



Montana Department of  
**E**NVIRONMENTAL **Q**UALITY

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January 31, 2012

Randy Weimer – Environmental Manager  
Stillwater Mining Company – Nye Facility  
2562 Nye Road  
Nye, Montana 59061

Dear Mr. Weimer:

Montana Air Quality Permit #2459-15 is deemed final as of January 31, 2012, by the Department of Environmental Quality (Department). This permit is for an underground platinum/palladium 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,

Vickie Walsh  
Air Permitting Program Supervisor  
Air Resources Management Bureau  
(406) 444-9741

Ed Warner  
Environmental Engineer  
Air Resources Management Bureau  
(406) 444-2467

VW:EW  
Enclosure

Montana Department of Environmental Quality  
Permitting and Compliance Division

Montana Air Quality Permit #2459-15

Stillwater Mining Company – Nye Facility  
2562 Nye Road  
Nye, Montana 59061

January 31, 2012



## MONTANA AIR QUALITY PERMIT

Issued to: Stillwater Mining Company                      MAQP: #2459-15  
2562 Nye Road    Administrative Amendment (AA) Request  
Nye, MT 59061    Received: 12/28/11:  
Department Decision on AA: 1/13/12  
Permit Final: 1/31/12  
AFS: 095-0001

A Montana Air Quality Permit (MAQP) is hereby granted to the Stillwater Mining Company – Nye Facility (Stillwater Mining) pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and the Administrative Rules of Montana (ARM) 17.8.740, *et seq.*, as amended, for the following:

### Section I. Permitted Facilities

#### A. Plant Location

Stillwater Mining operates an underground platinum/palladium mine, ore processing plant, and tailings disposal at the Nye facility. The facility is located approximately 6 miles south of Nye. The legal description of the mine site is Sections 1, 2, 10, 11, 15, 16, 21, and 23, Township 5 South, Range 15 East, in Stillwater County, Montana.

#### B. Current Permit Action

On January 13, 2012, the Montana Department of Environmental Quality – Air Resources Management Bureau (Department) issued the final version of MAQP #2459-14 to Stillwater Mining. Stillwater Mining submitted comments on the draft version of MAQP #2459-14 which were received by the Department within the designated public comment period; however, these comments were not addressed in the Department’s Decision on the draft permit or in the final permit because the comments were not properly relayed to the permit writer. The Department is obligated to address the permittee’s comments; therefore, the Department is issuing this AA to respond to Stillwater Mining’s comments on the preliminary draft of MAQP #2459-14 and make appropriate changes to any permit conditions to reflect those comments. The submitted comments and the Department’s responses can be found in the Permit Analysis. Included with the submitted comments was a de minimis determination request for the addition of a 2 million British thermal unit per hour (MMBtu/hr) propane-fired space heater. The Department has determined that this unit meets the criteria of a de minimis change. The current permitting action updates the facility’s potential propane combustion capacity which includes the proposed 2 MMBtu/hr propane-fired space heater; corrects the potential emissions from the concrete batch plant; adds applicability statements for 40 Code of Federal Regulations (CFR) 60, Subpart III and 40 CFR 63, Subpart ZZZZ; creates an annual hourly limit with recordkeeping and reporting requirements for the Shaft Emergency Diesel Generator Engine; updates the facility’s potential gasoline combustion capacity; and includes a new and complete version of the facility-wide emission inventory.

## Section II. Permit Terms

### A. Limitations and Conditions

1. Metallic mineral process fugitive emissions are subject to an opacity limitation of 10% (ARM 17.8.340 and 40 CFR 60, Subpart LL).
2. If the Department determines it to be necessary, Stillwater Mining shall install a sprinkler system or provide equivalent mitigative measures to control wind-blown emissions from the tailings facilities. The Department shall determine the necessity of the above control measures based on personal observation, complaints, or any combination of the above (ARM 17.8.752).
3. Stillwater Mining shall utilize a dust suppression program on all dirt roads. The necessity for additional measures on other portions of the road or the entire road will be determined by the Department through on-site inspections, complaints, or any combination of the above (ARM 17.8.749).
4. Mine production and milling rates shall not exceed 1,825,000 tons during any rolling 12-month time period or 5,000 tons per day (ARM 17.8.749).
5. Compliance with emission and opacity standards and testing requirements shall be as specified in 40 CFR Part 60, where applicable (ARM 17.8.749).
6. If the Department determines it to be necessary, Stillwater Mining shall provide mitigative measures to control wind-blown emissions from the east-side waste rock disposal area. The Department shall determine the necessity of the control measures above on the basis of personal observation, complaints, or any combination of the above (ARM 17.8.752).
7. Stillwater Mining shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements as required by 40 CFR 60, Subpart LL, Standards of Performance for Metallic Mineral Processing (ARM 17.8.340 and 40 CFR Part 60, Subpart LL).
8. Stillwater Mining shall not cause or authorize to be discharged into the atmosphere from any surface crushing operation, and associated material handling systems, any stack emissions that (ARM 17.8.340 and 17.8.752):
  - a. Contain particulate matter in excess of 0.05 grams per dry standard cubic meter (g/dscm) or 0.022 grains per dry standard cubic foot (gr/dscf); and
  - b. Exhibit greater than 7% opacity.
9. Stillwater Mining 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 and ARM 17.8.749).
10. Stillwater Mining shall treat all unpaved portions of the haul roads, access roads, and the general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.9 (ARM 17.8.749).

11. The Paste Plant Emergency Flush Pump Diesel Engine shall be used for emergency or back-up operations only and shall be limited to 500 hours of operation during any rolling 12-month time period (ARM 17.8.749).
12. The Shaft Emergency Diesel Generator shall be used for emergency or back-up operations only and shall be limited to 500 hours of operation during any rolling 12-month time period (ARM 17.8.749).
13. The surface Nordberg cone crusher shall utilize a fabric filter baghouse to control particulate emissions (ARM 17.8.749).
14. The cement silo associated with the cement batch plant operation shall be enclosed with fabric filtration to control particulate emissions in the exhaust air (ARM 17.8.749).
15. Stillwater Mining shall not cause or authorize to be discharged into the atmosphere, from any sources associated with the concrete batch plant operation, any visible emissions that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.308 and ARM 17.8.752).
16. Water and/or chemical dust suppressant shall be available on site and used, as necessary, to maintain compliance with the opacity limitations in Section II.A.3 and Section II.A.15 (ARM 17.8.752).
17. The propane-fired portal heater at the 5000 East Portal shall have a maximum heat input capacity design rating not to exceed 28 MMBtu/hr (ARM 17.8.749).
18. The propane-fired portal heater at the 5000 East Portal shall be properly operated and maintained in a manner that satisfies the manufacturer's terms for the guarantee of pollutant emission rates (ARM 17.8.752).
19. The total propane combustion capacity at the facility shall not exceed 149 MMBtu/hr (ARM 17.8.749).
20. Stillwater Mining shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements contained in 40 CFR 60, Subpart III, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines* and 40 CFR 63, Subpart ZZZZ, *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, for any applicable diesel engine (ARM 17.8.340; 40 CFR 60, Subpart III; ARM 17.8.342 and 40 CFR 63, Subpart ZZZZ).

B. Testing Requirements

1. Within 60 days after achieving the maximum production rate, but not later than 180 days after initial start up, a United States Environmental Protection Agency (USEPA) Method(s) 1-5 and Method 9 opacity source test must be performed on any 40 CFR 60, Subpart LL, affected equipment at the facility, as appropriate. After the initial source test, additional source testing shall be conducted as required by the Department or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105; ARM 17.8.340; 40 CFR Part 60, General Provisions; and 40 CFR Part 60, Subpart LL).

2. All compliance source tests must be conducted in accordance with the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).
3. The Department may require further testing (ARM 17.8.105).

C. Operational Reporting Requirement

1. Stillwater Mining 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 (ARM 17.8.749).

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). Stillwater Mining 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. The amount of ore and waste handled;
  - b. A description of any dust suppression program. With respect to the dust suppression program, the information shall include the areas of application, frequency of application, and amount;
  - c. Fuel consumption;
  - d. The total hours of operation for the Paste Plant Emergency Flush Pump Diesel Engine for the previous year;
  - e. The total hours of operation for the Shaft Emergency Diesel Generator Engine for the previous year;
  - f. A summary report listing the reasons for operation of the Paste Plant Emergency Flush Pump for each time the emergency diesel engine was in operation;
  - g. A summary report listing the reasons for operation of the Shaft Emergency Diesel Generator Engine for each time the emergency diesel engine was in operation; and
  - h. Any other related information the Department may request.
2. Stillwater Mining shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745 that would include ***the addition of new emissions unit***, change in the 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 or the addition of a new emission unit. 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(1)(d) (ARM 17.8.745).

3. Stillwater Mining shall document, by month, the total ore production at the facility. By the 25<sup>th</sup> day of each month, Stillwater Mining shall total ore production during the previous 12-months to verify compliance with the limitation in Section II.A.4. A written report of the compliance verification shall be submitted along with the annual emissions inventory (ARM 17.8.749).
4. Stillwater Mining shall document, by month, the total hours of operation of the Paste Plant Emergency Flush Pump Diesel Engine. By the 25<sup>th</sup> day of each month, Stillwater Mining shall total the hours of operation of the Paste Plant Emergency Flush Pump Diesel Engine during the previous 12 months to verify compliance with the limitation in Section II.A.11. A written report of the compliance verification shall be submitted along with the annual emissions inventory (ARM 17.8.749).
5. Stillwater Mining shall document, by month, the total hours of operation of the Shaft Emergency Diesel Generator Engine. By the 25<sup>th</sup> day of each month, Stillwater Mining shall total the hours of operation of the Shaft Emergency Diesel Generator Engine during the previous 12 months to verify compliance with the limitation in Section II.A.12. A written report of the compliance verification shall be submitted along with the annual emissions inventory (ARM 17.8.749).

D. Notification

1. Stillwater Mining shall provide the Department with written notification of the following dates within the specified time periods as required for 40 CFR Part 60, Subpart LL, affected facilities (ARM 17.8.340 and 40 CFR 60, Subpart LL):
  - a. Commencement of construction within 30 days after commencement of construction;
  - b. Anticipated start-up date between 30 and 60 days prior to anticipated start-up date; and
  - c. Actual start-up date within 15 days after the actual start-up date.
2. Stillwater Mining shall provide the Department with written notification of the following dates within the specified time periods for the 28 MMBtu/hr propane-fired portal heater (ARM 17.8.749):
  - a. Commencement of construction within 30 days after commencement of construction;
  - b. Anticipated start-up date between 30 and 60 days prior to anticipated start-up date; and
  - c. Actual start-up date within 15 days after the actual start-up date.

