

# STATE OF MISSOURI



# PERMIT BOOK

## DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

### PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 102010-002

Project Number: 2010-05-012

Parent Company: Ash Grove Aggregates Inc.

Parent Company Address: P.O. Box 70, Butler, MO 64730

Installation Name: Ash Grove Aggregates Inc.

Installation ID: 167-0022

Installation Address: 530 E. 460th Road, Fairplay, MO 65649

Location Information: Polk County, S23, T33N, R24W

Application for Authority to Construct was made for the installation of a new 1,071 horsepower generator. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

OCT - 5 2010  
EFFECTIVE DATE

A handwritten signature in black ink, appearing to read "James L. Kawamura".  
DIRECTOR OR DESIGNEE  
DEPARTMENT OF NATURAL RESOURCES

## STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

**You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review.** In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Departments' Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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**GENERAL SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

1. Generic Plant Designation and Maximum Combined Hourly Design Rate  
Ash Grove Aggregates Inc. has been designated to be a Generic Plant Operation. The combined Maximum Hourly Design Rate (MHDR) for each of the following generic equipment types shall not exceed the rates and numbers listed below.

| Equipment Type                       | Maximum Combined Hourly Design Rate | Maximum Number of Units |
|--------------------------------------|-------------------------------------|-------------------------|
| Primary Unit(s) (Primary Crusher)    | 500 tons per hour                   | 1                       |
| Feeder/Grizzly                       | 500 tons per hour                   | 1                       |
| Crusher(s) including primary crusher | 1,500 tons per hour                 | 3                       |
| Conveyor(s), Stacker(s)              | 20,000 tons per hour                | 40                      |
| Screen(s)                            | 2,500 tons per hour                 | 5                       |
| Storage Bin(s)                       | 5,000 tons per hour                 | 10                      |
| Diesel Engine                        | 13.26 MMBTU/hr                      | 2                       |

2. Generic Plant Equipment Identification Requirement
  - A. Ash Grove Aggregates Inc. shall submit the following information to the Air Pollution Control Program's Permitting Section and the Southwest Regional Office within 15 days of actual startup.
    - 1) A master list of all equipment that will be permitted for use with the generic plant. This master list shall include at minimum the following information for each piece of equipment:
      - a) Manufacturer's name
      - b) Model number
      - c) Serial number
      - d) Actual MHDR
      - e) Date of manufacture
      - f) Any other additional information that is necessary to uniquely identify the equipment.
    - 2) A list of the core equipment that will always be utilized with the generic plant. The core equipment associated with the generic plant shall include at least one primary unit that controls the rate of the process flow (e.g., a primary crusher or primary screen).
    - 3) A determination of the applicability of 40 CFR Part 60, Subpart OOO, "Standards of Performance for Nonmetallic Mineral Processing Plants" for each piece of equipment indicating whether each piece of equipment is subject to Subpart OOO and justification for this determination.
    - 4) Ash Grove Aggregates Inc. shall notify the Air Pollution Control Program's

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**GENERAL SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

Permitting Section and the Southwest Regional Office when new equipment is added to the master list and when core equipment is changed within 30 days of the change.

- B. Ash Grove Aggregates Inc. shall maintain a list of the specific equipment currently being utilized with the generic plant. Any arrangement of the generic plant's equipment must be such that the core equipment is not bypassed in the process flow.
- 3. **Equipment Identification Requirement**  
Ash Grove Aggregates Inc. shall maintain easily read permanent markings on each component of the plant. These markings shall be the equipment's serial number or a company assigned identification number that uniquely identifies the individual component.
- 4. **Record Keeping Requirement**  
Ash Grove Aggregates Inc. shall maintain all records required by this permit for not less than five years and shall make them available to any Missouri Department of Natural Resources' personnel upon request.
- 5. **Reporting Requirement**  
Ash Grove Aggregates Inc. shall report to the Air Pollution Control Program Enforcement Section P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any exceedances of the limitations imposed by this permit.

