Montana Department of
ENVIRONMENTAL QUALITY
Brian Schweitzer, Governor
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June 9, 2011

Mr. Cale Fisher
Riverside Contracting, Inc.
5571 Alloy South
Missoula, MT 59808

Dear Mr. Fisher:

Montana Air Quality Permit #4630-01 is deemed final as of June 9, 2011, by the Department of Environmental Quality (Department). This permit is for a portable drum mix asphalt plant. 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

Deanne Fischer, P.E.
Environmental Engineer
Air Resources Management Bureau
(406) 444-3403

VW:DF
Enclosure

Montana Department of Environmental Quality
Permitting and Compliance Division

Montana Air Quality Permit #4630-01

Riverside Contracting, Inc.
5571 Alloy South
Missoula, MT 59808

June 9, 2011

MONTANA AIR QUALITY PERMIT

Issued To: Riverside Contracting, Inc.
5571 Alloy South
Missoula, MT 59808

MAQP: #4630-01
Administrative Amendment (AA) Request
Received: 04/18/2011
Department's Decision on AA: 05/24/2011
Permit Final: 06/09/2011
AFS #:777-4630

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

SECTION I: Permitted Facilities

A. Plant Location

Riverside Contracting operates a portable drum mix asphalt plant. The legal description of the facility's home pit is Section 27, Township 1 North, Range 27 East, in Yellowstone County, Montana. However, MAQP #4630-01 applies while operating at any location in Montana, except those areas having a Department of Environmental Quality (Department)-approved permitting program, areas considered tribal lands, or areas in or within 10 kilometers (km) of certain particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) nonattainment areas. *A Missoula County air quality permit will be required for locations within Missoula County, Montana*. An addendum will be required for locations in or within 10 km of certain PM_{10} nonattainment areas.

Addendum #2 will apply to the Riverside Contracting facility while operating at any location in or within 10 km of certain PM_{10} nonattainment areas during the summer months (April 1 – September 30) and at sites approved by the Department during the winter months (October 1 – March 31).

B. Current Permit Action

On April 18, 2011, the Department received a request from Riverside Contracting for an administrative amendment (AA) to MAQP#4630-00. Specifically, Riverside Contracting requested the addition of a 274 brake horsepower (bhp) diesel fueled engine/generator. The addition of the engine/generator does not increase the facility's potential to emit by more than five tons per year of any pollutant. Therefore, the engine/generator is being added as a de minimis change in accordance with ARM 17.8.745. The current permit action is an AA that will add the engine/generator to the list of permitted equipment and update the permit to reflect current permit language and rule references used by the Department.

SECTION II: Conditions and Limitations

A. Emission Limitations

1. Asphalt plant particulate matter emissions shall be limited to 0.04 grains per dry standard cubic feet (gr/dscf) (ARM 17.8.340, ARM 17.8.752, and 40 CFR 60, Subpart I).

2. Riverside Contracting shall not cause or authorize to be discharged into the atmosphere from dryers; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler; systems for mixing hot mix asphalt; and the loading, transfer, and storage systems associated with emission control systems, any visible emissions that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.340 , ARM 17.8.752, and 40 CFR 60, Subpart I).

3. All visible emissions from any non- New Source Performance Standard (NSPS) affected equipment shall not exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

4. Riverside Contracting 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).

5. Riverside Contracting shall treat all unpaved portions of the haul roads, access roads, parking lots, or the general plant area with water and/or chemical dust suppressant, as necessary, to maintain compliance with the reasonable precautions limitation in Section II.A.4 (ARM 17.8.749 and ARM 17.8.752).

6. Riverside Contracting shall install, operate, and maintain a fabric-filter baghouse for particulate matter air pollution control on the lime additive silo exhaust (ARM 17.8.749 and ARM 17.8.752)

7. Riverside Contracting shall install, operate, and maintain a fabric-filter baghouse for particulate matter air pollution control on the asphalt drum mix dryer exhaust (ARM 17.8.749 and ARM 17.8.752)

8. A device to measure the pressure drop (magnehelic gauge, manometer, etc.) on the control devices (baghouses) must be installed and maintained. Pressure drop must be measured in inches of water. Temperature indicators at the control device inlets and outlets must be installed and maintained (ARM 17.8.749)

9. Riverside shall use only fuel oil as fuel for the asphalt heater (ARM 17.8.749).

10. Riverside shall use fuel oil, coal, propane, and/or wood pellets to fire the hot mix dryer (ARM 17.8.749).

11. Riverside Contracting shall not have on-site more than two diesel engines/generators. The combined maximum rated design capacity of the engines that drive the generators shall not exceed 1,748 bhp (ARM 17.8.749).

12. Riverside Contracting shall not operate more than two diesel engines/generators at one time (ARM 17.8.749).

13. The 1,474-bhp diesel engine/generator shall be compliant with EPA non-road compression-ignition engine Tier 2 (at minimum) emission standards for all pollutants for the same model year and maximum engine power (ARM 17.8.749).

14. The 274 bhp diesel engine/generator shall be compliant with EPA non-road compression-ignition engine Tier 3 (at minimum) emission standards for all pollutants for the same model year and maximum engine power (ARM 17.8.749)

15. The two engines/generators shall each be limited to 1,650 hours of operation during any rolling 12-month time period (ARM 17.8.749).

16. Operation of the asphalt plant shall not exceed 1,250 hours during any rolling 12-month time period (ARM 17.8.749).

17. Total asphalt plant production shall be limited to 500,000 tons during any rolling 12-month time period (ARM 17.8.749 and ARM 17.8.1204).

18. Once a stack test is performed, the asphalt production rate shall be limited to the average production rate during the last source test demonstrating compliance (ARM 17.8.749).

19. If the permitted equipment is used in conjunction with any other equipment owned or operated by Riverside Contracting, at the same site, production shall be limited to correspond with an emission level that does not exceed 250 tons during any rolling 12-month period. Any calculations used to establish production levels shall be approved by the Department (ARM 17.8.749).

20. Riverside Contracting shall comply with all applicable standards and limitations, monitoring, reporting, recordkeeping, testing, and notification requirements contained in 40 CFR 60, Subpart I, *Standards of Performance for Hot Mix Asphalt Facilities* (ARM 17.8.340 and 40 CFR 60, Subpart I).

21. Riverside Contracting shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements contained in 40 CFR 60, Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines* 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 IIII; ARM 17.8.342 and 40 CFR 63, Subpart ZZZZ).

B. Testing Requirements

1. Within 60 days after achieving maximum production, but no later than 180 days after initial start-up, an Environmental Protection Agency (EPA) Methods 1-5 source test shall be performed on the asphalt drum mix dryer exhaust stack to demonstrate compliance with Section II.A.1. An EPA Method 9 opacity test and/or other methods and procedures as specified in 40 CFR 60.675 must be performed on all NSPS-affected equipment to demonstrate compliance with the emission limitations contained in Section II.A.2 Testing shall continue on an every 4-year basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105, ARM 17.8.340, ARM 17.8.749, and 40 CFR 60 Subpart I).

2. Since asphalt production will be limited to the average production rate during the compliance source test, it is suggested that the test be performed at the highest practical production rate (ARM 17.8.749).

3. Temperature and pressure drop across the pollution control device must be recorded daily and kept on site according to Section II.C.4 (ARM 17.8.749).

4. Temperature and pressure drop across the pollution control device must be recorded during the compliance source test and reported as part of the test results (ARM 17.8.749).

5. Riverside Contracting may retest at any time in order to test at a higher production rate (ARM 17.8.749).

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

7. The Department may require further testing (ARM 17.8.105).

C. Operational Recordkeeping and Reporting Requirements

1. If this portable asphalt plant is moved to another location, an Intent to Transfer form must be sent to the Department and a Public Notice Form for Change of Location must be published in a newspaper of general circulation in the area to which the transfer is to be made, at least 15 days prior to the move. The proof of publication (affidavit) of the Public Notice Form for Change of Location must be submitted to the Department prior to the move. These forms are available from the Department (ARM 17.8.749 and ARM 17.8.765).