Section III. General Conditions

- A. Inspection – Stillwater Mining 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 such as continuous emission

monitoring systems (CEMS) and 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 all the terms, conditions, and matters stated herein shall be deemed accepted if Stillwater Mining fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Stillwater Mining 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 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 Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by Stillwater Mining may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Construction Commencement – Construction 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  
 Stillwater Mining Company – Nye Facility (Stillwater Mining)  
 MAQP #2459-15

I. Introduction/Process Description

A. Permitted Equipment

Emitting Unit ID	Name
EU001	Mine Ventilation Exhaust
EU002	Crushing Ore (Surface)
EU003	Load & Dump: Coarse Ore into Crusher Hopper
EU004	Load & Dump: Coarse Ore into Mill Hopper
EU005	Conveying System Transfer Points
EU006	Load & Dump Waste Rock onto Tailings Embankment/Storage
EU007	Disturbed Areas
EU008	Haul Roads
EU009	Diesel Use
EU010	Unleaded Gasoline Use (65,000 gallons per year (gal/yr))
EU011	Paste Plant Emergency Flush Pump Emergency Diesel Engine (225 horsepower (hp))
EU012	Concrete Batch Plant Operations
EU015	Soda Ash Silo
EU016	Propane Combustion from Portal Heaters, Space Heaters, and Line Heaters (149 million British thermal units per hour (MMBtu/hr))
EU017	Shaft Emergency Diesel Generator Engine (947 hp)
IEU01	Grinding Mills (wet process)
IEU02	Cycloning (wet process)
IEU03	Flotation Circuit (wet process)
IEU04	Thickener (wet process)
IEU05	Vacuum filter (wet process)
IEU06	Paste Plant Operations
IEU07	Open Burning
IEU08	Above Ground Fuel Storage

B. Source Description

The Stillwater Mine is located in Stillwater County near Nye, Montana. The legal description of the mine site is Sections 1, 2, 10, 11, 15, 16, 21, and 23, Township 5 South, Range 15 East, Stillwater County, Montana. The facility is an underground platinum/palladium (platinum group metals) mine. The operation includes ore and waste excavation, surface and underground crushing, conveying, grinding, flotation concentration, tailings disposal, a concrete batch operation, and a paste plant operation. The concentrate extracted from the Nye mine is trucked to the Stillwater Mining Company Metallurgical Complex (smelter and refinery) for further refining and processing.

C. Permit History

(NOTE: Administrative Rules of Montana (ARM) references in this Permit History section reflect the rule numbers as they existed at the time of that permit action.)

**Permit #2459** was issued for the Stillwater Mine on March 29, 1988, to Stillwater Mining. The permit was based on 1000 tons per day (TPD) of ore production.

**Permit #2459A** was an alteration issued October 21, 1988, to extend mining to the east side of the Stillwater River with no increase in ore production, but a slight increase in particulate emissions.

**Permit #2459A-2** was issued March 11, 1991, to clarify language relative to the annual production limitation.

**Permit #2459-03** was issued August 14, 1992, to increase the ore production rate from 1000 to 3500 TPD and from 365,000 to 730,000 tons per year (TPY).

**Permit #2459-04** was a modification issued on April 27, 1993.

**Permit #2459-05** was a modification to clarify the performance testing requirement on the wet scrubber controlling emissions from the concentrate dryer. The permit was also updated to include a more specific listing of applicable regulations.

**Permit #2459-06** was an alteration issued October 18, 1995, to replace the concentrate dryer wet scrubber with a fabric filter collector (baghouse). Notification and testing requirements, relative to the baghouse, were also added.

**Permit #2549-07** was a modification issued on April 17, 1997, to add crushing, screening, and hauling of bedding material to the emission inventory in the permit analysis. It had been inadvertently taken out of the emission inventory in a previous permitting action. Permit number citations in the permit and analysis were also updated.

**Permit #2459-08** was issued on October 25, 1998. Stillwater Mining requested a production limit increase from 730,000 TPY or 3,500 TPD to 1,825,000 TPY or 5,000 TPD. The increased activity at the mine resulted in an increase in Particulate Matter with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>) emissions of approximately 48 TPY. A New Source Review/Prevention of Significant Deterioration (PSD) review was not required for the proposed production increase because the facility is not a listed source and the facility's potential to emit (excluding fugitive emissions) does not exceed 250 TPY of any pollutant.

In addition, Stillwater Mining planned to construct and operate a new tailings impoundment located approximately 7 miles northeast of the mine site (2 miles northeast of Nye), install a pipeline system along Stillwater County Road 420 and reclaim the resulting surface disturbance, and expand the waste rock storage area located on the east side of the Stillwater River at the mine site.

Further, the language in Section II.A.1 was revised to remove the language requiring dryer emission testing every 4 years. Testing was required when the dryer's process rate increased above the process rate that the dryer was functioning at during the last performance test. For example, if the dryer process rate increased above the level it was operating at during the particulate test performed on October 21, 1996, an emissions test would be required. Also, the Department of Environmental Quality (Department) removed the requirement for Stillwater Mining to move the downwind PM<sub>10</sub> sampler within 90 days after Permit #2459-08 was final. The permit did specify that Stillwater Mining would move the sampling site to a different location, approved by the Department, at such time as the east-side waste rock storage encroached on the current location. Stillwater Mining was required to request the Department's approval of the new downwind PM<sub>10</sub> sampler at least 90 days prior to moving to a new site.

Finally, the Department added crushing, screening, and hauling of bedding material to the emission inventory in the Permit Analysis. This activity was listed in Permit #2459-07. Controlled emissions from this activity were 2.32 tons per year. **Permit #2459-08** replaced Permit #2459-07.

Stillwater Mining submitted an application on January 20, 2000, for the alteration of Permit #2459-08. The alteration included the installation and operation of a new surface jaw crusher and conveying system. The new system was determined to be subject to 40 Code of Federal Regulations (CFR), Subpart LL, New Source Performance Standards for Metallic Mineral Processing. **Permit #2549-09** replaced Permit #2459-08.

On April 11, 2001, the Department received a letter from Stillwater Mining requesting a need for permit determination for the addition of an emergency generator at the Hertzler Pump Station, a Nordberg cone crusher (maximum capacity 70 tons per hour (tph)), and associated material handling equipment. Because the potential uncontrolled emissions from the proposed changes did not exceed the de minimis threshold of 15 TPY, the permit action was accomplished under the ARM 17.8.705(1)(r). The crushing system was determined to be subject to 40 CFR 60, Subpart LL, New Source Performance Standards for Metallic Mineral Processing. **Permit #2459-10** was issued to update the permit with the new equipment and replaced Permit #2459-09.

On December 27, 2001, Stillwater Mining submitted a complete permit application for the alteration of air quality Preconstruction Permit #2459-10. The alteration involved the addition of an existing but not-permitted cement batch plant including conveyors and material silos and the modification of the existing Nordberg cone crusher. Further, the permit action incorporated an existing, but not-permitted, paste plant and associated cement silo in accordance with ARM 17.8.705(1)(r).

The above cited cement batch and paste plant operations were added to the facility as separate and distinct projects in the past but were not permitted at the time of construction. Potential emissions from the paste plant operation were less than the de minimis threshold of 15 TPY so the plant was added to the permit under ARM 17.8.705(1)(r).

On October 11, 2001, Stillwater Mining submitted information requesting a de minimis determination for the cement batch plant operation. Based on the information submitted, the Department determined that the concrete batch plant operations did not meet the definition of a de minimis source of emissions as defined in the ARM 17.8.705(1)(r).

Emission inventory calculations submitted by Stillwater Mining indicated that the cement batch plant potential to emit (PTE) is less than the de minimis threshold of 15 TPY. However, the calculations submitted to the Department included control credit for several emission points within the cement batch system. Control credit cannot be used when determining a source's PTE for a de minimis determination. Without control credit applied, the concrete batch operations exceed the de minimis threshold; therefore, a permit alteration was required.

Further, as part of the current permit action Stillwater Mining proposed to modify the existing Nordberg cone crusher, permitted under Permit #2459-10, to increase the crusher production capacity from 70 tph to 150 tph. Potential uncontrolled emissions from the Nordberg crushing operation and associated equipment exceed the de minimis threshold and, therefore, modifying the crusher to increase capacity required a permit alteration. The Nordberg cone crusher and all associated material transfer points are subject to the requirements of 40 CFR Part 60, Subpart LL, Metallic Mineral Processing Plants. Total potential controlled and uncontrolled emissions for the permit action were included in the emission inventory, Section IV.

Finally, in accordance with Permit #2459-10, as of October 1, 2001, the downwind PM<sub>10</sub> air sampler was relocated to the Stillwater Valley Ranch (Stillwater North). Attachment 1, Ambient Air Monitoring Plan – Stillwater Mining Company, to air quality Permit #2459-11 incorporated the changed downwind PM<sub>10</sub> monitoring location as well as the changes previously identified. **Permit #2459-11** replaced Permit #2459-10.

On March 19, 2002, the Department received a letter from Stillwater Mining requesting a modification to air quality Permit #2459-11. The modification included removing the Hertzler Pump Station emergency diesel generator from the list of permitted equipment and adding an emergency diesel generator (Paste Plant Emergency Flush Pump) to the Paste Plant facility. Stillwater Mining developed an alternative method of clearing the Hertzler tailings pipeline during power outages. The alternative method uses a combination of high pressure water and pigging of the line. Because Stillwater developed the previously described new method of clearing the Hertzler tailings pipeline the Hertzler Pump Station emergency diesel generator was no longer required.

The Paste Plant Emergency Flush Pump is used only during power outages to flush the paste line to avoid plugging. Because potential uncontrolled emissions from the proposed Paste Plant Emergency Flush Pump, operating under the emergency generator requirements in Section II.A.13 of the permit, did not exceed the de minimis threshold of 15 TPY, the permit action was completed in accordance with ARM 17.8.705(1)(r). **Permit #2459-12** replaced Permit #2459-11.

On May 1, 2002, the Department received a permit application for proposed changes at the Stillwater Mining facility. The proposed changes included the addition of two 1500 cubic feet per minute (cfm) 400 kilowatt (kW) diesel air compressor engines (compressors #1 and #2) and the removal of emergency/back-up status requirements for the existing 2000 kW Caterpillar diesel powered electric generator (shaft generator). After initial review, the Department determined that the application was incomplete for lack of equipment specific information and nitrogen oxides (NO<sub>x</sub>) air dispersion modeling. Stillwater Mining was sent a letter of incompleteness indicating the previously cited application deficiencies. On September 3, 2002, the Department received the requested incomplete information from Stillwater Mining. However, after review of the information submitted, the Department again determined that the application was incomplete and sent Stillwater Mining a letter indicating application deficiencies. Subsequently, on November 15, 2002, the Department received a letter from Stillwater Mining including the requested incomplete information and withdrawing the request to remove emergency/back-up status for the shaft generator. The application for the addition of compressors #1 and #2 was deemed complete on November 15, 2002.

Further, on May 21, 2002, the Department received a request from Stillwater Mining to relax or discontinue ambient air monitoring requirements for their facility. When determining if permitted ambient monitoring requirements can be relaxed or discontinued the Department uses the Department Monitoring Requirements Guidance Statement established October 9, 1998. The guidance statement provides an ambient air monitoring decision matrix to be used for determining the need for ambient monitoring.

Since 1988, Stillwater Mining had operated ambient air samplers on a once-every-6-day schedule from November through April and on a once-every-3-day schedule from May through October. Based on actual sampling data from the period of 1997 through 2000 and using the Department's ambient air monitoring decision matrix, the Department determined, with a high level of confidence, that discontinuation of ambient monitoring was appropriate for the Stillwater Mining facility. As stated in a letter to Stillwater Mining dated June 10, 2002, effective at the end of June 2002, Stillwater Mining is no

longer subject to ambient air monitoring requirements. Under this permit action, Attachment 1, Ambient Air Monitoring Plan, was removed. Finally, the Department updated various sections of the permit to reflect current permit language and requirements. **Permit #2459-13** replaced Permit #2459-12.