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**SITE SPECIFIC SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

1. Best Management Practices Requirement  
Ash Grove Aggregates Inc. shall control fugitive emissions from all of the haul roads and vehicular activity areas at this site by performing Best Management Practices as defined in Attachment AA.
2. Ambient Air Impact Limitation
  - A. Ash Grove Aggregates Inc. shall not cause an exceedance of the National Ambient Air Quality Standard (NAAQS) for particulate matter less than ten microns in aerodynamic diameter (PM<sub>10</sub>) of 150.0 µg/m<sup>3</sup> 24-hour average in ambient air.
  - B. Ash Grove Aggregates Inc. shall demonstrate compliance with Special Condition 2.A using Attachment A or another equivalent form that has been approved by the Air Pollution Control Program, including an electronic form.
3. Annual Emission Limit
  - A. Ash Grove Aggregates Inc. shall emit less than 15.0 tons of PM<sub>10</sub> in any 12-month period from the entire installation.
  - B. Ash Grove Aggregates Inc. shall demonstrate compliance with Special Condition 3.A using Attachment B or another equivalent form that has been approved by the Air Pollution Control Program, including an electronic form.
4. Moisture Content Testing Requirement
  - A. Ash Grove Aggregates Inc. shall verify that the moisture content of the processed rock is greater than or equal to 1.5% by weight.
  - B. Testing shall be conducted according to the method prescribed by the American Society for Testing Materials (ASTM) D-2216, C-566 or another method approved by the Director.
  - C. The initial test shall be conducted no later than 45 days after the start of operation. A second test shall be performed the calendar year following the initial test during the months of July or August.
  - D. The test samples shall be taken from rock that has been processed by the plant.

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**SITE SPECIFIC SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

- E. The written analytical report shall include the raw data and moisture content of each sample, the test date and the original signature of the individual performing the test. The report shall be filed on-site or at the Ash Grove Aggregates Inc. main office within 30 days of completion of the required test.
  - F. If the moisture content of either of the two tests is less than the moisture content in Special Condition 4.A, another test may be performed with 15 days of the noncompliant test. If the results of that test also exceed the limit, Ash Grove Aggregates Inc. shall either:
    - 1.) Apply for a new permit to account for the revised information, or
    - 2.) Submit a plan for the installation of wet spray devices to the Air Pollution Control Program Compliance Assistance section within 10 days of the second noncompliant test. The wet spray devices shall be installed and operational within 40 days of the second noncompliant test.
  - G. In lieu of testing, Ash Grove Aggregates Inc. may obtain test results that demonstrate compliance with the moisture content in Special Condition 4.A from the supplier of the aggregate.
5. Minimum Distance to Property Boundary Requirement  
The primary emission point shall be located at least 750 feet from the nearest property boundary.
6. Concurrent Operation Restriction  
Ash Grove Aggregates Inc. is prohibited from operating whenever other plants are located at the site.
7. Diesel Engine Operation Restriction  
Ash Grove Aggregates Inc. shall only use the diesel engines to power equipment during production.
8. Record Keeping Requirement  
Ash Grove Aggregates Inc. shall maintain all records required by this permit for five years and make them available to any Missouri Department of Natural Resources personnel upon request.
9. Reporting Requirement  
Ash Grove Aggregates Inc. shall report to the Air Pollution Control Program Enforcement Section P.O. Box 176, Jefferson City, MO 65102, no later than ten days after any exceedances of the limitations imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (5) REVIEW

Project Number: 2010-05-012  
Installation ID Number: 167-0022  
Permit Number:

Ash Grove Aggregates Inc.  
530 E. 460th Road  
Fairplay, MO 65649

Complete: May 11, 2010

Parent Company:  
Ash Grove Aggregates Inc.  
P.O. Box 70  
Butler, MO 64730

Polk County, S23, T33N, R24W

PROJECT DESCRIPTION

Ash Grove Aggregates, Inc. operates an existing rock crushing plant that has a maximum hourly design rate (MHDR) of 500 tons per hour. Per Permit No. 032010-002, this plant was originally powered by a diesel engine rated at 5.48 MMBTU/hr. Ash Grove Aggregates, Inc. has requested to add an additional diesel engine rated at 7.78 MMBTU/hr to their rock crushing plant. Because a generic permit was issued to this plant, all equipment at this plant was evaluated in this permit.

The diesel engines of this permit are defined as nonroad engines per 40 CFR 1068.30(1)(iii) because of its portability. If these engines remain at this location for more than 12 consecutive months they will be subject to 40 CFR 60 Subpart IIII, "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines" and 40 CFR 63 Subpart ZZZZ, "National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines."

