reasonable precautions include treating all unpaved portions of the haul roads, access roads, parking lots, or the general plant area with water and/or chemical dust suppressant, as necessary. Using water and/or chemical dust and covers to comply with the reasonable precautions limitation will be considered BACT. GSM shall also use water spray bars as necessary to maintain compliance with the opacity and reasonable precaution limitations as referenced in Section II.A.5

The control options selected contain control equipment and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

#### IV. Emission Inventory

Particulate Matter (PM) Emissions (tons/year)				
Activity	Uncontrolled PM	Control Measure	% Control	Controlled PM
Topsoil Removal <sup>a</sup>	2.32	None	0	2.32
Topsoil Dumping <sup>a</sup>	2.32	None	0	2.32
Topsoil Stockpiles <sup>a</sup>	17.25	Revegetation	75	4.31
Disturbed Areas <sup>a</sup>	27.55	None	0	27.55
Ore & Waste Drilling <sup>a</sup>	19.50	Water Injection	90	1.95
Ore & Waste Blasting <sup>a</sup>	8.75	Min. Area & Overshoot	0	8.75
Ore & Waste Removal <sup>a</sup>	196	Minimize Fall Distance	0	196.00
Ore & Waste Dumping <sup>a</sup>	196	Minimize Fall Distance	0	196.00
Haul Roads <sup>a</sup>	2,197.22	Watering	50	1,098.61
Access Roads <sup>a</sup>	41.31	Chemical Stabilizer	85	6.20
Coarse Ore Stockpile Discharge <sup>b, c</sup>	181.70	Water Spray	50	85.94
Fine Ore Stockpile Discharge <sup>c</sup>	181.70	Water Spray	50	85.94
Stacker	14.94	Water Spray	50	7.47
<b>Fugitive Emissions Subtotal</b>	<b>3,086.56</b>	<b>--</b>	<b>--</b>	<b>1733.18</b>

Particulate Matter (PM) Emissions (tons/year)				
Activity	Uncontrolled PM	Control Measure	% Control	Controlled PM
Primary Crushing	29.96	Wet Scrubber	99	0.30
Secondary Crushing	41.17	Wet Scrubber	99	0.41
Tertiary Crushing	27.33	Wet Scrubber	99	0.27
Fine Ore Mill Process <sup>d</sup>	15.13	Water spray/bag filters	50/98	7.49
Fine Ore Processing Unit (FOP)	11.43	Filter bag house	98	1.71
Carbon Regeneration Scrubber Stack	6.60	Wet Scrubber	99	0.90
Refining Furnace Scrubber Stack	1.90	Wet Scrubber	99	0.40
Stacker	14.94	Water Spray	50	7.47
<b>Process Emissions Subtotal</b>	<b>133.53</b>	--	--	<b>11.49</b>
<b>Total PM – Fugitive &amp; Process</b>	<b>3220.09</b>	--	--	<b>1744.67</b>

- a. Sources not affected by proposed increases or process modifications.
- b. The proposed modification to the crusher circuit includes the addition of a transfer chute to direct the coarse ore directly to the secondary crusher, eliminating the coarse ore stockpile. If the crushing circuit is modified to eliminate the coarse ore stockpile, it is estimated that a maximum of 10% of the coarse ore may still be diverted into the barricaded area resulting in estimated uncontrolled PM emissions = 18.17 ton/yr rather than 181.7 tpy and uncontrolled PM<sub>10</sub> emissions = 8.59 ton/yr rather than 85.9 tpy.
- c. Coarse ore stockpile and fine ore stockpile emissions were calculated using the predictive equation from AP 42, Sec. 13.2.4. *Aggregate Handling and Storage Piles*, 11/06. Calculated emissions are greater than indicated in previous permit versions. It is assumed that emission factors from AP 42, Table 11.24-2 were utilized to calculate emissions for the stockpiles, resulting in significantly lower rates.
- d. The Fine Ore Mill Process appears to have been inadvertently omitted in permit MAQP#1689-06.

### Primary Crushing process

**Crushing (SCC 3-03-024-05)** ( in acc w/Guidance statement 5/6/94) The emission factors in Tables 11.24-1 and 11.24-2 are for the process operations as a whole.

Maximum Process Rate = 342 ton/hr (Application information)  
Maximum Hours of Operation = 8760 hrs/yr

#### PM Emissions: Based on AP-42

Emission Factor = 0.02 lb/ton (crushing, AP 42, Table 11.24-2,8/82, high moist. ore)  
Control Efficiency = 99 % Wet Scrubber  
Calculation: (342 ton/hr) \* (8760 hrs/yr) \* (0.02 lb/ton) \* (ton/2000 lb) = **29.96** ton/yr  
Calculation: (342 ton/hr)\* (8760 hrs/yr)\* (0.02 lb/ton) \* (ton/2000 lb) \* (1 - 99/100) = **0.30** ton/yr

#### PM<sub>10</sub> Emissions: Based on AP-42

Emission Factor = 0.009 lb/ton (crushing, AP 42, Table 11.24-2,8/82, high moist. ore)  
Control Efficiency = 99 % Wet Scrubber  
Calculation: (342 ton/hr) \* (8760 hrs/yr) \* (0.009 lb/ton) \* (ton/2000 lb) = **13.48** ton/yr  
Calculation: (342 ton/hr)\* (8760 hrs/yr)\* (0.009 lb/ton)\* (ton/2000 lb)\* (1 - 99/100) = **0.13** ton/yr

### Secondary Crushing Process

**Crushing (SCC 3-03-024-06)** ( in acc w/Guidance statement 5/6/94) The emission factors in Tables 11.24-1 and 11.24-2 are for the process operations as a whole.