On November 4, 2011, the Department received an MAQP modification application from Bison Engineering, Incorporated (Bison) on behalf of Stillwater Mining to install a new 28 MMBtu/hr propane-fired portal heater at the 5000 East Portal to provide additional warm air to the underground mining operations during the winter months. In addition, Stillwater Mining proposed to increase the underground ventilation capacity to 2,000,000 cubic feet per minute (cfm) to meet Mine Safety and Health Administration (MSHA) standards as the total underground area expands. A propane-fired concentrate dryer has been decommissioned and replaced with a hydraulic system that does not generate air emissions; therefore, Stillwater Mining requested that this dryer be removed from the MAQP.

On November 30, 2011, the Department received an email correspondence from Stillwater Mining with an updated list of permitted equipment. The updated list indicated that the two 400 kW diesel compressor engines that were permitted in MAQP #2459-13 were never installed and could be removed from the list of permitted equipment. This correspondence also indicated that Stillwater Mining would prefer for all of the propane-fired portal and space heaters to be grouped together as a single emitting unit referred to as Propane Usage rather than listing each unit individually. This Propane Usage unit would include the new 28 MMBtu/hr portal heater.

The Department incorporated into the MAQP any new emitting units that were approved in accordance with the ARM 17.8.745 de minimis rule that had occurred since the issuance of MAQP #2459-13. These actions are listed below.

- On October 14, 2003, the Department approved the addition of two 2.5 MMBtu/hr propane-fired heated make-up air units for providing air exchange within the mill building.
- On January 2, 2004, the Department approved the addition of a 1.0 MMBtu/hr natural gas-fired heated make-up air unit and 50 cubic yard per day (cy/day) concrete batch plant. A November 30, 2011 email correspondence from Stillwater Mining stated that the natural gas-fired heater does not exist at the facility; therefore, it was not included as a permitted emitting unit. The 50 cy/day concrete batch plant was added to the MAQP.
- Stillwater Mining notified the Department via correspondence dated January 27, 2004 of the installation of a 1.65 MMBtu/hr propane-fired heated make-up air unit to provide air exchange within the emissions testing bay. The correspondence demonstrated that this action was in accordance with de minimis requirements.
- On August 5, 2004, the Department approved the addition of two 0.120 MMBtu/hr propane-fired heaters for use in the administrative building and the installation of a 50-ton capacity soda ash silo.
- Stillwater Mining requested a de minimis determination in a May 1, 2006 letter for the temporary use of a 1.5 megawatt (MW) diesel generator. Stillwater Mining confirmed in a November 11, 2011 email that this unit was only required

for temporary use and is not currently located on site; therefore, it was not included as a permitted emitting unit.

- On May 2, 2008, the Department approved the temporary use of three 400-kW diesel generators. Stillwater Mining confirmed in a November 11, 2011 email that these units were only required for temporary use and are not currently located on site; therefore, they were not included as permitted emitting units.
- On June 22, 2011, the Department approved the temporary use of three 689 hp diesel generator engines. Stillwater Mining confirmed in a November 11, 2011 email that these units were only required for temporary use and are not currently located on site; therefore, they were not included as permitted emitting units.

This permit action added the new portal heater, removed the concentrate dryer, incorporated the de minimis actions that have been approved since the previous permit issuance, updated the emission inventory to reflect the new equipment and ventilation capacity, and updated permit language and rule references to current Department practices. **MAQP #2459-14** replaced MAQP #2459-13.

D. Current Permit Action

On January 13, 2012, the Montana Department of Environmental Quality – Air Resources Management Bureau (Department) issued the final version of MAQP #2459-14 to Stillwater Mining. Stillwater Mining submitted comments on the draft version of MAQP #2459-14 which were received by the Department within the designated public comment period; however, these comments were not addressed in the Department’s Decision on the draft permit, or in the final permit, because the submitted comments were not properly relayed to the permit writer. The submitted comments and the Department’s responses are shown in the following table:

Person/Group Commenting	Permit Reference	Comment	Department Response
Stillwater Mining	Permit Analysis – Permitted Equipment & Emission Inventory	<p><b>Comment #1: The total rated propane combustion capacity at the Nye facility would be 148.9 mmbtu/hr pending this permit modification.</b></p> <p>The emission inventory in the PD for MAQP #2459-14 included the addition of the proposed 28 mmbtu/hr heater at the 5000E Portal and the de minimis additions of several small propane combustion units since the issuance of permit #2459-13. The total rated heat capacity of propane fired equipment, pending this permit modification, would be 148.9 mmbtu/hr. This capacity includes the proposed 28 mmbtu/hr portal heater at the 5000E portal, the addition of a new 2 mmbtu/hr space heater at a mobile equipment maintenance shop planned in 2012, and all existing propane fired heaters, boilers, and other combustion units since the Nye facility began operation in 1988. Because the list of all of the propane-fired portal heaters,</p>	The Department has made the requested change.

Person/Group Commenting	Permit Reference	Comment	Department Response
		<p>boilers, space heaters, and line heaters at the Nye facility is very long, we propose that all of these units be captured in a single emitting unit, designated as EU016 Propane Combustion in MAQP #2459-14. We propose that the maximum heat input capacity of EU016 be limited to 149 mmbtu/hr.</p> <p>Bison has developed an emission inventory for EU016, as well as all other emitting units, at the Nye facility. The facility-wide emission inventory is attached to this letter (Attachment 1) for the Department's review. A de minimis notification for the planned 2 mmbtu/hr space heater at the mobile equipment maintenance shop is included as Attachment 2.</p>	
Stillwater Mining	Permit Analysis – Permitted Equipment & Emission Inventory	<p><b>Comment#2: The emission inventory for the Cement Batch Plant should be revised.</b></p> <p>SMC and Bison have reviewed the emission inventory for the Cement Batch Plant Operations (page 15 of the Permit Analysis) and the 50 yard/day concrete batch plant (page 16 of the Permit Analysis). SMC and Bison believe the emission inventory should be revised because the cement batch plant operations are accounted for in the 50 yard/day concrete batch plant operations.</p> <p>A facility wide emission inventory, which includes the 50 yard/day concrete batch plant (designated EU012 in MAQP #2459-14), is included as Attachment 1 to this letter for the Department's review. The emissions from EU012 are divided into two parts in the attached emission inventory: EU012a and EU012b. EU012a includes uncontrolled particulate emissions from material transfer points (aggregate transfers, sand transfers, and weigh hopper loading). EU012b includes emissions from cement unloading to the elevated storage silo and emissions from truck loading, which are controlled by a bag house. A diagram noting the controlled and uncontrolled emissions is included as Attachment 3 to this letter.</p> <p>To eliminate confusion in the future, we propose that EU012 be re-named "Concrete Batch Plant Operations."</p>	The Department has updated the facility emissions to reflect that the 50 yard per day cement batch plant replaced the previous concrete batch plant. This unit is now referred to as the Concrete Batch Plant Operations.

Person/Group Commenting	Permit Reference	Comment	Department Response
Stillwater Mining	Section II.A & Permit Analysis Section II.C.8.c	<p><b>Comment #3: The reciprocating internal combustion engines at the Nye facility are Emergency Stationary Reciprocating Engines Subject to 40 CFR 63, Subpart ZZZZ National Emission Standards Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE).</b></p> <p>The Department determined that the Paste Plant Flush Pump Emergency Diesel Engine (EU011) and the Shaft Emergency Diesel Generator Engine (EU017) were existing commercial emergency stationary RICE located at an area source of HAP emissions, and do not have to meet the requirements of 40 CFR Part 63 Subpart ZZZZ. We disagree with this determination, because EU011 and EU017 do not meet the definition of commercial stationary RICE per 40 CFR Part 63 Subpart ZZZZ §63.6675:</p> <p><i>Commercial emergency stationary RICE means an emergency stationary RICE used in commercial establishments such as office buildings, hotels, stores, telecommunications facilities, restaurants, financial institutions such as banks, doctor's offices, and sports and performing arts facilities (40 CFR Part 63, Subpart ZZZZ §63.6675).</i></p> <p>Instead, the definition of emergency stationary RICE seems applicable to EU011 and EU017:</p> <p>Emergency stationary RICE means any stationary internal combustion engine whose operation is limited to emergency situations and required testing and maintenance. Examples include stationary RICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary RICE used to pump water in the case of fire or flood, etc. Stationary RICE used for peak shaving are not considered emergency stationary RICE. Stationary RICE used to supply power to an electric grid or that supply non-emergency power as part of a financial arrangement with another entity are not considered to be</p>	<p>The Department has made the requested change. It is Department practice to include references to 40 CFR 60, Subpart IIII – <i>Standards of Performance for Stationary Compression Ignition Engines</i> when mentioning applicability of 40 CFR 63, Subpart ZZZZ – <i>National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines</i> because these two regulations are closely related and typically share some applicability criteria. This does not imply that the Department considers the referenced engine to be subject to 40 CFR 60, Subpart IIII at this time, but that it may become applicable in the future if Stillwater makes changes to the engine.</p>

Person/Group Commenting	Permit Reference	Comment	Department Response
		<p>emergency engines, except as permitted under §63.6640(f). All emergency stationary RICE must comply with the requirements specified in §63.6640(f) in order to be considered emergency stationary RICE. If the engine does not comply with the requirements specified in §63.6640(f), then it is not considered to be an emergency stationary RICE under this subpart. 1</p> <p>Based on our interpretation of Subpart ZZZZ, EU011 and EU017 are subject to limited maintenance, record keeping, and other requirements. A complete list of the requirements for these engines is included as Attachment 4 to this letter for the Department's review. SMC will meet the applicable requirements of this rule by the specified deadline of May 3, 2013.</p>	
Stillwater Mining	Section I.B, II.A, and II.C	<p><b>Comment #4: The PD of MAQP #2459-14 does not include an hours of operation limitation or record keeping requirements for the Shaft Emergency Diesel Generator Engine (EU017).</b></p> <p>Page 1 of the PD for MAQP 2459-14 states:</p> <p>The current permit action incorporates the new portal heater, removes the concentrate dryer and two 400 kW diesel compressor engines, <b>establishes recordkeeping conditions for the shaft emergency generator</b>, incorporates the de minimis actions that have been approved since the previous permit issuance, updates the emission inventory to reflect the new equipment and ventilation capacity, and updates permit language and rule references to current Department practices (emphasis added).</p> <p>Bison and SMC note that the draft permit includes an hours of operation limitation and recordkeeping requirements for the Paste Plant Emergency Flush Pump Diesel Engine (EU011). However, these requirements are not identified for EU017. We believe this to be a simple oversight by the Department and wish to draw this to your attention to ensure that we have an accurate permit with applicable hours of operation limitations (500 hours) and recordkeeping requirements as permit conditions for EU017.</p>	The Department concurs with Stillwater Mining's conclusion that the permit would be more accurate if it contained similar operational and recordkeeping requirements for both emergency engines. Therefore, based on this written request from Stillwater Mining, the Shaft Emergency Diesel Generator Engine will have operational limits on hours of operation and recordkeeping requirements.