2. Riverside Contracting 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 not be limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

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

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

4. Riverside Contracting shall maintain on-site records showing daily hours of operation and daily production rates for the last 12 months. The records compiled in accordance with this permit shall be maintained by Riverside Contracting as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

5. Riverside Contracting shall document, by month, the hours of operation of the diesel engines/generators. By the 25th day of each month, Riverside Contracting shall calculate the hours of operation of the diesel engines/generators for the previous month. The monthly information will be used to demonstrate compliance with the rolling 12-month limitation in Section II.A.15. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

6. Riverside Contracting shall document, by month, the asphalt production from the facility. By the 25th day of each month, Riverside Contracting shall calculate the asphalt production, from the facility for the previous month, and calculate and record the 12-month rolling sum. The monthly information will be used to demonstrate compliance with the rolling 12-month limitation in Section II.A.17. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

7. Riverside Contracting shall annually certify that its emissions are less than those that would require the facility to obtain an air quality operating permit as required by ARM 17.8.1204(3)(b). The annual certification shall comply with the certification requirements of ARM 17.8.1207. The annual certification shall be submitted along with the annual emissions inventory information (ARM 17.8.749 and ARM 17.8.1204).

D. Notification

1. Within 30 days of commencement of construction of any NSPS-affected equipment, Riverside Contracting shall notify the Department of the date of commencement of construction of the affected equipment (ARM 17.8.340 and 40 CFR 60, Subpart A and Subpart I).

2. Within 15 days of the actual start-up date of any NSPS-affected equipment, Riverside Contracting shall submit written notification to the Department of the initial start-up date of the affected equipment (ARM 17.8.340 and 40 CFR 60, Subpart A and Subpart I).

3. Within 15 days of the actual start-up date of any non-NSPS-affected equipment, Riverside Contracting shall submit written notification to the Department of the initial start-up date of the affected equipment (ARM 17.8.749).

E. Addendum

Riverside Contracting shall comply with all conditions in Addendum 2 to MAQP #4630-01 as applicable (ARM 17.8.749).

SECTION III: General Conditions

A. Inspection – Riverside Contracting shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (continuous emissions monitoring system (CEMS), continuous emissions rate monitoring system (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 Riverside Contracting fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Riverside Contracting of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided for 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. Air Quality Operation Fees – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by Riverside Contracting may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

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

I. The Department may modify the conditions of this permit based on local conditions of any future site. These factors may include, but are not limited to, local terrain, meteorological conditions, proximity to residences, etc.

J. Riverside Contracting shall comply with the conditions contained in this permit while operating in any location in Montana, except within those areas that have a Department-approved permitting program or areas considered tribal lands.

Montana Air Quality Permit (MAQP) Analysis
Riverside Contracting, Inc
MAQP #4630-01

I. Introduction/Process Description

Riverside Contracting, Inc. (Riverside Contracting) owns and operates a portable drum mix asphalt plant with a maximum rated design capacity of 400 tons per hour (TPH) powered by a 1,474 brake horsepower (bhp) diesel engine/generator and a 274 bhp diesel engine/generator.

A. Permitted Equipment

1. A portable drum mix asphalt plant and associated equipment with a maximum production capacity of 400 TPH utilizing a fuel oil/coal/propane/wood pellet-fired burner in the asphalt dryer.

2. One diesel-fired engine/generator with a maximum capacity of up to 1,474 bhp.

3. One diesel-fired engine/generator with a maximum capacity of up to 274 bhp.

B. Source Description

For a typical operational set-up, process materials are delivered to the plant site by truck, or crushed on site. Aggregates are stockpiled by size. The cold feed bins are charged as required from respective stockpiles, usually by a front end loader. The cold aggregate is transported on the gathering conveyor to the scalping screen to remove oversized and foreign material. The aggregates are then transported by belt conveyor to the pug mill in which any additives or other aggregates can be mixed. Any required mineral additives, stored in the mineral filler silo, can be added via screw conveyor to the pug mill. The aggregate is conveyed from the pug mill to the double drum mixer where it is heated and dried in the inner drum by the heat released from the controlled combustion of fuel in the burner. The burner at the Riverside Contracting plant may be fueled by fuel oil, coal, propane, or wood pellets or a combination thereof and exhausts through the primary bag house. Liquid asphalt is pumped from delivery tankers into the asphalt cement storage tanks where it is maintained at approximately 300 degrees Fahrenheit by the hot oil heater. Asphalt cement is pumped into the outer drum mixer by a metering unit. The heated aggregate leaves the inner drum and enters the outer drum passing through the mixing zone where the asphalt cement is pumped. The hot mix asphalt is discharged onto the elevating drag conveyor which transports it into the mix storage silo(s) to await truck load out. The hot mix asphalt is normally delivered into transport vehicles from the storage silo at a temperature of 270 to 300 degrees Fahrenheit.

A portion of the paving mixture may be recovered asphalt product (RAP). RAP is stockpiled in storage bins separately on site. When it is included in the mix formula, it is metered from its bin and transported on a gathering conveyor to a scalping screen. The RAP is transported on a belt conveyor to the drum mixer RAP inlet. The RAP mixes with the hot aggregate in the outer drum prior to passing through the mixing zone where the asphalt cement is pumped.

C. Permit History

On January 31, 2011, Riverside Contracting submitted a complete permit application to operate a portable drum mix asphalt plant and associated equipment with a maximum production capacity of 400 TPH utilizing a fuel oil/coal/propane/wood pellet-fired burner in the asphalt dryer. The plant would be powered by a maximum 1,474 bhp diesel-fired engine/generator. In addition, Riverside Contracting also requested an addendum to operate in or within 10 kilometers (km) of certain particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) nonattainment areas. The application was assigned **MAQP #4630-00** and **Addendum 1** was established. The facility's home pit is located in Section 27, Township 1 North, Range 27 East, in Yellowstone County, Montana.

D. Current Permit Action

On April 18, 2011, the Department received a request from Riverside Contracting to amend MAQP#4630-00 to include a second diesel-fired engine/generator with a maximum rated capacity of 274 bhp. The addition of the 274 bhp engine/generator does not increase the facility's potential to emit by more than five tons per year of any pollutant. Therefore, the diesel generator is being added as a de minimis change in accordance with ARM 17.8.745. The current permit action is an Administrative Amendment (AA) that adds the 274 bhp engine/generator to the list of emitting units and updates the permit to reflect current rule references, permit language, permit format, and emission factors. **MAQP#4630-01** replaces MAQP#4630-00 and **Addendum 2** replaces Addendum 1.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) 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 facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

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

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

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

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

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

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

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

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

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 Particulate Matter with an Aerodynamic Diameter of 10 Microns or Less (PM_{10})
11. ARM 17.8.230 Fluoride in Forage

Riverside Contracting must maintain compliance with the applicable ambient air quality standards.

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

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

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

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause or authorize to be discharged into the atmosphere 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 Process. This rule requires that no person shall cause or authorize to be discharged into the atmosphere particulate matter in excess of the amount set forth in this section.

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

6. ARM 17.8.340 Standard of Performance for New Stationary Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). Riverside Contracting is considered an NSPS affected facility under 40 CFR Part 60 and is subject to the requirements of the following subparts.

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

   b. 40 CFR 60, Subpart I – Standards of Performance for Hot Mix Asphalt Facilities. In order for an asphalt plant to be subject to this subpart, the facility must meet the definition of an affected facility and, the affected equipment must have been constructed, reconstructed, or modified after August 31, 1983. Based on the information submitted by Riverside Contracting, the asphalt plant equipment to be used under MAQP #4630-01 is subject to this subpart because the facility is a hot mix asphalt facility.

   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. This rule incorporates, by reference, 40 CFR Part 89, Control of Emissions from New and In-Use Non-road Compression-Ignition Engines which applies to engines greater than 560 kW and manufactured on or after January 1, 2000. Based on the information submitted by Riverside Contracting, the engine driving the electric generator is an EPA certified Tier 2 engine was certified in 2007 and is greater than 560 kW. Since this permit is written in a de minimis friendly manner, the CI ICE equipment to be used under MAQP #4630-01 may be subject to this subpart.

7. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This rule incorporates, by reference, 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Source Categories. Riverside Contracting is considered an NESHAP-affected facility under 40 CFR Part 63 and is subject to the requirements of the following subparts.

   a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to a NESHAPs Subpart as listed below.

b. 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants (HAPs) for Stationary Reciprocating Internal Combustion Engines (RICE). An owner or operator of a stationary reciprocating internal combustion engine (RICE) at a major or area source of HAP emissions is subject to this rule except if the stationary RICE is being tested at a stationary RICE test cell/stand. An area source of HAP emissions is a source that is not a major source. Based on the information submitted by Riverside Contracting, the RICE equipment to be used under MAQP #4630-01 is subject to this subpart because the facility is an area source of HAP emissions.