Maximum Process Rate = 188 ton/hr (Application information)  
Maximum Hours of Operation = 8,760 hrs/yr

#### PM Emissions: Based on AP-42

Emission Factor = 0.05 lb/ton (crushing, AP 42, Table 11.24-2,8/82, high moist. ore)  
Control Efficiency = 99 % Wet Scrubber  
Calculation: (188 ton/hr) \* (8760 hrs/yr) \* (0.05 lb/ton) \* (ton/2000 lb) = **41.17** ton/yr  
Calculation: (188 ton/hr)\* (8760 hrs/yr)\* (0.05 lb/ton)\* (ton/2000 lb)\* (1 - 99/100) = **0.41** ton/yr

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

Based on AP-42

Emission Factor = 0.02 lb/ton (crushing, AP 42, Table 11.24-2,8/82, high moist. ore)  
Control Efficiency = 99 % Wet Scrubber  
Calculation: (188 ton/hr) \* (8760 hrs/yr) \* (0.02 lb/ton) \* (ton/2000 lb) = **16.47** ton/yr  
Calculation: (188 ton/hr)\* (8760 hrs/yr)\* (0.02 lb/ton)\* (ton/2000 lb)\* (1 - 99/100) = **0.16** ton/yr

### Tertiary Crushers

**Crushing (SCC 3-03-024-06)** ( in acc w/Guidance statement 5/6/94) The emission factors in Tables 11.24-1 and 11.24-2 are for the process operations as a whole

Maximum Process Rate = 104 ton/hr (Application information)  
 Maximum Hours of Operation = 8,760 hrs/yr

**PM Emissions:** Based on AP-42

Emission Factor = 0.06 lb/ton (crushing, AP 42, Table 11.24-2,8/82, high moist. ore)  
 Control Efficiency = 99 % Wet Scrubber  
 (104 ton/hr) \* (8760 hrs/yr) \* (0.06 lb/ton) \* (ton/2000 lb) = **27.33** ton/yr  
 (104 ton/hr) \* (8760 hrs/yr) \* (0.06 lb/ton) \* (ton/2000 lb) \* (1 - 99/100) = **0.27** ton/yr

**PM<sub>10</sub> Emissions:** Based on AP-42

Emission Factor = 0.02 lb/ton (crushing, AP 42, Table 11.24-2,8/82, high moist. ore)  
 Control Efficiency = 99 % Wet Scrubber  
 Calculation: (104 ton/hr) \* (8760 hrs/yr) \* (0.02 lb/ton) \* (ton/2000 lb) = **9.11** ton/yr  
 Calculation: (104 ton/hr) \* (8760 hrs/yr) \* (0.02 lb/ton) \* (ton/2000 lb) \* (1 - 99/100) = **0.09** ton/yr

### Coarse Ore Stockpile

Maximum Process Rate = 342 ton/hr (Company information)  
 Maximum Hours of Operation = 8,760 hrs/yr  
 Number of Piles = 1 pile

**PM Emissions:**

Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.

$$\text{Emission Factor} = k (0.0032) * (U/5)^{1.3} * (M / 2)^{-1.4} = 0.121 \text{ lb/ton}$$

Where: k = particle size multiplier = 0.74 (Value for PM < 30 microns per AP 42, Sec. 13.2.4.3, 11/06)  
 U = mean wind speed = 11 mph (application info ltr dated April 2, 2010)  
 M = material moisture content = 0.25 % (Applicant says moisture is low ltr dated April 2, 2010. Value provided in AP 42, Sec. 13.2.4.3, 11/06)  
 Control Efficiency = 50 % (Water or chemical spray)

Calculation: (342 ton/hr) \* (8760 hrs/yr) \* (0.121 lb/ton) \* (ton/2000 lb) = **181.70** ton/yr  
 Calculation: (342 ton/hr) \* (8760 hrs/yr) \* (0.121 lb/ton) \* (ton/2000 lb) \* (1 - 50/100) = **90.85** ton/yr

### Coarse Ore Stockpile (cont.)

#### PM10 Emissions:

Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.

Emission Factor = $k (0.0032) * (U/5)^{1.3} * (M / 2)^{-1.4} =$	0.05737	lb/ton	(Value for PM < 10 microns per AP 42, Sec. 13.2.4.3, 11/06)
Where: k = particle size multiplier =	0.35		(application info, ltr dated April 2, 2010)
U = mean wind speed =	11	mph	(Applicant says moisture is low ltr dated April 2, 2010. Value provided in AP 42, Sec. 13.2.4.3, 11/06)
M = material moisture content =	0.25	%	(Water or chemical spray)
Control Efficiency =	50	%	
Calculation: $(324) * (0.05737 \text{ lb/ton}) * (0.05737 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) =$	<b>85.94</b>	ton/yr	
Calculation: $(324) * (0.05737 \text{ lb/ton}) * (0.05737 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) * (1 - 50/100) =$	<b>42.97</b>	ton/yr	

### Fine Ore Stockpile

Maximum Process Rate = 342 ton/hr (Company information)	342	ton/hr	(Company information)
Maximum Hours of Operation =	8,760	hrs/yr	
Number of Piles = 1 piles	1	pile	

#### PM Emissions:

Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.

Emission Factor = $k (0.0032) * (U/5)^{1.3} * (M / 2)^{-1.4} =$	0.12130	lb/ton	(Value for PM < 30 microns per AP 42, Sec. 13.2.4.3, 11/06)
Where: k = particle size multiplier =	0.74		(application info)
U = mean wind speed =	11	mph	(Applicant says moisture is low. Used value provided in AP 42, Sec. 13.2.4, 11/06)
M = material moisture content =	0.25	%	(Water or chemical spray)
Control Efficiency =	50	%	
Calculation: $(342 \text{ ton/hr}) * (8760 \text{ hrs/yr}) * (0.107 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) =$	<b>181.70</b>	ton/yr	
Calculation: $(342 \text{ ton/hr}) * (8760 \text{ hrs/yr}) * (0.107 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) * (1 - 50/100) =$	<b>90.85</b>	ton/yr	