Person/Group Commenting	Permit Reference	Comment	Department Response
Stillwater Mining	Permit Analysis – Emission Inventory	<p><b>Comment #4 (sic): The Unleaded Gasoline Usage (EU010) should be updated from 51,568 gal/yr to 65,000 gal/yr.</b></p> <p>During the previous Title V Operating Permit Renewal (OP2459-04) in 2005, Bison and SMC updated the emission inventory to increase unleaded gasoline usage from 51,568 gal/year to 65,000 gallons/year. This increase has not been accounted for in SMCs Montana Air Quality Permit. We would like to correct MAQP 2459-14 to note this increase in unleaded gasoline usage. The emissions from EU010 are included as Attachment 1 to this letter for the Department's review.</p>	The Department has made the requested change.

The Department is obligated to address the permittee's comments; therefore, the Department is issuing this AA to address Stillwater Mining's comments on the preliminary draft of MAQP #2459-14 and make appropriate changes to any permit conditions to reflect those comments. Included with the submitted comments was a de minimis determination request for the addition of a 2 MMBtu/hr propane-fired space heater. The Department has determined that his unit meets the criteria of a de minimis change. The current permitting action updates the facility's potential propane combustion capacity which includes the proposed 2 MMBtu/hr propane-fired space heater; corrects the potential emissions from the concrete batch plant; adds applicability statements for 40 CFR 60, Subpart IIII and 40 CFR 63, Subpart ZZZZ; creates an annual hourly limit with recordkeeping and reporting requirements for the Shaft Emergency Diesel Generator Engine; updates the facility's potential gasoline combustion capacity; and includes a new and complete version of the facility-wide emission inventory. **MAQP #2459-15** replaces MAQP #2459-14.

E. 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 explanations of some applicable rules and regulations that apply to the operation. The complete rules are stated in the 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 is 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 Montana Clean Air Act, 75-2-101, *et seq.*, Montana Code Annotated (MCA).  
  
Stillwater Mining 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. 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 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 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
10. ARM 17.8.223 Ambient Air Quality Standard for PM<sub>10</sub>

Stillwater Mining must comply 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. This rule requires that no person shall cause or authorize the production, handling, transportation, or storage of any material unless reasonable precautions to control emission of airborne particulate matter are taken. Such emissions of airborne particulate matter from any stationary source shall not exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.
  3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, suffer, allow or permit particulate matter caused by the combustion of fuel in excess of the amount determined by this section.
  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 set forth in this section.
  5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. Commencing July 1, 1972, no person shall burn liquid or solid fuels containing sulfur in excess of 1 pound of sulfur per million Btu fired. Commencing July 1, 1971, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions.
  6. ARM 17.8.340 Standard of Performance for New Stationary Sources. The owner and operator of any stationary source or modification, as defined and applied in 40 CFR Part 60, shall comply with the standards and provisions of 40 CFR Part 60. Stillwater Mining is considered a new source performance standards (NSPS)-affected facility under 40 CFR 60 and is subject to the requirements of the following subpart:
    - 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 - requires an opacity limitation of 10% for metallic mineral process fugitive emissions, a stack emission limitation of 0.05 grams per dry standard cubic meter (0.022 grains per dry standard cubic foot), and a stack opacity limitation of 7%. The surface mining operations at Stillwater Mining are subject to 40 CFR 60, Subpart LL.
    - 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 Stillwater Mining, the CI ICE equipment to be used under MAQP #2459-15 are not currently subject to this subpart because they commenced construction prior to the applicability dates. However, future engine installations, modifications, or replacements may be subject to this subpart.

7. 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.
  8. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants (HAP) for Source Categories. The source, as defined and applied in 40 CFR Part 63, shall comply with the requirements of 40 CFR Part 63, as listed below:
    - a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to an NESHAP Subpart as listed below:
    - b. 40 CFR 63, Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters. The proposed portal heater does not meet the definition of a process heater per this subpart, nor is the facility a major source of HAP. Therefore, this subpart is not triggered as part of this permit action.
    - c. 40 CFR 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE). Stillwater Mining has two emergency diesel RICE at the Nye facility which are affected sources under this subpart.
- 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. A permit fee is not required for the current permit action because it is considered an administrative permit change.
  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 pro-rate 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 PTE greater than 25 TPY of any pollutant. Stillwater Mining has the PTE greater than 25 TPY of particulate matter (PM), PM with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>), PM with an aerodynamic diameter of 2.5 microns or less (PM<sub>2.5</sub>), NO<sub>x</sub>, carbon monoxide (CO), and volatile organic compounds (VOC); therefore, a 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. Stillwater 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. An affidavit of publication of public notice was not required for the current permit action because the permit change is considered an administrative permit change.
  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 Stillwater 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(1) 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 Stillwater Mining facility is not a major stationary source because it is not listed and it does not have the potential to emit more than 250 tons per year (excluding fugitive emissions) of any pollutant.

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

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any stationary source having:
  - a. PTE > 100 TPY of any pollutant.
  - b. PTE > 10 TPY of any one Hazardous Air Pollutant (HAP), or PTE > 25 TPY of a combination of all HAPs, or a lesser quantity as the Department may establish by rule.
  - c. Sources with PTE > 70 TPY of PM<sub>10</sub> in a serious PM<sub>10</sub> nonattainment area.
2. ARM 17.8.1204 Air Quality Operating Permit Program Applicability. 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 #2459-14 for Stillwater, the following conclusions were made.
  - a. The facility's PTE is greater than 100 TPY for PM<sub>10</sub>.
  - b. The facility's PTE is less than 10 TPY for any one HAP and less than 25 TPY all HAPs.
  - c. This source is not located in a serious PM<sub>10</sub> nonattainment area.
  - d. This facility is subject to a current NSPS – 40 CFR 60, Subpart LL – Standards of Performance for Metallic Mineral Processing Plants.
  - e. This facility is subject to a current NESHAP standard – 40 CFR 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustions Engines.
  - 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 the preceding information, Stillwater Mining is subject to the Title V Operating Permit program. Operating Permit #OP2459-04 was issued final and effective on July 5, 2007. Stillwater Mining has submitted a Title V Renewal application received on December 23, 2011 that is currently under review by the Department.

### III. BACT Determination

A BACT determination is required for each new or modified source. Stillwater 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 determination was not required for the current permit action because the permit change is considered an administrative permit change.

IV. Emission Inventory

Facility Fugitive and Non-Fugitive Sources		TPY						
Unit #	Source	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>
EU001	Mine Ventilation Exhaust	150.17	150.17	22.53	124.40	82.71		4.44
EU002	Crushing Ore (Surface)	18.71	8.40	2.87				
EU003	Load & Dump: Coarse Ore into Crusher Hopper	36.50	14.60	5.48				
EU004	Load & Dump: Coarse Ore into Mill Hopper	36.50	14.60	5.48				
EU005	Conveying System Transfer Points	16.43	6.57	2.46				
EU006	Load & Dump Waste Rock onto Tailings Embankment/Storage	21.90	8.76	3.29				
EU007	Disturbed Areas (from MDEQ Annual EI)	10.41	5.21	0.57				
EU008	Haul Roads	158.89	41.50	4.15				
EU009	Diesel Use	7.86	7.86	7.86	111.77	24.08	9.12	7.35
EU010	Unleaded Gasoline Use (65,000 gallons per year (gal/yr))	0.42	0.42	0.42	6.89	4.18	12.80	0.35
EU011	Paste Plant Emergency Flush Pump Emergency Diesel Engine (225 horsepower (hp))	0.12	0.12	0.12	1.74	0.38	0.14	0.12
EU012	Concrete Batch Plant Operations	0.41	0.32	0.25				
EU015	Soda Ash Silo	0.01	0.01	0.01				
EU016	Propane Combustion from Portal Heaters, Space Heaters, and Line Heaters (149 million British thermal units per hour (MMBtu/hr))	4.99	4.99	4.99	88.09	80.06	5.71	10.70
EU017	Shaft Emergency Diesel Generator Engine (947 hp)	0.17	0.17	0.17	5.68	1.30	0.15	0.10
IEU01	Grinding Mills (wet process)							
IEU02	Cycloning (wet process)							
IEU03	Flotation Circuit (wet process)							
IEU04	Thickener (wet process)							
IEU05	Vacuum filter (wet process)							
IEU06	Paste Plant Operations	1.61	1.03	0.24				
IEU07	Open Burning	0.34	0.34	0.34	UNK	2.80	0.38	UNK
IEU08	Above Ground Fuel Storage						0.62	
<b>TOTALS</b>		<b>465.43</b>	<b>265.06</b>	<b>61.21</b>	<b>338.57</b>	<b>195.51</b>	<b>28.92</b>	<b>23.06</b>

NOTES

Wet Processes are considered to have no measurable emissions

Empty cells are equivalent to zero potential emissions

UNK Unknown

PM Particulate Matter

PM<sub>10</sub> PM with an aerodynamic diameter of 10 microns or less

PM<sub>2.5</sub> PM with an aerodynamic diameter of 2.5 microns or less

NO<sub>x</sub> Nitrogen oxides

CO Carbon monoxide

VOC Volatile organic compounds

SO<sub>2</sub> Sulfur dioxide

Facility Non-Fugitive Sources		TPY						
Unit #	Source	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>
EU001	Mine Ventilation Exhaust	150.17	150.17	22.53	a	a	a	a
EU002	Crushing Ore (Surface)	18.71	8.40	2.87				
EU011	Paste Plant Emergency Flush Pump Emergency Diesel Engine (225 horsepower (hp))	0.12	0.12	0.12	1.74	0.38	0.14	0.12
EU012	Concrete Batch Plant Operations	0.41	0.32	0.25				
EU015	Soda Ash Silo	0.01	0.01	0.01				
EU016	Propane Combustion from Portal Heaters, Space Heaters, and Line Heaters (149 million British thermal units per hour (MMBtu/hr))	4.99	4.99	4.99	88.09	80.06	5.71	10.70
EU017	Shaft Emergency Diesel Generator Engine (947 hp)	0.17	0.17	0.17	5.68	1.30	0.15	0.10
<b>TOTALS</b>		<b>174.58</b>	<b>164.17</b>	<b>30.94</b>	<b>95.51</b>	<b>81.74</b>	<b>6.00</b>	<b>10.91</b>

#### NOTES

Empty cells are equivalent to zero potential emissions

- a Gaseous mine ventilation exhaust emissions result from explosive detonation and mobile diesel sources only and are considered fugitive or non-regulated emissions. All underground stationary point sources are electrically powered.