Ash Grove Aggregates, Inc. will use one of the methods described in Attachment AA, "Best Management Practices," to control emissions from haul roads and vehicular activity areas. The company will also test the moisture content of the processed rock to ensure that it is greater than 1.5% by weight. This facility is not permitted to operate with any other plants at this site. If the company decides to operate with other plants at this site, a new permit review will be required.

This installation is located in Polk County, an attainment area for all criteria pollutants. This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability. Ash Grove Aggregates, Inc. shall send in an amendment to update their Basic Operating Permit to reflect this additional generator.

## TABLES

The table below summarizes the emissions of this plant. The potential emissions of the application represent the emissions of all equipment and activities assuming continuous operation (8760 hours per year). The conditioned potential emissions are based on a voluntary PM<sub>10</sub> limit to avoid dispersion modeling requirements found in 10 CSR 10-6.060 Section (6).

**Table 1: Emissions Summary (tons per year)**

| Air Pollutant    | De Minimis Level/ SMAL | <sup>1</sup> Existing Potential Emissions | Existing Actual Emissions | Potential Emissions of the Installation | <sup>2</sup> Conditioned Potential Emissions |
|------------------|------------------------|---|---------------------------|---|--|
| PM <sub>10</sub> | 15.0                   | <15.0                                     | N/D                       | 54.20                                   | < 15.0                                       |
| SO <sub>x</sub>  | 40.0                   | 2.64                                      | N/D                       | 25.52                                   | 6.65   |
| NO <sub>x</sub>  | 40.0                   | 20.92                                     | N/D                       | 110.46                                  | 28.81  |
| VOC              | 40.0                   | 0.54                                      | N/D                       | 5.17                                    | 1.35   |
| CO               | 100.0                  | 5.56                                      | N/D                       | 9.77                                    | 2.55   |
| Total HAPs       | 25.0                   | 0.01                                      | N/D                       | 0.10                                    | 0.03   |

N/D = Not Determined

<sup>1</sup> Existing potential emissions are from Permit No. 032010-002.

<sup>2</sup> The conditioned potential emissions are based on a voluntary limit for PM<sub>10</sub>. All other pollutants' emissions are indirectly limited. Due to the close proximity in timing, the addition of the second generator was combined with the previous permit.

**Table 2: Ambient Air Quality Impact Analysis**

| Pollutant                     | <sup>1</sup> NAAQS (µg/m <sup>3</sup> ) | Averaging Time | <sup>2</sup> Maximum Modeled Impact (µg/m <sup>3</sup> ) | Limited Impact (µg/m <sup>3</sup> ) | Background (µg/m <sup>3</sup> ) | <sup>3</sup> Daily Limit (tons/day) |
|-------------------------------|---|----------------|--|-------------------------------------|---------------------------------|-------------------------------------|
| <sup>4</sup> PM <sub>10</sub> | 150.0                                   | 24-hour        | 190.05   | 130.0                               | 20.0                            | 8,533.89                            |

<sup>1</sup> National Ambient Air Quality Standards (NAAQS).

<sup>2</sup> Modeled impact at maximum capacity with controls.

<sup>3</sup> Indirect production limit based on voluntary limit for PM<sub>10</sub>.

<sup>4</sup> Solitary operation.

## EMISSIONS CALCULATIONS

Emissions for the project were calculated using emission factors found in the United States Environmental Protection Agency (EPA) document AP-42 *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Fifth Edition (AP-42).

Emissions from the rock-crushing equipment were calculated using emission factors from AP-42 Section 11.19.2 "Crushed Stone Processing and Pulverized Mineral Processing," August 2004. The controlled emission factors were used because the inherent moisture content of the crushed rock is greater than 1.5% weight. Emissions from haul roads and vehicular activity areas were calculated using the predictive equation from AP-42 Section 13.2.2 "Unpaved Roads," November 2006. A 90% control efficiency is applied to the emission calculations for the use of BMPs. Emissions from load-in and load-out of storage piles were calculated using the predictive equation from AP-42 Section 13.2.4. The moisture content of the aggregate is 1.5% by weight. Emissions from wind erosion of storage piles were calculated using an equation found in the Air Pollution Control Program's Emissions Inventory Questionnaire Form 2.8 "Storage Pile Worksheet."