**Fine Ore Stockpile (cont.)**

**PM10 Emissions:**  
 Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.  
 Emission Factor =  $k (0.0032) * (U/5)^{1.3} * (M / 2)^{-1.4} =$  0.05069 lb/ton  
 Where: k = particle size multiplier = 0.35 (Value for PM < 10 microns per AP 42, Sec. 13.2.4.3, 11/06)  
 U = mean wind speed = 10 mph (Average from values provided in AP 42, Sec. 13.2.4.3, 11/06)  
 M = material moisture content = 0.25 % (Applicant says moisture is low. Used value provided in AP 42, Sec. 13.2.4,11/06)  
 Control Efficiency = 50 % (Water or chemical spray)  
 Calculation:  $(342 \text{ ton/hr}) * (8760 \text{ hr/yr}) * (0.05069 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) =$  **85.94** ton/yr  
 Calculation:  $(342 \text{ ton/hr}) * (8760 \text{ hr/yr}) * (0.05069 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) * (1 - 50/100) =$  **42.97** ton/yr

<b>Fine Ore Mill Process</b>	<b>Uncontrolled</b>		<b>Controlled</b>	
	<b>PM</b>	<b>PM10</b>	<b>PM</b>	<b>PM10</b>
Conveyor Discharge	14.98	5.99	7.49	3.00
Lime Silo 1 - Load	0.11	0.007	0.002	0.0001
Lime Silo 2 - Load	0.05	0.003	0.001	0.0001
Lime Silo 1 - Unload	7.64E-04	3.60E-04	1.53E-05	7.19E-06
Lime Silo 2 - Unload	3.28E-04	1.55E-04	6.57E-06	3.09E-06
<b>Total</b>	<b>15.13</b>	<b>6.00</b>	<b>7.49</b>	<b>3.00</b>

**Fine Ore Mill - Conveyor discharge - to Fine Ore Mill (SCC30-03-024-08)**

Maximum Process Rate = 342 ton/hr (Company information.)  
 Maximum Hours of Operation = 8,760 hrs/yr

**PM Emissions:**  
 Emission Factor = 0.01 lb/ton mat'l handling, AP 42, Table 11.24-2,8/82, high moist ore)  
 Control Efficiency = 50 % (Water or chemical spray)  
 Calculation:  $(8,760 \text{ hrs/yr}) * (342 \text{ ton/hr}) * (\text{ton}/2000 \text{ lb}) * (0.01 \text{ lb/ton}) =$  **14.98** ton/yr  
 Calculation:  $(8,760 \text{ hrs/yr}) * (342 \text{ ton/hr}) * (\text{ton}/2000 \text{ lb}) * (0.01 \text{ lb/ton}) * (1 - 50/100) =$  **7.49** ton/yr

**PM10 Emissions:**

Emission Factor = 0.004 lb/ton mat'l handling, AP 42, Table 11.24-2,8/82, high moist. ore)  
Control Efficiency = 50 % (Water or chemical spray)  
Calculation: (8,760 hrs/yr) \* (342 ton/hr) \* (ton/2000 lb) \* (0.004 lb/ton) = **5.99** ton/yr  
Calculation: (8,760 hrs/yr)\* (342 ton/hr)\* (ton/2000 lb)\* (0.004 lb/ton)\* (1 - 50/100) = **3.00** ton/yr

**Fine Ore Mill - Silo Load (SCC 3-05-002-13) Silo 1**

Maximum Process Rate = 0.0342 ton/hr (from applicant)  
Maximum Hours of Operation = 8,760 hrs/yr

**Total PM Emissions:**

Emission Factor = 0.72 lb/ton (AP-42, Table 11.12-2, 6/06, Cement unloading/pneum.)  
Control Efficiency = 98 % from applicant, bag filters  
Calculation: (8,760 hrs/yr) \* (0.0342 ton/hr) \* (0.72 lb/ton) \* (ton/2000 lb) = **0.108** ton/yr  
Calculation: (8,760 hrs/yr)\* (0.0342 ton/hr)\* (0.72 lb/ton)\* (ton/2000 lb)\* (1 - 98/100) = **0.002** ton/yr

**Total PM10 Emissions:**

Emission Factor = 0.046 lb/ton (AP-42, Table 11.12-2, 6/06, Cement unloading/pneum.)  
Control Efficiency = 98 %  
Calculation: (8,760 hrs/yr) \* (0.0342 ton/hr) \* (0.046 lb/ton) \* (ton/2000 lb) = **0.007** ton/yr  
Calculation: (8,760 hrs/yr)\* (0.0342 ton/hr)\* (0.046 lb/ton)\* (ton/2000 lb)\* (1 - 98/100) = **0.0001** ton/yr

**Fine Ore Mill - Silo Load (SCC 3-05-002-13) Silo 2**

Maximum Process Rate = 0.0147 ton/yr (from applicant)  
Maximum Hours of Operation = 8,760 hrs/yr

**Total PM Emissions:**

Emission Factor = 0.72 lb/ton (AP-42, Table 11.12-2, 6/06, Cement unloading/pneum.)  
Control Efficiency = 98 % from applicant, bag filters  
Calculation: (8,760 hrs/yr) \* (0.0147 ton/yr) \* (0.72 lb/ton) \* (ton/2000 lb) = **0.046** ton/yr  
Calculation: (8,760 hrs/yr)\* (0.0147 ton/yr)\* (0.72 lb/ton)\* (ton/2000 lb)\* (1 - 98/100) = **0.001** ton/yr

**Total PM10 Emissions:**

Emission Factor = 0.046 lb/ton (AP-42, Table 11.12-2, 6/06, Cement unloading/pneum.)  
Control Efficiency = 98 %  
Calculation: (8,760 hrs/yr) \* (0.0147 ton/yr) \* (0.046 lb/ton) \* (ton/2000 lb) = **0.003** ton/yr  
Calculation: (8,760 hrs/yr)\* (0.0147 ton/yr)\* (0.046 lb/ton)\* (ton/2000 lb)\* (1 - 98/100) = **0.0001** ton/yr

**Fine Ore Mill - Silo discharge (SCC 3-05-002-13) Silo 1**

Maximum Process Rate = 0.0342 ton/hr (from applicant)  
Maximum Hours of Operation = 8,760 hrs/yr