#### Potential Emissions Calculations

##### **EU001 Mine Ventilation Exhaust**

Maximum Process Rate = 2,000,000 cfm (Application information)

Maximum Hours of Operation = 8,760 hrs/yr

##### **Filterable PM Emissions:**

Emission Factor = 0.002 gr/cf (1999 Title V Permit Application)

Calculation: (0.002 gr/cf) \* (2000000 cfm) \* (1 lb / 7000 gr) \* (60 min/hr) = 34.29 lb/hr

Calculation: (34.29 lb/hr) \* (8760 hrs/yr) \* (0.0005 ton/lb) = 150.17 ton/yr

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

Emission Factor = 0.002 gr/cf (1999 Title V Permit Application)

Calculation: (0.002 gr/cf) \* (2000000 cfm) \* (1 lb / 7000 gr) \* (60 min/hr) = 34.29 lb/hr

Calculation: (34.29 lb/hr) \* (8760 hrs/yr) \* (0.0005 ton/lb) = 150.17 ton/yr

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

Emission Factor = 0.000 gr/cf (PM<sub>2.5</sub> = PM\*15%, AP-42, Appendix B.2, Category 3, 9/90)

Calculation: (0.000 gr/cf) \* (2000000 cfm) \* (1 lb / 7000 gr) \* (60 min/hr) = 5.14 lb/hr

Calculation: (5.14 lb/hr) \* (8760 hrs/yr) \* (0.0005 ton/lb) = 22.53 ton/yr

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

Emission Factor = 1.950 ppm (Stillwater Mining info, July 2010 source testing)

Calculation: (1.95 / 1,000,000) \* (46.0 lb/lb-mol) \* (lb-mol/379 cf) \* (2000000 cfm) \* (60 min/hr) = 28.40 lb/hr

Calculation: (28.40 lb/hr) \* (8760 hrs/yr) \* (0.0005 ton/lb) = 124.40 ton/yr

**CO Emissions**

Emission Factor = 2.130 ppm (Stillwater Mining info, July 2010 source testing)

Calculation:  $(2.13 / 1,000,000) * (28.0 \text{ lb/lb-mol}) * (\text{lb-mol}/379 \text{ cf}) * (34.2857142857143 \text{ lb/hr}) * (60 \text{ min/hr}) = 18.88 \text{ lb/hr}$

Calculation:  $(18.88 \text{ lb/hr}) * (8760 \text{ hrs/yr}) * (0.0005 \text{ ton/lb}) = 82.71 \text{ ton/yr}$

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

Emission Factor = 0.050 ppm (Stillwater Mining info, July 2010 source testing)

Calculation:  $(0.05 / 1,000,000) * (64.1 \text{ lb/lb-mol}) * (\text{lb-mol}/379 \text{ cf}) * (34.2857142857143 \text{ lb/hr}) * (60 \text{ min/hr}) = 1.01 \text{ lb/hr}$

Calculation:  $(1.01 \text{ lb/hr}) * (8760 \text{ hrs/yr}) * (0.0005 \text{ ton/lb}) = 4.44 \text{ ton/yr}$

**EU002a Primary Crushing [jaw crusher] (Surface) (SCC 3-03-024-05)**

Maximum Process Rate = 1,825,000 ton/yr (Application information, max mine production)

Maximum Hours of Operation = 8,760 hrs/yr

**PM Emissions:**

Emission Factor = 0.02 lb/ton (primary crushing - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.02 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) = 18.25 \text{ ton/yr}$

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

Emission Factor = 0.009 lb/ton (primary crushing - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.009 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) = 8.21 \text{ ton/yr}$

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

Emission Factor = 0.003 lb/ton (PM<sub>2.5</sub> = PM \* 15%, AP 42, Appendix B.2, Category 3, 9/90)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.003 \text{ lb/ton}) * (\text{ton}/2000 \text{ lb}) = 2.74 \text{ ton/yr}$

**EU002b Secondary Crushing [cone crusher] (Surface) (SCC 3-03-024-06)**

Maximum Process Rate = 1,825,000 ton/yr (Application information, max mine production)

Maximum Hours of Operation = 8,760 hrs/yr

**PM Emissions:**

Emission Factor = 0.05 lb/ton (secondary crushing - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Control Efficiency = 99% (fabric filter)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.05 \text{ lb/ton}) * (1 - 99/100) * (\text{ton}/2000 \text{ lb}) = 0.46 \text{ ton/yr}$

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

Emission Factor = 0.02 lb/ton (secondary crushing - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Control Efficiency = 99% (fabric filter)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.02 \text{ lb/ton}) * (1 - 99/100) * (\text{ton}/2000 \text{ lb}) = 0.18 \text{ ton/yr}$

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

Emission Factor = 0.015 lb/ton (PM<sub>2.5</sub> = PM \* 30%, AP 42, Appendix B.2, Category 4, 9/90)

Control Efficiency = 99% (fabric filter)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.015 \text{ lb/ton}) * (1 - 99/100) * (\text{ton}/2000 \text{ lb}) = 0.14 \text{ ton/yr}$

**EU003 Load & Dump Coarse Ore/Fine Ore into Crusher Hopper (SCC 3-03-024-08)**

Maximum Process Rate = 1,825,000 ton/yr (Application information, max mine production)

Maximum Hours of Operation = 8,760 hrs/yr

Number of Transfers = 4 transfers

**PM Emissions:**

Emission Factor = 0.01 lb/ton (Material handling & transfer (non-bauxite) - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.01 \text{ lb/ton}) * (4 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 36.50 \text{ ton/yr}$

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

Emission Factor = 0.004 lb/ton (Material handling & transfer (non-bauxite) - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.004 \text{ lb/ton}) * (4 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 14.60 \text{ ton/yr}$

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

Emission Factor = 0.0015 lb/ton (PM<sub>2.5</sub> = PM \* 15%, AP 42, Appendix B.2, Category 3, 9/90)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.0015 \text{ lb/ton}) * (4 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 5.48 \text{ ton/yr}$

**EU004 Load & Dump Fine Ore into Crusher Hopper or Coarse Ore Stockpile (SCC 3-03-024-08)**

Maximum Process Rate = 1,825,000 ton/yr (Application information, max mine production)

Maximum Hours of Operation = 8,760 hrs/yr

Number of Transfers = 4 transfers

**PM Emissions:**

Emission Factor = 0.01 lb/ton (Material handling & transfer (non-bauxite) - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.01 \text{ lb/ton}) * (4 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 36.50 \text{ ton/yr}$

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

Emission Factor = 0.004 lb/ton (Material handling & transfer (non-bauxite) - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.004 \text{ lb/ton}) * (4 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 14.60 \text{ ton/yr}$

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

Emission Factor = 0.0015 lb/ton (PM<sub>2.5</sub> = PM \* 15%, AP 42, Appendix B.2, Category 3, 9/90)

Calculation:  $(1,825,000) * (0.0015 \text{ lb/ton}) * (4 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 5.48 \text{ ton/yr}$

**EU005 Surface Conveying System Transfer Points (SCC 3-03-024-08)**

Maximum Process Rate = 1,825,000 ton/yr (Application information, max mine production)

Maximum Hours of Operation = 8,760 hrs/yr

Number of Transfers = 18 transfers

**PM Emissions:**

Emission Factor = 0.01 lb/ton (Material handling & transfer (non-bauxite) - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Control Efficiency = 90% (enclosure)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.01 \text{ lb/ton}) * (1 - 90/100) * (18 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 16.43 \text{ ton/yr}$

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

Emission Factor = 0.004 lb/ton (Material handling & transfer (non-bauxite) - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Control Efficiency = 90% (enclosure)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.004 \text{ lb/ton}) * (1 - 90/100) * (18 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 6.57 \text{ ton/yr}$

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

Emission Factor = 0.0015 lb/ton (PM<sub>2.5</sub> = PM \* 15%, AP 42, Appendix B.2, Category 3, 9/90)

Control Efficiency = 90% (enclosure)

Calculation:  $(1,825,000 \text{ ton/yr}) * (0.0015 \text{ lb/ton}) * (1 - 90/100) * (18 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 2.46 \text{ ton/yr}$

#### **EU006 Load & Dump Waste Rock onto Tailings Embankment (SCC 3-03-024-08)**

Maximum Process Rate = 1,095,000 ton/yr (Application information, max mine production)

Maximum Hours of Operation = 8,760 hrs/yr

Number of Transfers = 4 transfers

#### **PM Emissions:**

Emission Factor = 0.01 lb/ton (Material handling & transfer (non-bauxite) - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Calculation:  $(1,095,000 \text{ ton/yr}) * (0.01 \text{ lb/ton}) * (4 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 21.90 \text{ ton/yr}$

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

Emission Factor = 0.004 lb/ton (Material handling & transfer (non-bauxite) - high moisture ore, AP 42, Table 11.24.2-2, 8/82)

Calculation:  $(1,095,000 \text{ ton/yr}) * (0.004 \text{ lb/ton}) * (4 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 8.76 \text{ ton/yr}$

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

Emission Factor = 0.0015 lb/ton (PM<sub>2.5</sub> = PM \* 15%, AP 42, Appendix B.2, Category 3, 9/90)

Calculation:  $(1,095,000 \text{ ton/yr}) * (0.0015 \text{ lb/ton}) * (4 \text{ transfers}) * (\text{ton}/2000 \text{ lb}) = 3.29 \text{ ton/yr}$

#### **EU008a Haul Roads - Ore hauled from mine to mill hopper grizzly in front end loader**

Vehicle Miles Traveled (VMT) per Day = 5,819 VMT/yr (Application Info)

VMT per hour =  $(5,819 \text{ VMT/yr}) / (8760 \text{ hrs/yr}) = 0.66 \text{ VMT/hr}$

Hours of Operation = 8,760 hrs/yr

Number of days > 0.01 inches of rain = 120 days/yr (AP-42, Section 13.2.2, Figure 13.2.2-1, 11/06)

#### **PM Emissions:**

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

Emission Factor =  $k * (s / 12)^a * (W / 3)^b = 6.73 \text{ lb/VMT}$

Where: k = constant = 4.9 lbs/VMT (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

W = mean vehicle weight = 25.22 tons (Application Info)

a = constant = 0.7 (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

b = constant = 0.45 (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% =  $(365 - 120) / 365$  (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation:  $(5,819 \text{ VMT/yr}) * (6.73 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) = 13.13 \text{ tons/yr}$  (Uncontrolled Emissions)

Calculation:  $(5,819 \text{ VMT/yr}) * (6.73 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) * (1-50/100) = 6.57 \text{ tons/yr}$  (Apply 50% control efficiency)

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

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

Emission Factor =  $k * (s / 12)^a * (W / 3)^b = 1.71 \text{ lb/VMT}$

Where: k = constant = 1.5 lbs/VMT (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

W = mean vehicle weight = 25.22 tons (Application Info)

a = constant = 0.9 (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

b = constant = 0.45 (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% =  $(365 - 120) / 365$  (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation:  $(5,819 \text{ VMT/yr}) * (1.71 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) = 3.35 \text{ tons/yr}$  (Uncontrolled Emissions)

Calculation:  $(5,819 \text{ VMT/yr}) * (1.71 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) * (1-50/100) = 1.67 \text{ tons/yr}$  (Apply 50% control efficiency)

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

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

Emission Factor =  $k * (s / 12)^a * (W / 3)^b = 0.17 \text{ lb/VMT}$

Where: k = constant = 0.15 lbs/VMT (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)

s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

W = mean vehicle weight = 25.22 tons (Application Info)

a = constant = 0.9 (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)

b = constant = 0.45 (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% =  $(365 - 120) / 365$  (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation:  $(5,819 \text{ VMT/yr}) * (0.17 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) = 0.33 \text{ tons/yr}$  (Uncontrolled Emissions)

Calculation:  $(5,819 \text{ VMT/yr}) * (0.17 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) * (1-50/100) = 0.17 \text{ tons/yr}$  (Apply 50% control efficiency)