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 the permit action 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.

   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 asphalt plant, crusher or screen that has the potential to emit (PTE) greater than 15 tons per year of any pollutant. Riverside Contracting has a PTE greater than 15 tons per year of PM, PM_{10}, PM with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC); therefore, an air quality permit is required.

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

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

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. A permit application was not required for the current permit action because the permit change is considered an administrative permit change. (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. Although 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, Riverside Contracting submitted an affidavit of publication of public notice for the April 10, 2011, issue of the *Billings Gazette*, a newspaper of general circulation in the town of Billings in Yellowstone County.

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

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

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

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

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

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

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

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond

permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. (1) This rule states that an MAQP may be transferred from one location to another if the Department receives a complete notice of intent to transfer location, the facility will operate in the new location for less than 1 year, the facility will comply with the FCAA and the Clean Air Act of Montana, and the facility complies with other applicable rules. (2) 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 Modification--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source because it is not a listed source and the facility's PTE is less than 250 tons per year of any pollutant (excluding fugitive emissions).

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

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

a. PTE > 100 tons/year of any pollutant;

b. PTE > 10 tons/year of any one hazardous air pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program Applicability. (1) Title V of the FCAA Amendments of 1990 requires that all sources, as defined in ARM 17.8.1204 (1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #4630-01 for Riverside Contracting, the following conclusions were made:

a. The facility's PTE is less than 100 tons/year for any pollutant.

b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 TPY of all HAPs.

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

d. This facility is subject to a current NSPS. (40 CFR 60, Subpart I – Standards of Performance for Hot Mix Asphalt Plants applies to this facility and 40 CFR 60, Subpart IIII – Standards of Performance for CI ICE may apply to this facility)

e. This facility is subject to current NESHAP standards. (40 CFR 63, Subpart ZZZZ – NESHAP for Stationary RICE applies to this facility)

f. This source is not a Title IV affected source

g. This source is not a solid waste combustion unit.

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

Riverside Contracting requested hourly limitations to reduce emissions below modeling thresholds. Based on these limitations, the Department determined that this facility is not subject to the Title V Operating Permit Program. However, in the event that the EPA makes minor sources that are subject to NSPS obtain a Title V Operating Permit, this source will be subject to the Title V Operating Permit Program.

III. BACT Determination

A BACT determination is required for each new or modified source. Riverside Contracting 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

ANNUAL		
Maximum Process Rate:	400	tons/hr
Maximum Hours of Operation (Asphalt Plant):	1,250	hrs/yr
Maximum Hours of Operation (Diesel Engines/generators):	1,650	hrs/yr
Maximum Output (400 TPH x 1250 hr) :	500,000	tons/yr

Emission Source **	**PM**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**SO_2**
Cold Aggregate Storage Piles	0.83	0.39	0.06	--	--	--	--
Cold Aggregate Handling/Conveyors (2 transfers)	0.75	0.28	--	--	--	--	--
Cold Aggregate Screen	37.50	9.00	--	--	--	--	--
Diesel-Fired Asphalt Oil Heater	--	--		--	0.017	--	--
400 TPH Drum Mix Asphalt Dryer (Coal fueled)	13.88	9.36	6.75	13.75	32.50	8.00	47.50
Asphalt Surge Bin (silo) Filling	0.11	0.11	0.11	--	0.14	1.35	--
Lime Silo	0.18	0.09	0.06				
Plant Load-Out	0.09	0.09	0.09	--	0.16	0.46	--
Haul Roads / Vehicle Traffic	0.81	0.22	0.02	--	--	--	--
1,474 hp Diesel Engine/Generator	0.89	0.89	0.89	17.38	5.79	3.06	2.49
Total Emissions	**55.04**	**20.44**	**7.97**	**31.13**	**38.61**	**12.87**	**49.99**
274 hp Diesel Engine/Generator	0.20	0.20	0.20	2.46	1.30	0.57	0.46

1. All PM values include filterable and condensable fractions. Filterable fractions are based on NSPS limit of 0.04 gr/dscf. Condensable fractions are based on AP-42 data.
2. Inventory reflects enforceable limits on hours of operation for the asphalt plant to 1250 hrs/day to keep NOx emissions at or below the modeling threshold of 40 TPY and SO_2 at or below the modeling threshold of 50 TPY while burning either fuel oil, coal, propane, or wood pellets in drum mix dryer. The hours of operation for the diesel engines/generators were limited to 1,650 hrs to keep SO_2 at or below the modeling level of 50 TPY.
3. Emission factors for conveyors, screening, and transfers include water spray control (=50% reduction, DEQ memo, 5/3/99 and AP42, Table 11.19.2-2, note b.)
4. Emission factors for piles based on the conditions assumed in the predictive equation without additional water spray control (AP42, 13.2.4.)
5. When using coal as fuel for the dryer and limiting the hours of operation to 1,250 hr/yr, estimated SO_2 emissions = 47.5 TPY for a total of 49.99 TPY SO_2 for the plant.
6. Assumed emissions from burning propane or wood pellet fuel to be less than or equal to emissions produced by burning coal in the dryer.

**

acfm = actual cubic feet per minute
in. Hg = inches of mercury
C = Celsius
CO = carbon monoxide
dscfm = dry standard cubic feet per minute
F = Fahrenheit
gal = gallon
HAPs = hazardous air pollutants
hp = horsepower
hr = hour
lb = pound
N/A = not applicable
ND = no data available
NO_X = oxides of nitrogen
PM = particulate matter
PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less
$PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 microns or less
R = Rankine
SO_X = oxides of sulfur
TPH = tons per hour
TPY = tons per year
VOC = volatile organic compounds
yr = year

Cold Aggregate Storage Piles

PM Emissions:

Predictive equation for emission factor provided per **AP 42, Sec. 13.2.4.3, 11/06.**
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00331 lb/ton
Where: k = particle size multiplier = 0.74 (Value for PM < 30 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 10 mph (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
M = material moisture content = 3% (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
Control Efficiency = 0% (Water or chemical spray)
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.00331 lb/ton) * (ton/2000 lb) * (1 pile) = 0.83 ton/yr (Annual)
Note: Based on the conditions assumed in the predictive equation without additional water spray control.

PM_{10} Emissions:

Predictive equation for emission factor provided per **AP 42, Sec. 13.2.4.3, 11/06**.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00156 lb/ton
Where: k = particle size multiplier = 0.35 (Value for PM < 10 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 10 mph (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
M = material moisture content = 3% (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
Control Efficiency = 0% (Water or chemical spray)
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.00156 lb/ton) * (ton/2000 lb) * (1 pile) = 0.39 ton/yr (Annual)
Note: Based on the conditions assumed in the predictive equation without additional water spray control.

Filterable $PM_{2.5}$ Emissions:

Predictive equation for emission factor provided per **AP 42, Sec. 13.2.4.3, 11/06**.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00024 lb/ton
Where: k = particle size multiplier = 0.053 (Value for PM < 2.5 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 10 mph (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
M = material moisture content = 3% (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
Control Efficiency = 0% (Water or chemical spray)
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.00024 lb/ton) * (ton/2000 lb) * (1 pile) = 0.06 ton/yr (Annual)
Note: Based on the conditions assumed in the predictive equation without additional water spray control.

Conveyor Transfer Point (SCC 3-05-020-06)

Number of Transfers = 2 transfers (Company Information, based on schematic submitted with application)

Total PM Emissions:

Emission Factor = 0.003 lb/ton (0.0030 uncontrolled, 0.00014 controlled, AP 42, Table 11.19.2-2, 8/04)
Control Efficiency = 50% (Dept Guidance 4/8/93)
Calculation: (400 ton/hr) * (1250 hrs/yr) * (2 transfers) * (ton/2000 lb) * (0.003 lb/ton) =1.50 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (2 transfers) * (ton/2000 lb) * (0.003 lb/ton) * (1 - 50/100) = 0.75 ton/yr
Note: Based on uncontrolled emissions factors with 50% reduction for water spray, AP42, Table 11.19.2-2, note b.