**Total PM Emissions:**

Emission Factor = 0.0051 lb/ton (AP-42, Table 11.12-2, 6/06. Weigh Hopper loading. Applicant states lime is a gravelly mat'l. Not as light and dusty as cement)  
Control Efficiency = 98 %  
Calculation: (0.0342 ton/hr) \* (8760 hrs/yr) \* (0.0051 lb/ton) \* (ton/2000 lb) = **0.00076** ton/yr  
Calculation: (8,760 hrs/yr)\*(0.0147 ton/yr)\*(0.0051 lb/ton)\*(ton/2000 lb)\*(1 - 98/100)= **1.53E-05** ton/yr

**Total PM10 Emissions:**

Emission Factor = 0.0024 lb/ton (AP-42, Table 11.12-2, 6/06. Weigh Hopper loading.)  
Control Efficiency = 98 %  
Calculation: (0.0342 ton/hr) \* (8760 hrs/yr) \* (0.0024 lb/ton) \* (ton/2000 lb) = **0.00036** ton/yr  
Calculation: (8,760 hrs/yr)\*(0.0147 ton/yr)\*(0.0024 lb/ton)\*(ton/2000 lb)\*(1 - 98/100)= **7.19E-06** ton/yr

**Fine Ore Mill - Silo discharge (SCC 3-05-002-13) Silo 2**

Maximum Process Rate = 0.0147 ton/yr (from applicant)  
Maximum Hours of Operation = 8,760 hrs/yr

**Total PM Emissions:**

Emission Factor = 0.0051 lb/ton (AP-42, Table 11.12-2, 6/06. Weigh Hopper loading.)  
Control Efficiency = 98 %  
Calculation: (8,760 hrs/yr) \* (0.0147 ton/yr) \* (0.0051 lb/ton) \* (ton/2000 lb) = **0.0003** ton/yr  
Calculation: (8,760 hrs/yr)\*(0.0147 ton/yr)\*(0.0051 lb/ton)\*(ton/2000 lb)\*(1 - 98/100)= **6.57E-06** ton/yr

**Total PM10 Emissions:**

Emission Factor = 0.0024 lb/ton (AP-42, Table 11.12-2, 6/06. Weigh Hopper loading.)  
Control Efficiency = 98 %  
Calculation: (8,760 hrs/yr) \* (0.0147 ton/yr) \* (0.0024 lb/ton) \* (ton/2000 lb) = **0.0002** ton/yr  
Calculation: (8,760 hrs/yr)\*(0.0147 ton/yr)\*(0.0024 lb/ton)\*(ton/2000 lb)\*(1 - 98/100)= **3.09E-06** ton/yr

<b>Fine Ore Processing Unit (FOP)</b>				
Calculated using the emission factors from AP42 Chapter 13, Miscellaneous Sources. Assuming controlled emissions with filter baghouse (99% eff)				
Maximum Process Rate:	30	tons/hr		
Maximum Hours of Operation:	8,760	hrs/yr		
Output:	262,800	tons		
<b>Non-Fugitive Sources</b>	<b>tons/yr</b>	<b>tons/yr</b>	<b>PM10 (uncntrl'd)</b>	<b>PM10 (cntrl'd)</b>
<b>Emission Source</b>	<b>PM (uncntrl'd)</b>	<b>PM (cntrl'd)</b>	<b>PM10 (uncntrl'd)</b>	<b>PM10 (cntrl'd)</b>
Fine Ore Concentrate Piles within building	1.51E-02	3.03E-04	7.16E-03	1.43E-04
Truck loading within building	1.51E-02	3.03E-04	7.16E-03	1.43E-04
Haul Roads	11.40	1.71	2.94	0.44
<b>Total Emissions</b>	<b>11.43</b>	<b>1.71</b>	<b>2.96</b>	<b>0.44</b>

<b>FOP Piles</b>			
Process: Fugitive emissions from fine ore concentrate storage piles. Calculated using the emission factors from AP42 Chapter 13, Miscellaneous Sources.			
Maximum Process Rate =	30	ton/hr	(Maximum plant process rate)
Maximum Hours of Operation =	8,760	hrs/yr	
Number of Piles =	1	pile	
<b>PM Emissions:</b>			
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.			
Emission Factor = $k (0.0032) * (U/5)^{1.3} * (M / 2)^{-1.4}$ =	0.00012	lb/ton	Value for PM < 30 microns per AP 42, Sec. 13.2.4.3, 11/06 (Inside building) (10% Provided by company. Assume some drying in piles to 7.4%.) (Filter bag house)
k = particle size multiplier =	0.74		
U = mean wind speed =	2	mph	
M = material moisture content =	7.4	%	
Control Efficiency = 98%	98	%	
Calculation: $(30 \text{ ton/hr}) * (8760 \text{ hrs/yr}) * (0.00012 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) * (1 \text{ pile})$ =	<b>1.51E-02</b>	ton/yr	
Calculation: $(30 \text{ ton/hr}) * (8760 \text{ hrs/yr}) * (0.00012 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) * (1 - 98/100)$ =	<b>3.03E-04</b>	ton/yr	

**FOP Piles (cont.)**

<b>PM10 Emissions:</b>			
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.			
Emission Factor = $k (0.0032) * (U/5)^{1.3} * (M / 2)^{-1.4} =$	0.00005	lb/ton	Value for PM < 10 microns per AP 42, Sec. 13.2.4.3, 11/06 (Provided by company for average Butte windspeed) (10% Provided by company. Assume some drying in piles to 7.4%.) (Filter bag house)
k = particle size multiplier =	0.35		
U = mean wind speed =	2	mph	
M = material moisture content =	7.4	%	
Control Efficiency =	98	%	
Calculation: $(30 \text{ ton/hr}) * (8760 \text{ hrs/yr}) * (0.00005 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) * (1 \text{ pile}) =$	<b>7.16E-03</b>	ton/yr	
Calculation: $(30 \text{ ton/hr}) * (8760 \text{ hrs/yr}) * (0.00005 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) * (1 - 98/100) =$	<b>1.43E-04</b>	ton/yr	