Emissions from both generators were calculated using NO<sub>x</sub> and CO emission factors and fuel usage from the manufacture's Performance Data Reports.

### AMBIENT AIR QUALITY IMPACT ANALYSIS

An ambient air quality impact analysis (AAQIA) was performed to determine the impact of PM<sub>10</sub>. The Air Pollution Control Program requires an AAQIA of PM<sub>10</sub> for all asphalt, concrete and rock-crushing plants regardless of the level of PM<sub>10</sub> emissions if a permit is required. The AAQIA was performed using the Air Pollution Control Program's generic nomographs. For each pollutant that was modeled, the maximum concentration that occurs at or beyond the site boundary was compared to the National Ambient Air Quality Standard (NAAQS) or Risk Assessment Level (RAL) for the pollutant. The distance from the plant to the nearest site boundary is 750 feet.

This plant uses BMPs to control emissions from haul roads and vehicular activity areas, so emissions from these sources were not included in the AAQIA. Instead they were addressed as a background concentration of 20.0 µg/m<sup>3</sup> of PM<sub>10</sub> in accordance with the Air Pollution Control Program's BMPs interim policy.

### PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. The conditioned potential emissions are based on voluntary PM<sub>10</sub> limit to avoid dispersion modeling requirements found in 10 CSR 10-6.060 Section (6).

### APPLICABLE REQUIREMENTS

Ash Grove Aggregates Inc. shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

### GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110. The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.

- *Operating Permit*, 10 CSR 10-6.065. An amendment to your Basic Operating Permit to reflect the additional generator is required for this installation within 30 days of equipment startup.
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-3.090

#### SPECIFIC REQUIREMENTS

- 40 CFR 60 Subpart OOO, "Standards of Performance for Nonmetallic Mineral Processing Plants" applies to the equipment.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPS, 40 CFR 61) applies to the proposed equipment.

#### STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

\_\_\_\_\_  
 Daronn A. Williams  
 Environmental Engineer

\_\_\_\_\_  
 Date

#### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, received May 5, 2010, designating Ash Grove Aggregates Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southwest Regional Office Site Survey, dated June 13, 2010.
- Gen Set Package Performance Data [2WJ05948], dated March 24, 2010
- Gen Set Package Performance Data [MJE01292], dated September 3, 2010





## Attachment AA: Best Management Practices

Haul roads and vehicular activity areas shall be maintained in accordance with at least one of the following options when the portable plant is operating.

1. Pavement
  - A. The operator shall pave the area with materials such as asphalt, concrete or other materials approved by the Air Pollution Control Program. The pavement will be applied in accordance with industry standards to achieve control of fugitive emissions<sup>1</sup> while the plant is operating.
  - B. Maintenance and repair of the road surface will be conducted as necessary to ensure that the physical integrity of the pavement is adequate to achieve control of fugitive emissions from these areas while the plant is operating.
  - C. The operator shall periodically wash or otherwise clean all of the paved portions of the haul roads as necessary to achieve control of fugitive emissions from these areas while the plant is operating.
  
2. Application of Chemical Dust Suppressants
  - A. The operator shall apply a chemical dust suppressant (such as magnesium chloride, calcium chloride, lignosulfonates, etc.) to unpaved areas.
  - B. The quantities of the chemical dust suppressant shall be applied and maintained in accordance with the manufacturer's recommendation (if available) and in sufficient quantities to achieve control of fugitive emissions from these areas while the plant is operating.
  - C. The operator shall record the time, date and the amount of material applied for each application of the chemical dust suppressant agent on the above areas. The operator shall keep these records with the plant for not less than five (5) years and make these records available to Department of Natural Resources personnel upon request.
  