Total PM_{10} Emissions:

Emission Factor = 0.0011 lb/ton (0.00110 uncontrolled, 0.000046 controlled, AP 42, Table 11.19.2-2, 8/04)
Control Efficiency = 50%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (3 lbs/day) * (ton/2000 lb) * (0.003 lb/ton) =0.55 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (2 transfers) * (ton/2000 lb) * (0.0011 lb/ton) * (1 - 50/100) = 0.28 ton/yr
Note: Based on uncontrolled emissions factors with 50% reduction for water spray, AP42, Table 11.19.2-2, note b.

Fines Screening (SCC 3-05-020-21)

Number of Screens = 1 screen (Company Information, Excludes RAP screen)

Total PM Emissions:

Emission Factor = 0.3 lb/ton (0.30 uncontrolled, 0.0036 controlled, AP 42, Table 11.19.2-2, 8/04)
Control Efficiency = 50% (Dept Guidance 4/8/93)
Calculation: (400 ton/hr) * (1250 hrs/year) * (1 screen) * (ton/2000 lb) * (0.3 lb/ton) = 75.00 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/year) * (1 screen) * (ton/2000 lb) * (0.3 lb/ton) * (1 - 50/100) = 37.5 ton/yr
Note: Based on uncontrolled emissions factors with 50% reduction for water spray, AP42, Table 11.19.2-2, note b.

Total PM_{10} Emissions:

Emission Factor = 0.072 lb/ton
Control Efficiency = 50% (Dept Guidance 4/8/93)
Calculation: (400 ton/hr) * (1250 hrs/year) * (1 screen) * (ton/2000 lb) * (0.072 lb/ton) = 18.00 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/year) * (1 screen) * (ton/2000 lb) * (0.072 lb/ton) * (1 - 50/100) = 9.0 ton/yr
Note: Based on uncontrolled emissions factors with 50% reduction for water spray, AP42, Table 11.19.2-2, note b.

Hot Oil Heater

Production Rate = 22.50 gal/hr (max. rated process rate. Company information)
Maximum Hours of Operation = 1,250 hrs/yr

CO Emissions:

Emission Factor = 0.0012 lb/gal (AP-42, Section 11.1, Table 11.1-13, No. 2 Fuel Oil, 3/04)
Control Efficiency = 0%
Calculation: (1250 hrs/yr) * (22.50 gal/hr) * (0.0012 lb/gal) * (ton/2000 lb) = 0.02 ton/yr (Annual)

CO_2 Emissions:

Emission Factor = 28 lb/gal (AP-42, Section 11.1, Table 11.1-13, No. 2 Fuel Oil, 3/04)
Control Efficiency = 0%
Calculation: (1250 hrs/yr) * (22.50 gal/hr) * (28 lb/gal) * (ton/2000 lb) = 393.75 ton/yr (Annual)

Dryer, fabric filter (SCC 3-05-002-05, -55 to -63)

Operating Parameters:

Plant Elevation:	3200	ft.	avg elev of 7 (cities) counties listed in application
Actual Pressure:	26.72	in. Hg	Estimate
Standard Pressure:	29.92	in. Hg	
Actual Flowrate (V2):	76,638	acfm	(Company Information)
Standard Temp:	20	C	68 F = 528 R
Assumed Stack Temp.	146	C	295 F = 755 R

(avg of range submitted by applicant: 215-375° F)

Standard Volumetric Flowrate Correction: V1 = V2 (P2/P1) (T1/T2)

V1=76638 acfm * (26.72 in. Hg / 29.92 in. Hg) * (528 R / 755 R)

Corrected Flowrate (V1):	47,869	scfm	
Stack Gas Moisture Content (M):	12	%	(estimate)

=V1*(1 - M/100) = 47,869 scfm

Dry Standard Volumetric Flowrate: * (1 - 12/100)

Dry Standard Volumetric Flowrate: 42,125 dscfm

Dryer, fabric filter (SCC 3-05-002-05, -55 to -63) (Burning fuel oil)

Maximum Process Rate = 400 ton/hr (Application information)
Maximum Hours of Operation = 1,250 hrs/yr (Annual)
Dry Standard Volumetric Flowrate: 42,125 dscfm

Filterable PM Emissions:
Based on Emission Limit
Emission Factor = 0.04 gr/dscf (permit limit)
Calculation: (0.04 gr/dscf) * (42,125 dscfm) * (1 lb / 7000 gr) * (60 min/hr) = 14.44 lb/hr
Calculation: (14.44 lb/hr) * (1250 hrs/yr) * (0.0005 ton/lb) = 9.03 ton/yr

Filterable PM_{10} Emissions:
Based on Emission Limit
Emission Factor = 0.02 gr/dscf (permit limit, assuming 50% of TSP is PM10, Department policy)
Calculation: (0.02 gr/dscf) * (42,125 dscfm) * (1 lb / 7000 gr) * (60 min/hr) = 7.22 lb/hr
Calculation: (7.22 lb/hr) * (1250 hrs/yr) * (0.0005 ton/lb) = 4.51 ton/yr

Filterable $PM_{2.5}$ Emissions:
Based on Emission Limit
Emission Factor = 0.0084 gr/dscf (permit limit, assuming 21% of TSP is PM2.5, AP 42, Table 11.1-4, 3/04)
Calculation: (0.0084 gr/dscf) * (42,125 dscfm) * (1 lb / 7000 gr) * (60 min/hr) = 3.03 lb/hr
Calculation: (3.03 lb/hr) * (1250 hrs/yr) * (0.0005 ton/lb) = 1.90 ton/yr

Condensable $PM_{2.5}$ Emissions:
Based on AP-42
Emission Factor = 0.0194 lb/ton (fabric filter, AP 42, Table 11.1-3, 3/04, inorganic+organic)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.0194 lb/ton) * (ton/2000 lb) = 4.85 ton/yr (Annual)
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.0194 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 4.85 ton/yr (Annual)

CO Emissions:
Emission Factor = 0.13 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.13 lb/ton) * (ton/2000 lb) = 32.50 ton/yr (Annual)
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.13 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 32.50 ton/yr (Annual)

NOx Emissions:

Emission Factor = 0.055 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.055 lb/ton) * (ton/2000 lb) = 13.75 ton/yr (Annual)
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.055 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 13.75 ton/yr (Annual)

SO_2 Emissions:
Emission Factor = 0.011 lb/ton (0.011 lb/ton #2 fuel oil, 0.19 lb/ton coal, AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.011 lb/ton) * (ton/2000 lb) = 2.75 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.011 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 2.75 ton/yr

TOC Emissions:
Emission Factor = 0.044 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-8, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.044 lb/ton) * (ton/2000 lb) = 11.00 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.044 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 11.00 ton/yr

CH_4 Emissions:
Emission Factor = 0.012 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-8, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.012 lb/ton) * (ton/2000 lb) = 3.00 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.012 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 3.00 ton/yr
CO2e = 3.00 * 21 = 63.00 ton/yr

VOC Emissions:
Emission Factor = 0.032 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-8, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.032 lb/ton) * (ton/2000 lb) = 8.00 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.032 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 8.00 ton/yr

Total HAPs Emissions:
Emission Factor = 0.0087 lb/ton (#2 fuel oil-fired dryer with fabric filter, AP 42, Table 11.1-10, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.0087 lb/ton) * (ton/2000 lb) = 2.18 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.0087 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 2.18 ton/yr

CO_2 Emissions:
Emission Factor = 33 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (33 lb/ton) * (ton/2000 lb) = 8,250.00 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (33 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 8,250.00 ton/yr

Dryer, fabric filter (SCC 3-05-002-05, -55 to -63) (Burning Coal as fuel)

Maximum Process Rate = 400 ton/hr (Application information)
Maximum Hours of Operation = 1,250 hrs/yr (Annual)
Dry Standard Volumetric Flowrate: 42,125 dscfm

Filterable PM Emissions:
Based on Emission Limit
Emission Factor = 0.04 gr/dscf (permit limit)
Calculation: (0.04 gr/dscf) * (42,125 dscfm) * (1 lb / 7000 gr) * (60 min/hr) = 14.44 lb/hr
Calculation: (14.44 lb/hr) * (1250 hrs/yr) * (0.0005 ton/lb) = 9.03 ton/yr

Filterable PM_{10} Emissions:
Based on Emission Limit
Emission Factor = 0.02 gr/dscf (permit limit, assuming 50% of TSP is PM10, Department policy)
Calculation: (0.02 gr/dscf) * (42,125 dscfm) * (1 lb / 7000 gr) * (60 min/hr) = 7.22 lb/hr
Calculation: (7.22 lb/hr) * (1250 hrs/yr) * (0.0005 ton/lb) = 4.51 ton/yr