<b>FOP Concentrate truck loading</b>			
Maximum Process Rate =	30	ton/hr	(Company Information)
Maximum Hours of Operation =	8,760	hrs/yr	
<b>Total PM Emissions:</b> Predictive equation for emission factor provided per AP 42, Table 13.2.4.3, 11/06.			
Emission Factor = $k * 0.0032 * [(U/5)^{1.3} / ((M/2)^{1.4})] =$	0.00012	lb/ton	(PM<30 µm value per AP-42, 13.2.4-4, 11/06) (Inside building) (10% Provided by company. Assume some drying in piles to 7.4%.) (assumed) (Filter bag house)
k = particle size multiplier =	0.74		
U = mean wind speed =	2	mph	
M = material moisture content =	7.4	%	
Control Efficiency =	98	%	
Calculation: $(30 \text{ ton/hr}) * (8760 \text{ hrs/yr}) * (0.00012 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) =$	<b>1.51E-02</b>	ton/yr	
Calculation: $(30 \text{ ton/hr}) * (8760 \text{ hrs/yr}) * (0.00012 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) * (1 - 98/100) =$	<b>3.03E-04</b>	ton/yr	
<b>Total PM10 Emissions:</b> Predictive equation for emission factor provided per AP 42, Table 13.2.4.3, 11/06.			
Emission Factor = $k * 0.0032 * [(U/5)^{1.3} / ((M/2)^{1.4})] =$	0.00005	lb/ton	(PM<30 um value per AP-42, 13.2.4-4, 11/06) (Inside building) Assume some drying in piles to 7.4% (assumed) (Filter bag house)
k = particle size multiplier =	0.35		
U = mean wind speed =	2	mph	
M = material moisture content =	7.4	%	
Control Efficiency = 98%	98	%	
Calculation: $(30 \text{ ton/hr}) * (8760 \text{ hrs/yr}) * (0.00005 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) =$	<b>7.16E-03</b>	ton/yr	
Calculation: $(30 \text{ ton/hr}) * (8760 \text{ hrs/yr}) * (0.00005 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) * (1 - 98/100) =$	<b>1.43E-04</b>	ton/yr	

<b>FOP Haul Roads - (Empty Truck)</b>			
Vehicle Miles Traveled (VMT) per Day =	10	VMT/day	(company information. 1/2 mi road, 10 loads/day)
VMT per year = (10 VMT/day) * 365 days/yr * 0.5 =	1,825	VMT/yr	(half the trips with empty truck)
<b>PM Emissions:</b>			
Predictive equation for emission factor, unpaved roads, industrial sites per AP 42, Ch. 13.2.2, 11/06.			
Emission Factor = $k * (s / 12)^a * (W / 3)^b =$	3.39	lb/VMT	
k = constant =	4.9	lbs/VMT	(Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content =	5.1	%	(company information)
W = mean vehicle weight =	5	tons	(company information)
a = constant =	0.7		(Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant =	0.45		(Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency =	85	%	(Company info - Water spray w/ chemical dust suppressant)
Calculation: (1,825 VMT/yr) * (3.39 lb/VMT) * (ton/2000 lb) =	3.09	tons/yr	(Uncontrolled Emissions)
Calculation: (1,825 VMT/yr)*(3.38766 lb/VMT)*(ton/2000 lb)*(1 - 85/100) =	0.46	tons/yr	(Apply 85% control efficiency)
<b>PM10 Emissions:</b>			
Predictive equation for emission factor, unpaved roads, industrial sites per AP 42, Ch. 13.2.2, 11/06.			
Emission Factor = $k * (s / 12)^a * (W / 3)^b =$	0.87	lb/VMT	
k = constant =	1.5	lbs/VMT	(Value for PM10, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content =	5.1	%	(company information)
W = mean vehicle weight =	5	tons	(company information)
a = constant =	0.9		(Value for PM10, AP 42, Table 13.2.2-2, 11/06)
b = constant =	0.45		(Value for PM10, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency =	85	%	(Company info - Water spray w/ chemical dust suppressant)
Calculation: (1,825 VMT/yr) * (0.87 lb/VMT) * (ton/2000 lb) =	0.80	tons/yr	(Uncontrolled Emissions)
Calculation: (1,825 VMT/yr) * (0.87 lb/VMT) * (ton/2000 lb) * (1 - 85/100) =	0.12	tons/yr	(Apply 85% control efficiency)

**FOP Haul Roads -(Full Truck)**

Vehicle Miles Traveled (VMT) per Day = 10 VMT/day (company information. 1/2 mi road, 10 loads/day)  
 VMT per year = (10 VMT/day) \* 365 days/yr \* 0.5 = 1,825 VMT/yr (half the trips with full truck)

**PM Emissions:**

Predictive equation for emission factor, unpaved roads, industrial sites per AP 42, Ch. 13.2.2, 11/06.

Emission Factor = $k * (s / 12)^a * (W / 3)^b$ =	9.11	lb/VMT	
k = constant =	4.9	lbs/VMT	(Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content =	5.1	%	(company information)
W = mean vehicle weight =	45	tons	(company information)
a = constant =	0.7		(Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant =	0.45		(Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency =	85	%	(Company info - Water spray w/ chemical dust suppressant)
Calculation: (1,825 VMT/yr) * (9.11 lb/VMT) * (ton/2000 lb) =	<b>8.31</b>	tons/yr	(Uncontrolled Emissions)
Calculation: (1,825 VMT/yr) * (9.11 lb/VMT) * (ton/2000 lb) * (1 - 85/100) =	<b>1.25</b>	tons/yr	(Apply 85% control efficiency)

**PM10 Emissions:**

Predictive equation for emission factor, unpaved roads, industrial sites per AP 42, Ch. 13.2.2, 11/06