#### **EU008b Haul Roads - Ore from east side (above 5000 feet)**

Vehicle Miles Traveled (VMT) per Day = 7,120 VMT/yr (Application Info)

VMT per hour =  $(7,120 \text{ VMT/yr}) / (8760 \text{ hrs/yr}) = 0.81 \text{ VMT/hr}$

Hours of Operation = 8,760 hrs/yr

Number of days > 0.01 inches of rain = 120 days/yr (AP-42, Section 13.2.2, Figure 13.2.2-1, 11/06)

#### **PM Emissions:**

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

Emission Factor =  $k * (s / 12)^a * (W / 3)^b = 10.51 \text{ lb/VMT}$

Where: k = constant = 4.9 lbs/VMT (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

W = mean vehicle weight = 68 tons (Application Info)

a = constant = 0.7 (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

b = constant = 0.45 (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% =  $(365 - 120) / 365$  (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation:  $(7,120 \text{ VMT/yr}) * (10.51 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) = 25.11 \text{ tons/yr}$  (Uncontrolled Emissions)

Calculation:  $(7,120 \text{ VMT/yr}) * (10.51 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) * (1-50/100) = 12.56 \text{ tons/yr}$  (Apply 50% control efficiency)

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

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

Emission Factor =  $k * (s / 12)^a * (W / 3)^b = 2.68 \text{ lb/VMT}$

Where: k = constant = 1.5 lbs/VMT (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

W = mean vehicle weight = 68 tons (Application Info)

a = constant = 0.9 (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

b = constant = 0.45 (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% =  $(365 - 120) / 365$  (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation:  $(7,120 \text{ VMT/yr}) * (2.68 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) = 6.40 \text{ tons/yr}$  (Uncontrolled Emissions)

Calculation:  $(7,120 \text{ VMT/yr}) * (2.68 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) * (1-50/100) = 3.20 \text{ tons/yr}$  (Apply 50% control efficiency)

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

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

$$\text{Emission Factor} = k * (s / 12)^a * (W / 3)^b = 0.27 \text{ lb/VMT}$$

Where: k = constant = 0.15 lbs/VMT (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)  
 s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

W = mean vehicle weight = 68 tons (Application Info)  
 a = constant = 0.9 (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)  
 b = constant = 0.45 (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% = (365 - 120) / 365 (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation: (7,120 VMT/yr) \* (0.27 lb/VMT) \* (67%) \* (ton/2000 lb) = 0.64 tons/yr (Uncontrolled Emissions)

Calculation: (7,120 VMT/yr) \* (0.27 lb/VMT) \* (67%) \* (ton/2000 lb) \* (1-50/100) = 0.32 tons/yr (Apply 50% control efficiency)

**EU008c Haul Roads - Ore to coarse ore pile from west side**

Vehicle Miles Traveled (VMT) per Day = 377 VMT/yr (Application Info)

VMT per hour = (377 VMT/yr) / (8760 hrs/yr) = 0.04 VMT/hr

Hours of Operation = 8,760 hrs/yr

Number of days > 0.01 inches of rain = 120 days/yr (AP-42, Section 13.2.2, Figure 13.2.2-1, 11/06)

**PM Emissions:**

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

$$\text{Emission Factor} = k * (s / 12)^a * (W / 3)^b = 10.65 \text{ lb/VMT}$$

Where: k = constant = 4.9 lbs/VMT (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)  
 s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

W = mean vehicle weight = 70 tons (Application Info)  
 a = constant = 0.7 (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)  
 b = constant = 0.45 (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% = (365 - 120) / 365 (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation: (377 VMT/yr) \* (10.65 lb/VMT) \* (67%) \* (ton/2000 lb) = 1.35 tons/yr (Uncontrolled Emissions)

Calculation: (377 VMT/yr) \* (10.65 lb/VMT) \* (67%) \* (ton/2000 lb) \* (1-50/100) = 0.67 tons/yr (Apply 50% control efficiency)

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

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

$$\text{Emission Factor} = k * (s / 12)^a * (W / 3)^b = 2.71 \text{ lb/VMT}$$

Where: k = constant = 1.5 lbs/VMT (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)  
 s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

W = mean vehicle weight = 70 tons (Application Info)  
 a = constant = 0.9 (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)  
 b = constant = 0.45 (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% = (365 - 120) / 365 (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation: (377 VMT/yr) \* (2.71 lb/VMT) \* (67%) \* (ton/2000 lb) = 0.34 tons/yr (Uncontrolled Emissions)

Calculation: (377 VMT/yr) \* (2.71 lb/VMT) \* (67%) \* (ton/2000 lb) \* (1-50/100) = 0.17 tons/yr (Apply 50% control efficiency)

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

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

$$\text{Emission Factor} = k * (s / 12)^a * (W / 3)^b = 0.27 \text{ lb/VMT}$$

Where:  $k = \text{constant} = 0.15 \text{ lbs/VMT}$  (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)  
 $s = \text{surface silt content} = 4.8 \%$  (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

$W = \text{mean vehicle weight} = 70 \text{ tons}$  (Application Info)

$a = \text{constant} = 0.9$  (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)

$b = \text{constant} = 0.45$  (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% =  $(365 - 120) / 365$  (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation:  $(377 \text{ VMT/yr}) * (0.27 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) = 0.03 \text{ tons/yr}$  (Uncontrolled Emissions)

Calculation:  $(377 \text{ VMT/yr}) * (0.27 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) * (1-50/100) = 0.02 \text{ tons/yr}$  (Apply 50% control efficiency)

#### **EU008d Haul Roads - Waste rock tailings to embankment/storage**

Vehicle Miles Traveled (VMT) per Day = 56,638 VMT/yr (Application Info)

VMT per hour =  $(56,638 \text{ VMT/yr}) / (8760 \text{ hrs/yr}) = 6.47 \text{ VMT/hr}$

Hours of Operation = 8,760 hrs/yr

Number of days > 0.01 inches of rain = 120 days/yr (AP-42, Section 13.2.2, Figure 13.2.2-1, 11/06)

#### **PM Emissions:**

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

Emission Factor =  $k * (s / 12)^a * (W / 3)^b = 10.65 \text{ lb/VMT}$

Where:  $k = \text{constant} = 4.9 \text{ lbs/VMT}$  (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

$s = \text{surface silt content} = 4.8 \%$  (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

$W = \text{mean vehicle weight} = 70 \text{ tons}$  (Application Info)

$a = \text{constant} = 0.7$  (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

$b = \text{constant} = 0.45$  (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% =  $(365 - 120) / 365$  (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation:  $(56,638 \text{ VMT/yr}) * (10.65 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) = 202.39 \text{ tons/yr}$  (Uncontrolled Emissions)

Calculation:  $(56,638 \text{ VMT/yr}) * (10.65 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) * (1-50/100) = 101.19 \text{ tons/yr}$  (Apply 50% control efficiency)

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

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

Emission Factor =  $k * (s / 12)^a * (W / 3)^b = 2.71 \text{ lb/VMT}$

Where:  $k = \text{constant} = 1.5 \text{ lbs/VMT}$  (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

$s = \text{surface silt content} = 4.8 \%$  (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

$W = \text{mean vehicle weight} = 70 \text{ tons}$  (Application Info)

$a = \text{constant} = 0.9$  (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

$b = \text{constant} = 0.45$  (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% =  $(365 - 120) / 365$  (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation:  $(56,638 \text{ VMT/yr}) * (2.71 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) = 51.58 \text{ tons/yr}$  (Uncontrolled Emissions)

Calculation:  $(56,638 \text{ VMT/yr}) * (2.71 \text{ lb/VMT}) * (67\%) * (\text{ton}/2000 \text{ lb}) * (1-50/100) = 25.79 \text{ tons/yr}$  (Apply 50% control efficiency)

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

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

Emission Factor =  $k * (s / 12)^a * (W / 3)^b = 0.27 \text{ lb/VMT}$

Where:  $k = \text{constant} = 0.15 \text{ lbs/VMT}$  (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)

$s = \text{surface silt content} = 4.8 \%$  (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-

1, 11/06)

W = mean vehicle weight = 70 tons (Application Info)

a = constant = 0.9 (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)

b = constant = 0.45 (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% = (365 - 120) / 365 (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation: (56,638 VMT/yr) \* (0.27 lb/VMT) \* (67%) \* (ton/2000 lb) = 5.16 tons/yr (Uncontrolled Emissions)

Calculation: (56,638 VMT/yr) \* (0.27 lb/VMT) \* (67%) \* (ton/2000 lb) \* (1-50/100) = 2.58 tons/yr (Apply 50% control efficiency)

#### **EU008e Haul Roads - Light duty vehicle traffic on unpaved roads**

Vehicle Miles Traveled (VMT) per Day = 250,000 VMT/yr (Application Info)

VMT per hour = (250,000 VMT/yr) / (8760 hrs/yr) = 28.54 VMT/hr

Hours of Operation = 8,760 hrs/yr

Number of days > 0.01 inches of rain = 120 days/yr (AP-42, Section 13.2.2, Figure 13.2.2-1, 11/06)

#### **PM Emissions:**

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

Emission Factor =  $k * (s / 12)^a * (S / 30)^d / (M/0.5)^c = 0.90 \text{ lb/VMT}$

Where: k = constant = 6 lbs/VMT (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)

s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

S = mean vehicle speed (mph) = 15 mph (Application Info)

a = constant = 1 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)

d = constant = 0.3 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)

M = surface material moisture content = 6.49% (Average value, AP 42, Table 13.2.2-3, 11/06)

c = constant = 0.3 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% = (365 - 120) / 365 (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation: (250,000 VMT/yr) \* (0.90 lb/VMT) \* (67%) \* (ton/2000 lb) = 75.81 tons/yr (Uncontrolled Emissions)

Calculation: (250,000 VMT/yr) \* (0.90 lb/VMT) \* (67%) \* (ton/2000 lb) \* (1-50/100) = 37.90 tons/yr (Apply 50% control efficiency)

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

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

Emission Factor =  $k * (s / 12)^a * (S / 30)^d / (M/0.5)^c = 0.25 \text{ lb/VMT}$

Where: k = constant = 1.5 lbs/VMT (Value for PM10, AP 42, Table 13.2.2-2, 11/06)

s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

S = mean vehicle speed (mph) = 15 mph (Application Info)

a = constant = 1 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)

d = constant = 0.5 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)

M = surface material moisture content = 6.49% (Average value, AP 42, Table 13.2.2-3, 11/06)

c = constant = 0.2 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% = (365 - 120) / 365 (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation: (250,000 VMT/yr) \* (0.25 lb/VMT) \* (67%) \* (ton/2000 lb) = 21.32 tons/yr (Uncontrolled Emissions)

Calculation: (250,000 VMT/yr) \* (0.25 lb/VMT) \* (67%) \* (ton/2000 lb) \* (1-50/100) = 10.66 tons/yr (Apply 50% control efficiency)

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

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

Emission Factor =  $k * (s / 12)^a * (S / 30)^d / (M/0.5)^c = 0.03 \text{ lb/VMT}$

Where: k = constant = 0.15 lbs/VMT (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)

s = surface silt content = 4.8 % (Mean value, sand/gravel processing, plant road, AP 42, Table 13.2.2-1, 11/06)