Filterable $PM_{2.5}$ Emissions:
Based on Emission Limit
Emission Factor = 0.0084 gr/dscf (permit limit, assuming 21% of TSP is PM2.5, AP 42, Table 11.1-4, 3/04)
Calculation: (0.0084 gr/dscf) * (42,125 dscfm) * (1 lb / 7000 gr) * (60 min/hr) = 3.03 lb/hr
Calculation: (3.03 lb/hr) * (1250 hrs/yr) * (0.0005 ton/lb) = 1.90 ton/yr

Condensable $PM_{2.5}$ Emissions:
Based on AP-42
Emission Factor = 0.0194 lb/ton (fabric filter, AP 42, Table 11.1-3, 3/04, inorganic+organic)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.0194 lb/ton) * (ton/2000 lb) = 4.85 ton/yr (Annual)
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.0194 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 4.85 ton/yr (Annual)

CO Emissions:
Emission Factor = 0.13 lb/ton (AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.13 lb/ton) * (ton/2000 lb) = 32.50 ton/yr (Annual)
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.13 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 32.50 ton/yr (Annual)

NOx Emissions:
Emission Factor = 0.055 lb/ton (AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.055 lb/ton) * (ton/2000 lb) = 13.75 ton/yr (Annual)
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.055 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 13.75 ton/yr (Annual)

SO_2 Emissions:
Emission Factor = 0.19 lb/ton (0.19 lb/ton coal, AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.19 lb/ton) * (ton/2000 lb) = 47.50 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.19 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 47.50 ton/yr

TOC Emissions:
Emission Factor = 0.044 lb/ton (AP 42, Table 11.1-8, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.044 lb/ton) * (ton/2000 lb) = 11.00 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.044 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 11.00 ton/yr

CH_4 Emissions:
Emission Factor = 0.012 lb/ton (AP 42, Table 11.1-8, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.012 lb/ton) * (ton/2000 lb) = 3.00 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.012 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 3.00 ton/yr
CO2e = 3.00 * 21 = 63.00 ton/yr

VOC Emissions:
Emission Factor = 0.032 lb/ton (AP 42, Table 11.1-8, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.032 lb/ton) * (ton/2000 lb) = 8.00 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.032 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 8.00 ton/yr

Total HAPs Emissions:
Emission Factor = 0.0087 lb/ton (dryer with fabric filter, AP 42, Table 11.1-10, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.0087 lb/ton) * (ton/2000 lb) = 2.18 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.0087 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 2.18 ton/yr

CO_2 Emissions:
Emission Factor = 33 lb/ton (AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (33 lb/ton) * (ton/2000 lb) = 8,250.00 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (33 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 8,250.00 ton/yr

Silo Filling (SCC 3-05-002-13)

Total PM Emissions: (Total PM is assumed to be predominantly PM-2.5 since emissions consist of condensed vapors; AP 42, Table 11.1-14. Therefore, this calculation assumes there are no filterable particulate emissions)

Emission Factor = 0.000332 + 0.00105(-V)e^((0.0251)(T + 460) - 20.43) = 0.00045 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (avg of range submitted by applicant: 215-375^0 F)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hr/year) * (0.00045 lb/ton) * (ton/2000 lb) = 0.11 TPY

Organic PM Emissions : (if organic particulate needs to be calculated)
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.00105(-V)e^((0.0251)(T + 460) - 20.43) = 0.00012 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (avg of range submitted by applicant: 215-375^0 F)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hr/year) * (0.00012 lb/ton) * (ton/2000 lb) = 0.03 TPY

VOC Emissions: (VOC = TOC * 94%, AP-42, Table 11.1-16, 3/04)
Predictive equation for TOC emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.0504(-V)e^((0.0251)(T + 460) - 20.43) * (94%) = 0.00539 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (avg of range submitted by applicant: 215-375^0 F)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hr/year) * (0.00539 lb/ton) * (ton/2000 lb) = 1.35 TPY

CO Emissions:
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.00488(-V)e^((0.0251)(T + 460) - 20.43) = 0.00056 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (avg of range submitted by applicant: 215-375^0 F)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hr/year) * (0.00056 lb/ton) * (ton/2000 lb) = 0.14 TPY

CH4 Emissions:(CH4 = TOC *0.26%, AP-42, Table 11.1-16, 3/04)
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.

Emission Factor = 0.0172(-V)e^((0.0251)(T + 460) - 20.43) *0.26% = 0.00001 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hr/year) * (0.00001 lb/ton) * (ton/2000 lb) = 0.00 ton/yr
CO2e = 0.0013 * 21 = 0.0267 ton/yr

Plant Load-Out (SCC 3-05-002-14)

Total PM Emissions: (Total PM is assumed to be predominantly PM-2.5 since emissions consist of condensed vapors; AP 42, Table 11.1-14. Therefore, this calculation assumes there are no filterable particulate emissions)

Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.000181 + 0.00141(-V)e^((0.0251)(T + 460) - 20.43) = 0.00034 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.00034 lb/ton) * (ton/2000 lb) = 0.09 ton/yr

Organic $PM_{2.5}$ Emissions:
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.00141(-V)e^((0.0251)(T + 460) - 20.43) = 0.00016 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.00016 lb/ton) * (ton/2000 lb) = 0.04 ton/yr

VOC Emissions: (VOC = TOC * 94%, AP-42, Table 11.1-16, 3/04)
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.0172(-V)e^((0.0251)(T + 460) - 20.43) * 94% = 0.00184 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.00184 lb/ton) * (ton/2000 lb) = 0.46 ton/yr

CH_4 Emissions:(CH4 = TOC * 6.5%, AP-42, Table 11.1-16, 3/04)
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.0172(-V)e^((0.0251)(T + 460) - 20.43) * 6.5% = 0.00013 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.00013 lb/ton) * (ton/2000 lb) = 0.03 ton/yr
CO2e = 0.03 * 21 = 0.67 ton/yr

CO Emissions:
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.00558(-V)e^((0.0251)(T + 460) - 20.43) = 0.00064 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.00064 lb/ton) * (ton/2000 lb) = 0.16 ton/yr
Calculation: (400 ton/hr) * (1250 hrs/yr) * (0.00064 lb/ton) * (ton/2000 lb) * (1 - 0/100) = 0.16 ton/yr

Haul Roads

Vehicle Miles Traveled (VMT) per Day = 5 VMT/day (Estimate)
VMT per hour = (5 VMT/day) * (day/24 hrs) = 0.21 VMT/hr
Hours of Operation = 1,250 hrs/yr

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 = 12.46 lb/VMT
Where: k = constant = 4.9 lbs/VMT (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)

a = constant = 0.7 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (1250 hrs/yr) * (0.21 VMT/hr) * (12.46 lb/VMT) * (ton/2000 lb) = 1.62 tons/yr (Uncontrolled Emissions)
Calculation: (1250 hrs/yr) * (0.21 VMT/hr) * (12.46 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.81 tons/yr (Apply 50% control efficiency)

PM_{10} 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 = 3.43 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 = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)
a = constant = 0.9 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (1250 hrs/yr) * (0.21 VMT/hr) * (3.43 lb/VMT) * (ton/2000 lb) = 0.45 tons/yr (Uncontrolled Emissions)
Calculation: (1250 hrs/yr) * (0.21 VMT/hr) * (3.43 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.22 tons/yr (Apply 50% control efficiency)

$PM_{2.5}$ 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 = 0.34 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 = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)
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)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (1250 hrs/yr) * (0.21 VMT/hr) * (0.34 lb/VMT) * (ton/2000 lb) = 0.04 tons/yr (Uncontrolled Emissions)
Calculation: (1250 hrs/yr) * (0.21 VMT/hr) * (0.34 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.02 tons/yr (Apply 50% control efficiency)

Diesel Engine/Generator (1,474 bhp)
Operational Capacity of Engine = 1,474 hp
Hours of Operation = 1,650 hours

Total $PM/PM_{10}/PM_{2.5}$ Emissions:
Emission Factor = 1.08 lbs/hr (EPA Tier 2- FEL, 40CFR89 subpart B, Table 2, 0.54 g/kw-hr)
Calculation: (1,650 hours) * (1.08335154564 lbs/hr) * (ton/2000 lb) = 0.89 ton/yr