Emission Factor = $k * (s / 12)^a * (W / 3)^b$ =	2.35	lb/VMT	
k = constant =	1.5	lbs/VMT	(Value for PM10, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content =	5.1	%	(company information)
W = mean vehicle weight =	45	tons	(company information)
a = constant =	0.9		(Value for PM10, AP 42, Table 13.2.2-2, 11/06)
b = constant =	0.45		(Value for PM10, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency =	85	%	(Company info - Water spray w/ chemical dust suppressant)
Calculation: (1,825 VMT/yr) * (2.35 lb/VMT) * (ton/2000 lb) =	<b>2.14</b>	tons/yr	(Uncontrolled Emissions)
Calculation: (8 tons/yr) * (2.35 lb/VMT) * (ton/2000 lb) * (1 - 85/100) =	<b>0.32</b>	tons/yr	(Apply 85% control efficiency)

**sub-total HAUL ROADS**

PM uncontrolled	11.40	tons/yr
PM controlled	1.71	tons/yr
PM10 uncontrolled	2.94	tons/yr
PM10 controlled	0.44	tons/yr

<b>Stacker Addition</b>			
<b>#7 Belt Discharge (1 transfer point) and New Stacker (2 Transfer Points)</b>			
Maximum Process Rate =	379	ton/hr	(Company information. Reject rate from secondary crusher is limited to 379 tph which is below the rating of the stacker )
Maximum Hours of Operation =	8,760	hrs/yr	
<b>PM Emissions:</b>			
Emission Factor =	0.003	lb/ton	Mat'l handling/transfer, AP 42, Table 11.19.2-2,
Control Efficiency =	50	%	(Water spray)
Calculation: (379 ton/hr) * (8760 hrs/yr) * (ton/2000 lb) * (0.003 lb/ton) * 3 transfer points =	<b>14.94</b>	ton/yr	
Calculation: (379 ton/hr) * (8760 hrs/yr) * (ton/2000 lb) * (0.003 lb/ton) * (1 - 50/100)*3 =	<b>7.47</b>	ton/yr	
<b>PM10 Emissions:</b>			
Emission Factor =	0.001	lb/ton	Mat'l handling/transfer, AP 42, Table 11.19.2-2,
Control Efficiency = 50% (Water spray)	50	%	(Water spray)
Calculation: (379 ton/hr) * (8760 hrs/yr) * (ton/2000 lb) * (0.001 lb/ton)* 3 transfer points =	<b>5.48</b>	ton/yr	
Calculation: (379 ton/hr) * (8760 hrs/yr) * (ton/2000 lb) * (0.001 lb/ton) * (1 - 50/100) = *3	<b>2.74</b>	ton/yr	

Diesel Generator (Up to 48 hp)				
Engine Rating:	48 hp	Diesel Generator Engine		
Operating Hours:	8760 hrs/yr			
<b>Particulate Emissions:</b>				
PM Emissions:				
Emission Factor	0.0022 lb/hp-hr	[AP-42 3.3-1, 10/96]		
Calculations	(0.0022 lb/hp-hr) * (hp) =		0.11 lbs/hr	
	(0.11 lbs/hr) * (8760 hrs/yr) * (0.0005 tons/lb) =		0.46	TPY
PM <sub>10</sub> Emissions:				
Emission Factor	0.0018 lb/hp-hr	[AP-42 3.3-1, 6/06]		
Calculations	(0.0018 lb/hp-hr) * (hp) =		0.08 lbs/hr	
	(0.08 lbs/hr) * (hrs/yr) * (0.0005 tons/lb) =		0.37	TPY
PM <sub>2.5</sub> Emissions:				
Emission Factor	0.0018 lb/hp-hr	[AP-42 3.3-1, 10/96]		
Calculations	(0.0018 lb/hp-hr) * (hp) =		0.08 lbs/hr	
	(0.08 lbs/hr) * (hrs/yr) * (0.0005 tons/lb) =		0.37	TPY
<b>CO Emissions:</b>				
Emission Factor	0.00668 lb/hp-hr	[AP-42 3.3-1, 6/06]		
Calculations	(0.00668 lb/hp-hr) * (hp) =		0.32 lbs/hr	
	(0.32 lbs/hr) * (hrs/yr) * (0.0005 tons/lb) =		1.40	TPY
<b>NOx Emissions:</b>				
Emission Factor	0.0085 lb/hp-hr	[Vendor Information]		
Calculations	(0.0085 lb/hp-hr) * (hp) =		0.41 lbs/hr	
	(0.41 lbs/hr) * (hrs/yr) * (0.0005 tons/lb) =		1.79	TPY
<b>SOx Emissions:</b>				
Emission Factor	0.00205 lb/hp-hr	[AP-42 3.3-1, 6/06]		
Calculations	(0.0021 lb/hp-hr) * (hp) =		0.10 lbs/hr	
	(0.10 lbs/hr) * (hrs/yr) * (0.0005 tons/lb) =		0.43	TPY
<b>VOC Emissions:</b>				
Emission Factor	0.00251 lb/hp-hr	[AP-42 3.3-1, 6/06]		
Calculations	(0.0025 lb/hp-hr) * (hp) =		0.12 lbs/hr	
	(0.12 lbs/hr) * (hrs/yr) * (0.0005 tons/lb) =		0.53	TPY

## V. Existing Air Quality

MAQP #1689A required ambient monitoring for total suspended particulate matter (TSP) and metals (lead, cadmium, arsenic, zinc). However, one TSP sample exceeded the 24-hour PM<sub>10</sub> standard (150 µg/m<sup>3</sup>). Based on Department policy, sampling changed from TSP to PM<sub>10</sub> samplers in 1991 under the conditions of MAQP #1689A-3. The metals concentrations were below the Department's guideline values and the metals analysis requirement was deleted in MAQP #1689-04.

Prior to this permitting action, the Department reviewed GSM's request, dated December 28, 2000, to terminate the ambient PM<sub>10</sub> monitoring program. The review followed the Department's October 1998 Monitoring Requirements Guidance Statement and covered the PM<sub>10</sub> data collected since the TSP sampler changeover in 1991 through the third quarter of 2000.