S = mean vehicle speed (mph) = 15 mph (Application Info)

a = constant = 1 (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)

d = constant = 0.5 (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)

M = surface material moisture content = 6.49% (Average value, AP 42, Table 13.2.2-3, 11/06)

c = constant = 0.2 (Value for PM<sub>2.5</sub>, AP 42, Table 13.2.2-2, 11/06)

Natural mitigation = 67% = (365 - 120) / 365 (AP-42, Section 13.2.2, Equation (2), 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation: (250,000 VMT/yr) \* (0.03 lb/VMT) \* (67%) \* (ton/2000 lb) = 2.13 tons/yr (Uncontrolled Emissions)

Calculation: (250,000 VMT/yr) \* (0.03 lb/VMT) \* (67%) \* (ton/2000 lb) \* (1-50/100) = 1.07 tons/yr (Apply 50% control efficiency)

### **EU009 Diesel Use**

Operational Capacity of Facility = 50,690 MMBtu/yr (Application Info)

#### **Total PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions:**

Emission Factor = 0.31 lb/MMBtu (All PM < 1 mm, AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (50,690 MMBtu/yr) \* (0.31 lb/MMBtu) \* (ton/2000 lb) = 7.86 ton/yr

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

Emission Factor = 4.41 lb/MMBtu (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (50,690 MMBtu/yr) \* (4.41 lb/MMBtu) \* (ton/2000 lb) = 111.77 ton/yr

#### **CO Emissions:**

Emission Factor = 0.95 lb/MMBtu (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (50,690 MMBtu/yr) \* (0.95 lb/MMBtu) \* (ton/2000 lb) = 24.08 ton/yr

#### **VOC Emissions:**

Emission Factor = 0.36 lb/MMBtu (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)

Calculation: (50,690 MMBtu/yr) \* (0.36 lb/MMBtu) \* (ton/2000 lb) = 9.12 ton/yr

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

Emission Factor = 0.29 lb/MMBtu (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (50,690 MMBtu/yr) \* (0.29 lb/MMBtu) \* (ton/2000 lb) = 7.35 ton/yr

#### **CO<sub>2</sub> Emissions:**

Emission Factor = 164 lb/MMBtu (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (50,690 MMBtu/yr) \* (164 lb/MMBtu) \* (ton/2000 lb) = 4,157 ton/yr

### **EU010 Gasoline Use**

Operational Capacity of Facility = 8,450 MMBtu/yr (Application Info)

#### **Total PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions:**

Emission Factor = 0.1 lb/MMBtu (All PM < 1 mm, AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,450 MMBtu/yr) \* (0.1 lb/MMBtu) \* (ton/2000 lb) = 0.42 ton/yr

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

Emission Factor = 1.63 lb/MMBtu (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,450 MMBtu/yr) \* (1.63 lb/MMBtu) \* (ton/2000 lb) = 6.89 ton/yr

**CO Emissions:**

Emission Factor = 0.99 lb/MMBtu (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,450 MMBtu/yr) \* (0.99 lb/MMBtu) \* (ton/2000 lb) = 4.18 ton/yr

**VOC Emissions:**

Emission Factor = 3.03 lb/MMBtu (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)

Calculation: (8,450 MMBtu/yr) \* (3.03 lb/MMBtu) \* (ton/2000 lb) = 12.80 ton/yr

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

Emission Factor = 0.084 lb/MMBtu (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,450 MMBtu/yr) \* (0.084 lb/MMBtu) \* (ton/2000 lb) = 0.35 ton/yr

**CO<sub>2</sub> Emissions:**

Emission Factor = 154 lb/MMBtu (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,450 MMBtu/yr) \* (154 lb/MMBtu) \* (ton/2000 lb) = 651 ton/yr

**EU011 - Diesel Engine Paste Plant Flush Pump**

Operational Capacity of Engine = 225 hp

Hours of Operation = 500.00 hrs/yr

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

Emission Factor = 0.0022 lbs/hp-hr (All PM < 1 mm, AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hrs/yr) \* (225 hp) \* (0.0022 lbs/hp-hr) \* (ton/2000 lb) = 0.12 ton/yr

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

Emission Factor = 0.031 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hrs/yr) \* (225 hp) \* (0.031 lbs/hp-hr) \* (ton/2000 lb) = 1.74 ton/yr

**CO Emissions:**

Emission Factor = 0.00668 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hrs/yr) \* (225 hp) \* (0.00668 lbs/hp-hr) \* (ton/2000 lb) = 0.38 ton/yr

**VOC Emissions:**

Emission Factor = 0.00247 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hrs/yr) \* (225 hp) \* (0.00247 lbs/hp-hr) \* (ton/2000 lb) = 0.14 ton/yr

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

Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hrs/yr) \* (225 hp) \* (0.00205 lbs/hp-hr) \* (ton/2000 lb) = 0.115 ton/yr

**CO<sub>2</sub> Emissions:**

Emission Factor = 1.15 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hrs/yr) \* (225 hp) \* (1.15 lbs/hp-hr) \* (ton/2000 lb) = 64.69 ton/yr

**EU012a - Concrete Batch Plant Operations**

Maximum Process Rate = 28 ton/day (Supplied info) aggregate

Maximum Process Rate = 32 ton/day (Supplied info) sand

Maximum Hours of Operation = 365 days/yr

Number of aggregate and sand transfers to hopper = 3 transfers (Application Info)

***Aggregate Delivery to Ground Storage***

**Filterable PM Emissions:**

Emission Factor = 0.0069 lb/ton (AP 42, Table 11.12-5, 06/06)

Calculation: (28 ton/day) \* (3 transfers) \* (365 days/yr) \* (0.0069 lb/ton) \* (ton/2000 lb) = 0.106 ton/yr

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

Emission Factor = 0.0033 lb/ton (AP 42, Table 11.12-5, 06/06)

Calculation: (28 ton/day) \* (3 transfers) \* (365 days/yr) \* (0.0033 lb/ton) \* (ton/2000 lb) = 0.051 ton/yr

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

Emission Factor = 0.001035 lb/ton (AP 42, Appendix B.2, Table B.2.2, Category 3, PM<sub>2.5</sub> = 15% of PM, 09/90)

Calculation: (28 ton/day) \* (3 transfers) \* (365 days/yr) \* (0.001035 lb/ton) \* (ton/2000 lb) = 0.016 ton/yr

***Sand Delivery to Ground Storage***

**Filterable PM Emissions:**

Emission Factor = 0.0021 lb/ton (AP 42, Table 11.12-5, 06/06)

Calculation: (32 ton/day) \* (3 transfers) \* (365 days/yr) \* (0.0021 lb/ton) \* (ton/2000 lb) = 0.037 ton/yr

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

Emission Factor = 0.00099 lb/ton (AP 42, Table 11.12-5, 06/06)

Calculation: (32 ton/day) \* (3 transfers) \* (365 days/yr) \* (0.00099 lb/ton) \* (ton/2000 lb) = 0.017 ton/yr

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

Emission Factor = 0.000315 lb/ton (AP 42, Appendix B.2, Table B.2.2, Category 3, PM<sub>2.5</sub> = 15% of PM, 09/90)

Calculation: (32 ton/day) \* (3 transfers) \* (365 days/yr) \* (0.000315 lb/ton) \* (ton/2000 lb) = 0.006 ton/yr

***Aggregate Transfer to Hopper***

**Filterable PM Emissions:**

Emission Factor = 0.0048 lb/ton (AP 42, Table 11.12-5, 06/06)

Calculation: (60 ton/day) \* (365 days/yr) \* (0.0048 lb/ton) \* (ton/2000 lb) = 0.053 ton/yr

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

Emission Factor = 0.0028 lb/ton (AP 42, Table 11.12-5, 06/06)

Calculation: (60 ton/day) \* (365 days/yr) \* (0.0028 lb/ton) \* (ton/2000 lb) = 0.031 ton/yr

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

Emission Factor = 0.00072 lb/ton (AP 42, Appendix B.2, Table B.2.2, Category 3, PM<sub>2.5</sub> = 15% of PM, 09/90)

Calculation: (60 ton/day) \* (365 days/yr) \* (0.00072 lb/ton) \* (ton/2000 lb) = 0.008 ton/yr

**EU012b - Concrete Batch Plant Silo operations**

Maximum Process Rate = 12.00000 tons/day (Supplied info)

Maximum Hours of Operation = 365 days/yr

***Soda Ash Storage/Loading***

**Filterable PM Emissions:**

Emission Factor = 0.00099 lb/ton (AP 42, Table 11.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (12 tons/day) \* (365 days/yr) \* (0.00099 lb/ton) \* (ton/2000 lb) = 0.002 ton/yr

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

Emission Factor = 0.00099 lb/ton (AP 42, Table 11.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (12 tons/day) \* (365 days/yr) \* (0.00099 lb/ton) \* (ton/2000 lb) = 0.002 ton/yr

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

Emission Factor = 0.00099 lb/ton (AP 42, Table 11.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (12 tons/day) \* (365 days/yr) \* (0.00099 lb/ton) \* (ton/2000 lb) = 0.002 ton/yr

***Truck Loading (truck mix)***

**Filterable PM Emissions:**

Emission Factor = 0.098 lb/ton (AP 42, Table 11.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (12 tons/day) \* (365 days/yr) \* (0.098 lb/ton) \* (ton/2000 lb) = 0.215 ton/yr

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

Emission Factor = 0.098 lb/ton (AP 42, Table 11.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (12 tons/day) \* (365 days/yr) \* (0.098 lb/ton) \* (ton/2000 lb) = 0.215 ton/yr

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

Emission Factor = 0.098 lb/ton (AP 42, Table 11.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (12 tons/day) \* (365 days/yr) \* (0.098 lb/ton) \* (ton/2000 lb) = 0.215 ton/yr

**EU015 - 50-ton Soda Ash Silo**

Maximum Process Rate = 8.00000 tons/day (Supplied info)

Maximum Hours of Operation = 365 days/yr

***Soda Ash Storage/Loading***

**Filterable PM Emissions:**

Emission Factor = 0.0051 lb/ton (AP 42, Table 8.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (8 tons/day) \* (365 days/yr) \* (0.0051 lb/ton) \* (ton/2000 lb) = 0.007 ton/yr

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

Emission Factor = 0.0051 lb/ton (AP 42, Table 8.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (8 tons/day) \* (365 days/yr) \* (0.0051 lb/ton) \* (ton/2000 lb) = 0.007 ton/yr

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

Emission Factor = 0.0051 lb/ton (AP 42, Table 8.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (8 tons/day) \* (365 days/yr) \* (0.0051 lb/ton) \* (ton/2000 lb) = 0.007 ton/yr

***Soda Ash Transfer (discharge to mill apron feeder)***

**Filterable PM Emissions:**

Emission Factor = 0.0002 lb/ton (AP 42, Table 8.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (8 tons/day) \* (365 days/yr) \* (0.0002 lb/ton) \* (ton/2000 lb) = 0.000 ton/yr

**Filterable PM10 Emissions:**

Emission Factor = 0.0002 lb/ton (AP 42, Table 8.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (8 tons/day) \* (365 days/yr) \* (0.0002 lb/ton) \* (ton/2000 lb) = 0.000 ton/yr