NOx Emissions:
Emission Factor = 21.07 lbs/hr (EPA Tier 2- FEL, 40CFR89 subpart B, Table 2, 10.5 g/kw-hr)
Calculation: (1,650 hours) * (21.07 lbs/hr) * (ton/2000 lb) = 17.38 ton/yr

CO Emissions:
Emission Factor = 7.02 lbs/hr (EPA Tier 2, 40CFR89 subpart B, Table 1, 3.5 g/kw-hr)
Calculation: (1,650 hours) * (7.021722981 lbs/hr) * (ton/2000 lb) = 5.79 ton/yr

VOC Emissions:
Emission Factor = 0.0025 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)
Calculation: (1,650 hours) * (1,474 hp) * (0.0025141 lbs/hp-hr) * (ton/2000 lb) = 3.06 ton/yr

SOx Emissions:
Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (1,650 hours) * (1,474 hp) * (0.00205 lbs/hp-hr) * (ton/2000 lb) = 2.49 ton/yr

CO_2 Emissions:
Emission Factor = 1.15 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (1,650 hours) * (1,474 hp) * (1.15 lbs/hp-hr) * (ton/2000 lb) = 1,398.46 ton/yr

Diesel Engine/Generator (274 bhp)

Operational Capacity of Engine = 274 hp
Hours of Operation = 1,650 hours

Total $PM/PM_{10}/PM_{2.5}$ Emissions:
Emission Factor = 0.244 lbs/hr (EPA Tier 2- FEL, 40CFR89 subpart B, Table 2, 0.54 g/kw-hr)
Calculation: (1,650 hours) * (0.244 lbs/hr) * (ton/2000 lb) = 0.20 ton/yr

NOx Emissions:
Emission Factor = 2.98 lbs/hr (EPA Tier 2- FEL, 40CFR89 subpart B, Table 2, 6.6 g/kw-hr)
Calculation: (1,650 hours) * (2.98 lbs/hr) * (ton/2000 lb) = 2.46 ton/yr

CO Emissions:
Emission Factor = 1.58 lbs/hr (EPA Tier 2, 40CFR89 subpart B, Table 1, 3.5 g/kw-hr)
Calculation: (1,650 hours) * (1.58 lbs/hr) * (ton/2000 lb) = 1.3 ton/yr

VOC Emissions:
Emission Factor = 0.0025 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)
Calculation: (1,650 hours) * (274 hp) * (0.0025141 lbs/hp-hr) * (ton/2000 lb) = 0.57 ton/yr

SOx Emissions:
Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (1,650 hours) * (274 hp) * (0.00205 lbs/hp-hr) * (ton/2000 lb) = 0.46 ton/yr

CO_2 Emissions:
Emission Factor = 1.15 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (1,650 hours) * (274 hp) * (1.15 lbs/hp-hr) * (ton/2000 lb) = 259.96 ton/yr

Lime Silo

Operating Parameters:

Plant Elevation:	4200	ft. avg elev of 5 (cities) counties listed in application				
Actual Pressure:	25.72	in. Hg Estimate				
Standard Pressure:	29.92	in. Hg				
Actual Flowrate (V2):	1,000	acfm (similar sized facility)				
Standard Temp:	20	C	68	F	528	R
Assumed Stack Temp.	68	F	68	F	528	R
						assume ambient temp

Standard Volumetric Flowrate Correction: V1 = V2 (P2/P1) (T1/T2)
V1=1000 * (25.7241958041958 / 29.92) * (528 R / 528 R)

Corrected Flowrate (V1):	860	scfm	
Stack Gas Moisture Content (M):	0	%	(estimate)

Dry Standard Volumetric Flowrate: =V1*(1 - M/100) = 860 scfm * (1 - 0/100)
Dry Standard Volumetric Flowrate: 860 dscfm

Lime Silo

Flow Capacity = 860 cfm (similar sized facility)	860	cfm
Maximum Hours of Operation = 16 hrs/day (Summer Hours)	16	hrs/day

Total PM Emissions:

Emission Factor = 0.04 gr/dscf (Permit limit per NSPS)	0.04	gr/dscf
Control Efficiency = 0%	0	%
Calculation: (860 cfm) * (1250 hrs/year) * (0.04 gr/dscf) * (lb/7000 gr) * (60 min/hr)*1/2000 =	**0.18**	Ton/year

Total PM_{10} Emissions:

Emission Factor = 0.02 gr/dscf Assume PM10 = 50% of PM, Department Policy	0.02	gr/dscf
Control Efficiency = 0%	0	%
Calculation: (860 cfm) * (1250 hrs/year) * (0.02 gr/dscf) * (lb/7000 gr) * (60 min/hr)*1/2000 =	**0.09**	Ton/year

Total $PM_{2.5}$ Emissions:

Emission Factor = 0.012 gr/dscf Assume PM2.5 = 30% of PM, AP-42, Appendix B-2, Category 4	0.012	gr/dscf
Control Efficiency = 0%	0	%
Calculation: (860 cfm) * (1250 hrs/year) * (0.012 gr/dscf) * (lb/7000 gr) * (60 min/hr)*1/2000 =	**0.06**	Ton/year

V. Air Quality Impacts

MAQP #4630-01 covers operation of this portable drum mix asphalt plant while operating in areas within Montana that are classified as being in attainment with federal ambient air quality standards and areas not yet classified, excluding counties that have a Department-approved permitting program and areas that are tribal lands. This permit contains conditions and limitations that would protect air quality for the site and surrounding area, and that would limit the facility's emissions below the major source threshold. Based on the information provided, the amount of controlled emissions generated by this facility will not exceed any ambient air quality standard.

VII. Ambient Air Impact Analysis

The Department determined that the impact from this permitting action will be minor. The Department believes that the facility will not cause or contribute to a violation of any ambient air quality standard.

VIII. 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.

IX. 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: Deanne Fischer
Date: May 3, 2011

Addendum 2
Riverside Contracting, Inc.
Montana Air Quality Permit (MAQP) #4630-01

An addendum to MAQP #4630-01 is hereby granted to Riverside Contracting, Inc. (Riverside Contracting) pursuant to Section 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.765, as amended, for the following:

I. Permitted Equipment:

Riverside Contracting owns and operates a portable drum mix asphalt plant and associated equipment with a maximum production capacity of 400 tons per hour (TPH), a diesel-fired engine/generator with a maximum capacity of up to 1,474 brake horsepower (bhp), and a diesel-fired engine/generator with a maximum capacity of up to 274 bhp. Particulate emissions from the drum mix asphalt plant are controlled by a pulse jet baghouse.

II. Seasonal and Site Restrictions – **Winter and Summer Seasons**

Addendum 2 applies to the Riverside Contracting facility while operating at any location in or within 10 kilometers (km) of certain particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) nonattainment areas. Additionally, seasonal and site restrictions apply to the facility as follows:

A. During the winter season (October 1-March 31) The only location in or within 10 km of a PM_{10} nonattainment area where Riverside Contracting may operate is:

1. Any site that may be approved, in writing, by the Department of Environmental Quality (Department).

B. During the summer season (April 1-September 30) – Riverside Contracting may operate at any location in or within 10 km of the Butte, Columbia Falls, Kalispell, Libby, Thompson Falls, and Whitefish PM_{10} nonattainment areas.

C. Riverside Contracting shall comply with the limitations and conditions contained in Addendum 2 to MAQP #4630-01 while operating in or within 10 km of any of the previously identified PM_{10} nonattainment areas. Addendum 2 shall be valid until revoked or modified. The Department reserves the authority to modify Addendum 2 at any time based on local conditions of any future site. These conditions may include, but are not limited to, local terrain, meteorological conditions, proximity to residences or other businesses, etc.

III. Limitations and Conditions

A. Operational Limitations and Conditions – Winter and Summer Season Conditions

1. Asphalt plant particulate matter emissions shall be limited to 0.04 grains per dry standard cubic feet (gr/dscf) (ARM 17.8.340, ARM 17.8.752, and 40 Code of Federal Regulations (CFR) 60, Subpart I).

2. Riverside Contracting shall not cause or authorize to be discharged into the atmosphere from the asphalt plant stack, any visible emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes (ARM 17.8.749).

3. Riverside Contracting shall not cause or authorize to be discharged into the atmosphere from any equipment, such as screens or transfer points, any visible emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes (ARM 17.8.749).