During the 1991-2000 period, the annual means at both sites were less than 60% of the annual standard (50 µg/m<sup>3</sup>). For the 24-hour concentrations, three of the annual, maximum 24-hour values fell into the category of 60-80% of the 24-hour standard, with the remainder of the annual, maximum 24-hour values less than 60% of the 24-hour standard. For the three 24-hour maximum concentrations that fell into the 60-80% category, two of them were measured during the forest fires of 2000. Data collected at PM-2.5 monitoring sites in the region on the same date (8/7/00) as the two elevated PM<sub>10</sub> samples from GSM revealed very high concentrations of fine particles. This strongly indicates that there were substantial effects from forest fire smoke on the GSM PM<sub>10</sub> samples on August 7, 2000. Therefore, these two samples could not reasonably be attributed to emission sources at GSM. The third, maximum 24-hour sample in the 60-80% category was collected in 1991. Given the lack of historical records and the length of time that elapsed since this sample was collected, the Department could not positively identify the emission sources that contributed to this elevated sample. Therefore, due to the relatively low concentrations of PM<sub>10</sub> in the ambient air around the mine, the Department agreed to GSM's request to terminate the ambient air-monitoring network.

## VI. Air Quality Impact Analysis

GSM previously submitted dispersion modeling analyses of the impacts from the changes proposed for MAQP #1689-04 and discussed the results from their ambient monitoring network. These analyses showed compliance with the applicable ambient air quality standard.

The Department believes the increase in emissions for the current permit change will not cause or contribute to a violation of any ambient air quality standard. The current permit change increases the potential to emit by only 14.9 tons per year of PM for uncontrolled and 7.5 tons of controlled emissions. The Tier 4 rated diesel engine at 48 horsepower results in only 1.8 tons per year of NO<sub>x</sub>.

## 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	
X		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	X	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	X	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	X	4. Does the action deprive the owner of all economically viable uses of the property?
	X	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?
	X	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	X	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?
	X	7a. Is the impact of government action direct, peculiar, and significant?
	X	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	X	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?
	X	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: Craig Henrikson

Date: June 24, 2014

**DEPARTMENT OF ENVIRONMENTAL QUALITY**

**Permitting and Compliance Division  
Air Resources Management Bureau  
P.O. Box 200901, Helena, MT 59620  
(406) 444-3490**

**FINAL ENVIRONMENTAL ASSESSMENT (EA)**

**Issued To:** *Golden Sunlight Mines Inc.  
453 MT Hwy 2 East  
Whitehall, MT 59759*

**Montana Air Quality Permit Number:** *1689-08*

**Preliminary Determination Issued:** *07/8/2014*

**Department Decision Issued:** *07/24/2014*

**Permit Final:** *08/09/2014*

1. *Legal Description of Site:* Golden Sunlight Mines Inc. (GSM) submitted an application for the addition of diesel-fired stacker at the existing facility located in Township 2 North, Range 3 West, in Section 29 in Jefferson County, Montana.
2. *Description of Project:* The permit application is for the addition of a diesel-fired stacker which would provide means to bypass the tertiary crusher. The discharge rate from the secondary crusher is limited to 379 tons per hour and accordingly the maximum throughput rate for the proposed diesel-fired stacker is limited to 379 tons per hour. .
3. *Objectives of Project:* The objective of the project would be to provide flexibility in the crushing circuit if the tertiary crusher were to fail and also to provide flexibility for crushing operations.
4. *Alternatives Considered:* In addition to the proposed action, the Department considered the "no-action" alternative. The "no-action" alternative would deny issuance of the MAQP for the proposed modification. However, the Department does not consider the "no-action" alternative to be appropriate because GSM would be expected to operate all equipment in 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 listing of the enforceable permit conditions and a permit analysis, including a Best Available Control Technology (BACT) analysis, is included in this permit action.
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 the permit conditions would be reasonably necessary to ensure compliance with applicable requirements and to demonstrate compliance with those requirements and would 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.

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

The operation of the proposed diesel-fired stacker would have minor impacts upon the terrestrial and aquatic life and habitats in areas where the facility may operate. Although air pollutant deposition would occur in the areas where the equipment would operate, the size and nature of the operation, dispersion characteristics of pollutants, and conditions placed in MAQP #1698-08 would result in minor impacts as the site is an existing open pit gold mine. Therefore, the operation of the equipment would present minor impacts on terrestrial and aquatic life is present in the area of potential operation.

B. Water Quality, Quantity, and Distribution

Although there would be a small increase in air emissions in the area where the stacker would operate, there would only be minor impacts on water quality, quantity, and distribution because of the nature, size, operational requirements, and conditions placed in MAQP #1689-08 for the facility. Further, as described in Section 7.F. of this EA, the Department determined that any impacts from deposition of pollutants would be minor. In addition, any accidental spills or leaks from equipment would be required to be handled according to the appropriate environmental regulations in an effort to minimize any potential adverse impact on the immediate and surrounding area. Overall, the operation of the equipment would have minor impacts to water quality, quantity, and distribution in the area of operations.

C. Geology and Soil Quality, Stability, and Moisture

As a result of the operation of the diesel-fired stacker, there would be minor impacts to the geology and soil quality, stability, and moisture near the equipment's operational area because of the increased deposition of pollutants from the stacker. As explained in Section 7.F. of this EA, the facility's size, operational requirements, nature of the operation being located at an existing open pit mine and conditions placed in MAQP #1689-08 would minimize the impacts from deposition.

D. Vegetation Cover, Quantity, and Quality

The operation of the diesel-fired stacker would result in no impacts to the vegetative cover, quantity, and quality because the proposed operation would be located at the existing open pit mine. As explained in Section 7.F. of this EA, the Department determined that, due to the nature of the operation, conditions placed in MAQP #1689-08, and dispersion characteristics of the emissions, any impacts from deposition would not be expected. In addition, because the water usage would be limited to use in particulate control (as described in Section 7.B. of this EA) and presence at the existing open pit mine (as described in Section 7.C. of this EA), corresponding vegetative impacts from water and soil disturbance would not occur.