3. Application of Water-Documented Daily
  - A. The operator shall apply water to unpaved areas. Water shall be applied at a rate of 100 gallons per day per 1,000 square feet of unpaved or untreated surface area while the plant is operating.
  - B. Precipitation may be substituted for watering if the precipitation is greater than one quarter of one inch and is sufficient to control fugitive emissions.
  - C. Watering may also be suspended when the ground is frozen, during periods of freezing conditions when watering would be inadvisable for traffic safety reasons, or when there will be no traffic on the roads.
  - D. The operator shall record the date, volume of water application and total surface area of active haul roads or the amount of precipitation that day. The operators shall also record the rationale for not watering (e.g. freezing conditions or not operating).
  - E. The operator shall keep these records with the plant for not less than five (5) years, and the operator shall make these records available to Department of Natural Resources personnel upon request

<sup>1</sup>For purposes of this document, Control of Fugitive Emissions means to control particulate matter that is not collected by a capture system and visible emissions to the extent necessary to prevent violations of the air pollution law or regulation. (Note: control of visible emission is not the only factor to consider in protection of ambient air quality.)

**Attachment BB: Emission Calculations**  
 Ash Grove Aggregates Inc.  
 2010-05-012

| Description                     | <sup>1</sup> MHDR | MHDR Units | <sup>2</sup> PM <sub>10</sub> EF | EF Units    | Control Eff. % | Emissions (lb/hr) | <sup>3</sup> Modeling Rate (lb/hr) |
|---------------------------------|-------------------|------------|----------------------------------|-------------|----------------|-------------------|------------------------------------|
| Primary Crusher (1)             | 500.0000          | Tons       | 0.0024                           | Lbs/Ton     | 75.00          | 0.3000            | 0.0782                             |
| Feeder/Grizzly (1)              | 500.0000          | Tons       | 0.00002                          | Lbs/Ton     | 0.00           | 0.0080            | 0.0021                             |
| Other Crushers (2)              | 1000.0000         | Tons       | 0.0024                           | Lbs/Ton     | 75.00          | 0.6000            | 0.1565                             |
| Conveyors, Stackers (40)        | 20000.0000        | Tons       | 0.0011                           | Lbs/Ton     | 95.80          | 0.9240            | 0.2410                             |
| Screens (5)                     | 2500.0000         | Tons       | 0.0087                           | Lbs/Ton     | 91.50          | 1.8488            | 0.4821                             |
| Storage Bins (10)               | 5000.0000         | Tons       | 0.0011                           | Lbs/Ton     | 95.80          | 0.2310            | 0.0602                             |
| Truck Pit Loading               | 500.0000          | Tons       | 0.00002                          | Lbs/Ton     | 0.00           | 0.0080            | 0.0021                             |
| Truck Unloading to Crusher      | 500.0000          | Tons       | 0.00002                          | Lbs/Ton     | 0.00           | 0.0080            | 0.0021                             |
| Pit to Plant Haul Road          | 3.0303            | VMT        | 2.9521                           | Lbs/VMT     | 90.00          | 0.8946            | 0.2333                             |
| Plant to Storage Pile Haul Road | 4.1667            | VMT        | 3.4911                           | Lbs/VMT     | 90.00          | 1.4547            | 0.3794                             |
| Sales Haul Road                 | 3.0303            | VMT        | 2.4576                           | Lbs/VMT     | 90.00          | 0.7447            | 0.1942                             |
| Storage Pile Load In            | 500.0000          | Tons       | 0.0041                           | Lbs/Ton     | 0.00           | 2.0627            | 0.5379                             |
| Storage Pile Vehicular Activity | 500.0000          | Tons       | 0.0027                           | Lbs/VMT     | 90.00          | 0.1329            | 0.0347                             |
| Storage Piles Wind Erosion      | 3.0000            | Acres      | 0.0892                           | Lbs/Acre.Hr | 0.00           | 0.2675            | 0.0698                             |
| Storage Pile Load Out           | 500.000           | Tons       | 0.0041                           | Lbs/Ton     | 0.00           | 2.0627            | 0.5379                             |
| Engine 5589 – 5.48 MMBTU/hr     | 0.0525            | Mgal       | 7.85                             | Lbs/Mgal    | 0.00           | 0.4123            | 0.1075                             |
| Engine 5593 – 2.73 MMBTU/hr     | 0.0527            | Mgal       | 7.85                             | Lbs/Mgal    | 0.00           | 0.4139            | 0.1079                             |

<sup>1</sup> Maximum Hourly Design Rate (MHDR)

<sup>2</sup> Emission Factor (EF)

<sup>3</sup> The Modeling Rate is the emission rate scaled to the daily hours of operation at MHDR allow by the permit.