4. Riverside Contracting shall not cause or authorize to be discharged into the atmosphere from haul roads, access roads, parking lots, or the general plant property any visible fugitive emissions that exhibit an opacity of 10% or greater (ARM 17.8.749).

5. Riverside Contracting shall treat all unpaved portions of the access roads, parking lots, and general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the 10% opacity limitation (ARM 17.8.749).

6. Riverside Contracting shall not have on-site more than two diesel engines/generators. The combined maximum rated design capacity of the engines that drive the generators shall not exceed 1,748 bhp (ARM 17.8.749) .

7. Riverside Contracting shall not operate more than two diesel engine/generator at one time (ARM 17.8.749).

8. The 1,474-bhp diesel engine/generator shall be compliant with EPA non-road compression-ignition engine Tier 2 (at minimum) emission standards for all pollutants for the same model year and maximum engine power (ARM 17.8.749).

9. The 274 bhp diesel engine/generator shall be compliant with EPA non-road compression-ignition engine Tier 3 (at minimum) emission standards for all pollutants for the same model year and maximum engine power (ARM 17.8.749)

10. During the Summer Season operation of the asphalt plant while utilizing No.2 Fuel Oil, coal, propane, or wood pellets as the fuel source for the drum mix dryer, and including the diesel engines/generators shall not exceed 16 hours per day and asphalt production shall not exceed 6,400 tons per day (ARM 17.8.749).

11. During the Winter Season operation of the asphalt plant while utilizing No.2 Fuel Oil, coal, propane, or wood pellets as the fuel source for the drum mix dryer, and including the diesel engines/generators shall not exceed 2.5 hours per day and asphalt production shall not exceed 1,000 tons per day(ARM 17.8.749).

B. Operational Reporting Requirements

1. If this portable asphalt plant is moved to another nonattainment location, an Intent to Transfer form must be sent to the Department and a Public Notice Form for Change of Location must be published in a newspaper of general circulation in the area to which the transfer is to be made, at least 15 days prior to the move. The proof of publication (affidavit) of the Public Notice Form for Change of Location must be submitted to the Department prior to the move. These forms are available from the Department (ARM 17.8.749 and ARM 17.8.765).

2. Production information for the sites covered by this addendum must be maintained for 5 years and submitted to the Department upon request. The information must include (ARM 17.8.749):

a. Tons of asphalt produced at each site,

b. Daily hours of operation at each site,

c. Hours of operation and sizes for the engines/generators at each site, and

d. Fugitive dust information consisting of the total miles driven on unpaved roads for all plant vehicles.

3. Riverside Contracting shall document, by day, the total asphalt production. Riverside Contracting shall sum the total asphalt production for the previous day to verify compliance with the limitations in Section III.A.10 for summer operation and Section III.A.11 for winter operation. A written report of compliance and the emissions inventory shall be submitted to the Department annually. The report for the previous calendar year shall be submitted and may be submitted along with the annual emissions inventory (ARM 17.8.749).

4. Riverside Contracting shall document, by day, the total hours of operation of the diesel engines/generators. Riverside Contracting shall sum the total hours of operation for the previous day to verify compliance with the limitation in III.A.10 for summer operation and Section III.A.11 for winter operation. A written report of compliance and the emissions inventory shall be submitted to the Department annually. The report for the previous calendar year shall be submitted and may be submitted along with the annual emissions inventory (ARM 17.8.749).

Addendum 2 Analysis
Riverside Contracting, Inc.
Montana Air Quality Permit (MAQP) #4630-01

I. Permitted Equipment

Riverside Contracting, Inc. (Riverside Contracting) owns and operates a portable drum mix asphalt plant and associated equipment with a maximum production capacity of 400 tons per hour (TPH), a diesel-fired engine/generator with a maximum capacity of up to 1,474 brake horsepower (bhp), and a diesel fired engine/generator with a maximum capacity of up to 274 bhp.

II. Source Description

Riverside Contracting uses this portable asphalt plant to produce asphalt for use in various construction operations. For a typical operational set-up, process materials are delivered to the plant site by truck, or crushed on site. Aggregates are stockpiled by size. The cold feed bins are charged as required from respective stockpiles, usually by a front end loader. The cold aggregate is transported on the gathering conveyor to the scalping screen to remove oversized and foreign material. The aggregates are then transported by belt conveyor to the pug mill in which any additives or other aggregates can be mixed. Any required mineral additives, stored in the mineral filler silo, can be added via screw conveyor to the pug mill. The aggregate is conveyed from the pug mill to the double drum mixer where it is heated and dried in the inner drum by the heat released from the controlled combustion of fuel in the burner. The burner at the Riverside Contracting plant may be fueled by fuel oil, coal, propane, or wood pellets or a combination thereof and exhausts through the primary bag house. Liquid asphalt is pumped from delivery tankers into the asphalt cement storage tanks where it is maintained at approximately 300 degrees Fahrenheit by the hot oil heater. Asphalt cement is pumped into the outer drum mixer by a metering unit. The heated aggregate leaves the inner drum and enters the outer drum passing through the mixing zone where the asphalt cement is pumped. The hot mix asphalt is discharged onto the elevating drag conveyor which transports it into the mix storage silo(s) to await truck load out. The hot mix asphalt is normally delivered into transport vehicles from the storage silo at a temperature of 270 to 300 degrees Fahrenheit.

A portion of the paving mixture may be recovered asphalt product (RAP). RAP is stockpiled in storage bins separately on site. When it is included in the mix formula, it is metered from its bin and transported on a gathering conveyor to a scalping screen. The RAP is transported on a belt conveyor to the drum mixer RAP inlet. The RAP mixes with the hot aggregate in the outer drum prior to passing through the mixing zone where the asphalt cement is pumped.

III. Applicable Rules and Regulations

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

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

A. ARM 17.8.749 Conditions for Issuance 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.

B. 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. A source may not increase its emissions beyond those found in its permit unless the source applies for and receives another permit.

C. ARM 17.8.765 Transfer of Permit. An air quality permit may be transferred from one location to another if:

1. Written notice of intent to transfer location and proof of public notice are sent to the Department;

2. The source will operate in the new location for a period of less than 1 year; and

3. The source will not have any significant impact on any nonattainment area or any Class I area.

IV. Emission Inventory – Summer and Winter Seasons

SUMMER (Hours of Operation Restricted to 16 hrs/day)	**lbs/day**						
Emission Source	**PM**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**SO_2**
Cold Aggregate Storage Piles	21.15	10.00	1.52	--	--	--	--
Cold Aggregate Handling/Conveyors (2 transfers)	19.20	7.04	--	--	--	--	--
Cold Aggregate Screen	960.00	230.40	--	--	--	--	--
Diesel-Fired Asphalt Oil Heater	--	--		--	0.4320	--	--
400 TPH Drum Mix Asphalt Dryer	355.25	239.70	67.93	352.00	832.00	204.80	70.40
Asphalt Surge Bin (silo) Filling	2.89	2.89	2.89	--	3.56	34.53	--
Lime Silo	4.72	2.36	1.42				
Plant Load-Out	2.19	2.19	2.19	--	4.07	11.78	--
Haul Roads / Vehicle Traffic	20.77	5.72	0.57	--	--	--	--
1,474 bhp Engine/Generator	17.33	17.33	17.33	337.12	112.35	59.29	48.35
Total Emissions	**1403.49**	**517.64**	**93.84**	**689.12**	**952.40**	**310.40**	**118.75**
274 bhp Engine/Generator	3.90	3.90	3.90	47.68	25.31	11.02	8.99

1. Hours of operation restricted to 16 hrs/day to keep PM10 emissions below 547 lbs/day day (PM10 emission assumed to be the same while burning fuel oil, coal, propane, or wood pellets).
2. Emission factors for screening, and transfers include water spray control (=50% reduction, DEQ memo, 5/3/99 and AP42, Table 11.19.2-2, note b.)
3. Emission factors for piles based on the conditions assumed in the predictive equation without additional water spray control (AP42, 13.2.4.4)