**Filterable PM2.5 Emissions:**

Emission Factor = 0.0002 lb/ton (AP 42, Table 8.12-2, MDEQ assumes PM=PM10=PM2.5, 07/93)

Calculation: (8 tons/day) \* (365 days/yr) \* (0.0002 lb/ton) \* (ton/2000 lb) = 0.000 ton/yr

**EU016 - Propane-fired combustion (facility-wide)**

Maximum Process Rate = 149 MMBtu/hr (Application Information)

Maximum Process Rate = 1.62842 10<sup>3</sup> gal/hr (91.5 MMBtu/10<sup>3</sup> gal from AP-42, Table 1.5-1, footnote a, 07/08)

Maximum Hours of Operation = 8,760 hrs/yr

**Filterable PM Emissions:**

Emission Factor = 0.2 lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, Commercial boiler, all PM<10um, 07/08)

Calculation: (1.628 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (0.2 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 1.426 ton/yr

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

Emission Factor = 0.2 lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, Commercial boiler, all PM<10um, 07/08)

Calculation: (1.628 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (0.2 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 1.426 ton/yr

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

Emission Factor = 0.2 lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, Commercial boiler, MDEQ assumes all PM<2.5um, 07/08)

Calculation: (1.628 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (0.2 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 1.426 ton/yr

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

Emission Factor = 0.5 lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, Commercial boiler, 07/08)

Calculation: (1.628 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (0.5 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 3.566 ton/yr

**CO Emissions:****Not Including 28 MMBtu/hr (0.306 10<sup>3</sup> gal/yr) portal heater which has vendor-guaranteed emission rates**

Emission Factor = 7.5 lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, Commercial boiler, 07/08)

Calculation: (1.628 10<sup>3</sup> gal/hr - 0.306 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (7.5 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 43.441 ton/yr

**CO Emissions:****Including 28 MMBtu/hr (0.306 10<sup>3</sup> gal/yr) portal heater which has vendor-guaranteed emission rates**

Calculation: (43.441 ton/yr) + (36.617) = 80.058 ton/yr

**NO<sub>x</sub> Emissions:****Not Including 28 MMBtu/hr (0.306 10<sup>3</sup> gal/yr) portal heater which has vendor-guaranteed emission rates**

Emission Factor = 13 lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, Commercial boiler, 07/08)

Calculation: (1.628 10<sup>3</sup> gal/hr - 0.306 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (13 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 75.298 ton/yr

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

**Including 28 MMBtu/hr (0.306 10<sup>3</sup> gal/yr) portal heater which has vendor-guaranteed emission rates**

Calculation: (75.298 ton/yr) + (12.790 ton/yr) = 88.087 ton/yr

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

Emission Factor = 0.10S lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, S = Sulfur content of fuel in gr/100 ft<sup>3</sup>, Commercial boiler, 07/08)

S = 15 gr/100 ft<sup>3</sup> (Based on information historically submitted by Stillwater for propane)

Emission Factor = 1.5 lb/10<sup>3</sup> gal

Calculation: (1.628 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (1.5 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 10.699 ton/yr

**VOC Emissions:**

Emission Factor = 0.8 lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, Commercial boiler, 07/08, VOC = TOC - CH<sub>4</sub>)

Calculation: (1.628 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (0.8 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 5.706 ton/yr

**CH<sub>4</sub> Emissions:**

Emission Factor = 0.2 lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, Commercial boiler, 07/08)

Calculation: (1.628 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (0.2 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 1.426 ton/yr

CO<sub>2</sub>e = 1.426 \* 21 = 29.956 ton/yr (CH<sub>4</sub> GWP = 21, 40 CFR 98, Subpart A, Table A-1)

**N<sub>2</sub>O Emissions:**

Emission Factor = 0.9 lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, Commercial boiler, 07/08)

Calculation: (1.628 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (0.9 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 6.419 ton/yr

CO<sub>2</sub>e = 6.419 \* 310 = 1,989.956 ton/yr

**CO<sub>2</sub> Emissions:**

Emission Factor = 12500 lb/10<sup>3</sup> gal (AP 42, Table 1.5-1, Commercial boiler, 07/08)

Calculation: (1.628 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (12500 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 89,156 ton/yr

**CO<sub>2</sub>e Emissions:**

CO<sub>2</sub>e(Total) = CO<sub>2</sub> + CO<sub>2</sub>e(CH<sub>4</sub>) + CO<sub>2</sub>e(N<sub>2</sub>O)

CO<sub>2</sub>e(Total) = 89,156 + 30 + 1,990 = 91,176 ton/yr

**28 MMBtu/hr Propane-Fired Portal Heater (5000 East Portal)**

While emissions from this heater are included in the facility-wide propane combustion calculations, NO<sub>x</sub> and CO emission contributions from this unit are based on vendor guarantees.

Maximum Process Rate = 0.30601 10<sup>3</sup> gal/hr (91.5 MMBtu/10<sup>3</sup> gal from AP-42, Table 1.5-1, footnote a, 07/08)

Maximum Hours of Operation = 8,760 hrs/yr

**CO Emissions:**

Emission Factor = 8.36 lb/hr (Vendor Guarantee)

Calculation: (8760 hrs/yr) \* (8.36 lb/hr) \* (ton/2000 lb) = 36.617 ton/yr

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

Emission Factor = 2.92 lb/hr (Vendor Guarantee)

Calculation: (8760 hrs/yr) \* (2.92 lb/hr) \* (ton/2000 lb) = 12.790 ton/yr

### **IEU017 - Diesel Engine Shaft Generator**

Operational Capacity of Engine = 947 hp

Hours of Operation = 500.00 hours

#### **Total PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions:**

Emission Factor = 0.0007 lbs/hp-hr (All PM < 1 mm, AP-42, Sec. 3.4, Table 3.4-1, 10/96)

Calculation: (500 ton/yr) \* (947 lbs/hp-hr) \* (0.0007 lbs/hp-hr) \* (ton/2000 lb) = 0.17 ton/yr

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

Emission Factor = 0.024 lbs/hp-hr (AP-42, Sec. 3.4, Table 3.4-1, 10/96)

Calculation: (500 ton/yr) \* (947 lbs/hp-hr) \* (0.024 lbs/hp-hr) \* (ton/2000 lb) = 5.68 ton/yr

#### **CO Emissions:**

Emission Factor = 0.0055 lbs/hp-hr (AP-42, Sec. 3.4, Table 3.4-1, 10/96)

Calculation: (500 ton/yr) \* (947 lbs/hp-hr) \* (0.0055 lbs/hp-hr) \* (ton/2000 lb) = 1.30 ton/yr

#### **VOC Emissions:**

Emission Factor = 0.00064155 lbs/hp-hr (AP-42, Sec. 3.4, Table 3.4-1, 10/96)

Calculation: (500 ton/yr) \* (947 lbs/hp-hr) \* (0.00064155 lbs/hp-hr) \* (ton/2000 lb) = 0.15 ton/yr

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

Emission Factor = 0.0004045 lbs/hp-hr (AP-42, Sec. 3.4, Table 3.4-1, S=500ppm, 10/96)

Calculation: (500 ton/yr) \* (947 lbs/hp-hr) \* (0.0004045 lbs/hp-hr) \* (ton/2000 lb) = 0.096 ton/yr

#### **CO<sub>2</sub> Emissions:**

Emission Factor = 1.16 lbs/hp-hr (AP-42, Sec. 3.4, Table 3.4-1, 10/96)

Calculation: (500 ton/yr) \* (947 lbs/hp-hr) \* (1.16 lbs/hp-hr) \* (ton/2000 lb) = 274.63 ton/yr

### **IEU06 - Paste Plant Operations**

Maximum Process Rate = 4,400 ton/yr (Supplied info) cement

Maximum Hours of Operation = 365 days/yr

#### ***Aggregate Delivery to Ground Storage***

##### **Filterable PM Emissions:**

Emission Factor = 0.73 lb/ton (AP 42, Table 11.12-5, 06/06)

Calculation: (4,400 ton/yr) \* (0.73 lb/ton) \* (ton/2000 lb) = 1.606 ton/yr

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

Emission Factor = 0.47 lb/ton (AP 42, Table 11.12-5, 06/06)

Calculation: (4,400 ton/yr) \* (0.47 lb/ton) \* (ton/2000 lb) = 1.034 ton/yr

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

Emission Factor = 0.1095 lb/ton (AP 42, Appendix B.2, Table B.2.2, Category 3, PM<sub>2.5</sub> = 15% of PM, 09/90)

Calculation: (4,400 ton/yr) \* (0.1095 lb/ton) \* (ton/2000 lb) = 0.241 ton/yr

### **IEU07 - Open burning**

Operational Capacity of Facility = 40 ton/yr (Application Info)

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

Emission Factor = 17 lb/ton (Assume PM = PM<sub>10</sub> = PM<sub>2.5</sub>, Unspecified Forest Residue, AP-42, Sec. 2.5, Table 2.5-5, 10/92)

Calculation: (40 ton/yr) \* (17 lb/ton) \* (ton/2000 lb) = 0.34 ton/yr

**CO Emissions:**

Emission Factor = 140 lb/ton (Assume PM = PM<sub>10</sub> = PM<sub>2.5</sub>, Unspecified Forest Residue, AP-42, Sec. 2.5, Table 2.5-5, 10/92)

Calculation: (40 ton/yr) \* (140 lb/ton) \* (ton/2000 lb) = 2.80 ton/yr

**VOC Emissions:**

Emission Factor = 19 lb/ton (Assume PM = PM<sub>10</sub> = PM<sub>2.5</sub>, Unspecified Forest Residue, AP-42, Sec. 2.5, Table 2.5-5, 10/92)

Calculation: (40 ton/yr) \* (19 lb/ton) \* (ton/2000 lb) = 0.38 ton/yr

**V. Existing Air Quality**

From 1988 through June of 2002, Stillwater Mining operated an ambient PM<sub>10</sub> sampling program around the mine area. Measured PM<sub>10</sub> concentrations were consistently below applicable standards. The ambient 24-hour standard is 150 micrograms per cubic meter (µg/m<sup>3</sup>), and the ambient annual standard is 50 µg/m<sup>3</sup>. Measured PM<sub>10</sub> results are summarized in the table below for calendar years 1995 and 1996, which are representative of all years monitoring was conducted.

Summary of the PM <sub>10</sub> Data for 1995 and 1996 Stillwater Mine, Nye, Montana					
Site	Sample Year	Maximum 24-hour (ug/m <sup>3</sup> )	Second Highest 24-hour (ug/m <sup>3</sup> )	Arithmetic Annual Mean (ug/m <sup>3</sup> )	Number of Samples
1 (Upwind)	1995	26	22	8.1	76
1 (Upwind)	1996	33	29	8.1	91
2 (Downwind)	1995	28	26	9.5	76
2 (Downwind)	1996	39	35	9.8	91

**VI. Ambient Air Quality Impact Analysis**

The current permitting action is an administrative permit action; therefore, the Department did not conduct an ambient air quality impact analysis.

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

This permitting action will not result in an increase of emissions from the facility and is considered an administrative action; therefore, an environmental assessment is not required.

Analysis Prepared By: Ed Warner  
 Date: January 4, 2012