E. Aesthetics

The diesel-fired stacker would be visible and would create noise in the areas where it would operate. MAQP #1689-08 would include conditions to control emissions (including visible emissions) from the equipment and the surrounding work area. The diesel-fired stacker would be a minor addition to the existing equipment. The diesel-fired stacker would be located with other existing equipment and therefore, any aesthetic impact would be minor.

F. Air Quality

Air quality impacts from the diesel-fired stacker would be minor because emissions from the stacker would be relatively small when controls are applied to the equipment. Dispersion and deposition of pollutants would occur from the operation of the stacker; however, the Department determined that any air quality impacts from the pollutants would be minor due to dispersion characteristics (from factors such as wind speed and wind direction) and conditions placed in MAQP #1689-08.

MAQP #1689-08 would include conditions limiting opacity from the stacker and would require that reasonable precautions be taken to control emissions from haul roads, access roads, parking lots, or the general work area. In addition, the permit would also limit total emissions from the stacker and any additional equipment operated at the same site to 250 tons per year or less.

G. Unique Endangered, Fragile, or Limited Environmental Resources

Issuance of this permit would increase emissions to the atmosphere at the existing open pit mine. However, the emission increases associated with the proposed diesel-fired stacker are considered minor. As explained in Section 7.F. of this EA, because of the

nature of the diesel-fired stacker and conditions placed in MAQP #1689-08, any impacts to unique endangered, fragile, or limited environmental resources from the deposition of pollutants would not be expected given the location of the proposed stacker at the existing open pit mine.

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

Water would be used on particulate emissions at equipment transfer points, haul roads, access roads, parking lots, or the general plant property, as necessary, to control dust resulting from the facility. The diesel-fired stacker would consume energy from diesel fuel, a non-renewable resource. Therefore, any impacts on the demands of the environmental resources of water, air, and energy would be minor.

I. Historical and Archaeological Sites

Given the proposed site is an existing open pit mine, no impact to historical or archaeological sites would likely occur. No new land disturbance is expected with the addition of the proposed stacker. Therefore, it is unlikely that the project would affect any historic or archaeological site and no resulting impacts would be expected.

J. Cumulative and Secondary Impacts

The operation of the diesel-fired stacker would cause minor effects to the physical and biological environment because the stacker would result in a small increase in emissions. However, the addition of the stacker to the existing permitted equipment would have a minor impact versus the operation of the entire facility. The permits would address the environmental impacts associated with the stacker at the existing open pit mine

The diesel-fired stacker would be limited by MAQP #1689-08 to total emissions of 250 tons/year or less from non-fugitive operations and any other additional equipment used at any given site.

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.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				X		Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production				X		Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities				X		Yes
G	Quantity and Distribution of Employment				X		Yes
H	Distribution of Population				X		Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity				X		Yes
K	Locally Adopted Environmental Plans and Goals					X	Yes
L	Cumulative and Secondary Impacts			X			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 operation of the diesel-fired stacker would not likely alter or disrupt any local lifestyles or communities (social structures and mores) in the area of operation because the limited operation of the facility and use in the existing open pit mine.

B. Cultural Uniqueness and Diversity

The operation of the diesel-fired stacker would have no impact on the cultural uniqueness and diversity because the equipment operations would be at a site which is an existing open pit mine.

C. Local and State Tax Base and Tax Revenue

The proposed operation of the diesel-fired stacker would minor impact on local and state tax base and tax revenue as the operation is very small in size. No new jobs are expected to be created with the addition of the diesel-fired stacker.

D. Agricultural or Industrial Production

No impact on agricultural or industrial production would occur as the proposed site for the stacker would be located at the existing open pit mine.

E. Human Health

MAQP #1689-08 would incorporate conditions to ensure that the facility would be operated in compliance with all applicable rules and standards. These rules and standards are designed to be protective of human health. As described in Section 7.F. of this EA, the Department determined that any impacts from deposition of pollutants would be minor due to dispersion characteristics and conditions placed in MAQP #1689-08. The air emissions from this facility would be minimized by opacity limitations on the stacker facility and the surrounding area of operation.

F. Access to and Quality of Recreational and Wilderness Activities

The stacker will be located on previously disturbed ground, and in an existing open pit mine and therefore does not impact access to recreational and wilderness activities.

G. Quantity and Distribution of Employment

Given the relatively small change in capacity with the addition of the stacker, it is not expected that the activities from the operation of the facility would significantly affect the quantity and distribution of employment in any given area. No new jobs are expected to be created to operate the proposed equipment.

H. Distribution of Population

Given the relatively small change in capacity with the addition of the stacker, it is not expected that the activities from operation of the facility would disrupt the normal population distribution of any given area. No secondary activities are identified to move to the current proposed area as a result of the current project.

I. Demands of Government Services

Government services may be required for acquiring the appropriate permits and ensuring compliance with the permits that are issued; however, the government services required would be minor.

J. Industrial and Commercial Activity

The operation of the proposed diesel-fired stacker would represent only a minor increase in the industrial activity in the area. No additional industrial or commercial activities are identified from the operation of the stacker and secondary activities are not expected from the limited operation facility. Therefore, no industrial and commercial activity resulting from the current permit action is expected.

K. Locally Adopted Environmental Plans and Goals

The Department is unaware of any locally adopted environmental plans or goals site that the facility may be operated at under MAQP #1689-08. The conditions identified in MAQP #1689-08 would apply to operation of the stacker at the proposed initial site as well as any other location in Montana as described in Section 1 of this EA.

L. Cumulative and Secondary Impacts

Overall, the cumulative and secondary social and economic impacts from this project would be minor because the addition of the proposed stacker is a minor addition to the existing site. No new businesses are expected to be drawn to the area as a result of the operation. In addition, any social and economic impacts that are created would be minor because of the relatively small size and nature of the operation.

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

*If an EIS is not required, explain why the EA is an appropriate level of analysis:* Because this crushing and screening facility is relatively small in size and must use reasonable precautions to control emissions, any impacts created would be minor impacts.

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*

Individuals or groups contributing to this EA: *Department of Environmental Quality – Air Resources Management Bureau.*

EA Prepared by: Craig Henrikson

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