WINTER (Hours of Operation Restricted to 2.5 hrs/day)	lbs/day						
Emission Source	**PM**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**SO_2**
Cold Aggregate Storage Piles	3.31	1.56	0.24	--	--	--	--
Cold Aggregate Handling/Conveyors (2 transfers)	3.00	1.10	0.00	--	--	--	--
Cold Aggregate Screen	150.00	36.00	--	--	--	--	--
Diesel-Fired Asphalt Oil Heater	--	--		--	0.06750	--	--
400 TPH Drum Mix Asphalt Dryer	55.51	37.45	26.98	55.00	130.00	32.00	11.00
Asphalt Surge Bin (silo) Filling	0.45	0.45	0.45	--	0.56	5.39	--
Lime Silo	0.74	0.37	0.22				
Plant Load-Out	0.34	0.34	0.34	--	0.64	1.84	--
Haul Roads / Vehicle Traffic	3.24	0.89	0.09	--	--	--	--
1,474 bhp Engine/Generator	2.71	2.71	2.71	52.68	17.55	9.26	7.55
Total Emissions	**219.30**	**80.88**	**31.03**	**107.68**	**148.81**	**48.50**	**18.55**
274 bhp Engine/Generator	0.61	0.61	0.61	7.45	3.95	1.72	1.40

1. Hours of operation restricted to 2.5 hrs/day to keep PM10 emissions below 82 lbs/day (PM10 emission assumed to be the same while burning fuel oil, coal, propane, or wood pellets).
2. Emission factors for screening, and transfers include water spray control (=50% reduction, DEQ memo, 5/3/99 and AP42, Table 11.19.2-2, note b.)
3. Emission factors for piles based on the conditions assumed in the predictive equation without additional water spray control (AP42, 13.2.4.4)

**

acfm = actual cubic feet per minute
in. Hg = inches of mercury
C = Celsius
CO = carbon monoxide
dscfm = dry standard cubic feet per minute
F = Fahrenheit
gal = gallon
HAPs = hazardous air pollutants
hp = horsepower
hr = hour
lb = pound
N/A = not applicable
ND = no data available
NO_X = oxides of nitrogen
PM = particulate matter
PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less
$PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 microns or less
R = Rankine
SO_X = oxides of sulfur
TPH = tons per hour
TPY = tons per year
VOC = volatile organic compounds
yr = year

Cold Aggregate Storage Piles

Maximum Process Rate = 400 ton/hr (Maximum plant process rate)
Number of Piles = 1 pile
Maximum Hours of Operation = 16 hrs/day (summer hours)
Maximum Hours of Operation = 2.5 hrs/day (winter hours)

PM Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00331 lb/ton
Where: k = particle size multiplier = 0.74 (Value for PM < 30 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 10 mph (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
M = material moisture content = 3% (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
Control Efficiency = 0% (Water or chemical spray)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00331 lb/ton) * (1 pile) = 21.15 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00331 lb/ton) * (1 pile) * (1 - 0/100) = 21.15 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00331 lb/ton) * (1 pile) = 3.31 lb/day (Winter hours)

Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00331 lb/ton) * (1 pile) * (1 - 0/100) = 3.31 lb/day (Winter hours)
Note: Based on the conditions assumed in the predictive equation without additional water spray control.

PM_{10} Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00156 lb/ton
Where: k = particle size multiplier = 0.35 (Value for PM < 10 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 10 mph (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
M = material moisture content = 3% (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
Control Efficiency = 0% (Water or chemical spray)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00156 lb/ton) * (1 pile) = 10.00 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00156 lb/ton) * (1 pile) * (1 - 0/100) = 10.00 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00156 lb/ton) * (1 pile) = 1.56 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00156 lb/ton) * (1 pile) * (1 - 0/100) = 1.56 lb/day (Winter hours)
Note: Based on the conditions assumed in the predictive equation without additional water spray control.

Filterable PM2.5 Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00024 lb/ton
Where: k = particle size multiplier = 0.053 (Value for PM < 2.5 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 10 mph (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
M = material moisture content = 3% (Estimate based on values provided in AP 42, Sec. 13.2.4.3, 11/06)
Control Efficiency = 0% (Water or chemical spray)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00024 lb/ton) * (1 pile) = 1.52 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00024 lb/ton) * (1 pile) * (1 - 0/100) = 1.52 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00024 lb/ton) * (1 pile) = 0.24 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00024 lb/ton) * (1 pile) * (1 - 0/100) = 0.24 lb/day (Winter hours)
Note: Based on the conditions assumed in the predictive equation without additional water spray control.

Conveyor Transfer Point (SCC 3-05-02006)

Maximum Process Rate = 400 ton/hr (Maximum plant process rate)
Maximum Hours of Operation = 16 hrs/day (summer hours)
Maximum Hours of Operation = 2.5 hrs/day (winter hours)
Number of Transfers = 2 transfers (Company Information, based on schematic submitted with application)

Total PM Emissions:
Emission Factor = 0.003 lb/ton (0.0030 uncontrolled, 0.00014 controlled, AP 42, Table 11.19.2-2, 8/04)
Control Efficiency = 50% (Dept Guidance 4/8/93)
Calculation: (400 ton/hr) * (16 hrs/day) * (2 transfers) * (0.003 lb/ton) = 38.40 lbs/day
Calculation: (400 ton/hr) * (16 hrs/day) * (2 transfers) * (0.003 lb/ton) * (1 - 50/100) = 19.20 lbs/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (2 transfers) * (0.003 lb/ton) = 6.00 lbs/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (2 transfers) * (0.003 lb/ton) * (1 - 50/100) = 3.00 lbs/day
Note: Based on uncontrolled emissions factors with 50% reduction for water spray, AP42, Table 11.19.2-2, note b.

Total PM_{10} Emissions:
Emission Factor = 0.0011 lb/ton (0.00110 uncontrolled, 0.000046 controlled, AP 42, Table 11.19.2-2, 8/04)
Control Efficiency = 50%
Calculation: (400 ton/hr) * (16 hrs/day) * (2 transfers) * (0.0011 lb/ton) = 14.08 lbs/day
Calculation: (400 ton/hr) * (16 hrs/day) * (2 transfers) * (0.0011 lb/ton) * (1 - 50/100) = 7.04 lbs/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (2 transfers) * (0.0011 lb/ton) = 2.20 lbs/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (2 transfers) * (0.0011 lb/ton) * (1 - 50/100) = 1.10 lbs/day
Note: Based on uncontrolled emissions factors with 50% reduction for water spray, AP42, Table 11.19.2-2, note b.

Hot Oil Heater

Production Rate = 22.50 gal/hr (max. rated process rate. Company information)
Maximum Hours of Operation = 16 hrs/day (summer hours)
Maximum Hours of Operation = 2.5 hrs/day (winter hours)

CO Emissions:
Emission Factor = 0.0012 lb/gal (AP-42, Section 11.1, Table 11.1-13, No. 2 Fuel Oil, 3/04)
Control Efficiency = 0%
Calculation: (16 hrs/day) * (22.5 gal/hr) * (0.0012 lb/gal) = 0.43 lbs/day (Summer hours)
Calculation: (16 hrs/day) * (22.5 gal/hr) * (0.0012 lb/gal) * (1 - 0/100) = 0.43 lbs/day (Summer hours)
Calculation: (2.5 hrs/day) * (22.5 gal/hr) * (0.0012 lb/gal) = 0.07 lbs/day (Winter hours)
Calculation: (2.5 hrs/day) * (22.5 gal/hr) * (0.0012 lb/gal) * (1 - 0/100) = 0.07 lbs/day (Winter hours)

CO_2 Emissions:
Emission Factor = 28 lb/gal (AP-42, Section 11.1, Table 11.1-13, No. 2 Fuel Oil, 3/04)
Control Efficiency = 0%
Calculation: (16 hrs/day) * (22.5 gal/hr) * (28 lb/gal) = 10,080.00 lbs/day (Summer hours)
Calculation: (16 hrs/day) * (22.5 gal/hr) * (28 lb/gal) * (1 - 0/100) = 10,080.00 lbs/day (Summer hours)
Calculation: (2.5 hrs/day) * (22.5 gal/hr) * (28 lb/gal) = 1,575.00 lbs/day (Winter hours)
Calculation: (2.5 hrs/day) * (22.5 gal/hr) * (28 lb/gal) * (1 - 0/100) = 1,575.00 lbs/day (Winter hours)

Dryer, fabric filter (SCC 3-05-002-05, -55 to -63)

Operating Parameters:

Plant Elevation:	3200	ft.	avg elev of 7 (cities) counties listed in application
Actual Pressure:	26.72	in. Hg	Estimate
Standard Pressure:	29.92	in. Hg	
Actual Flowrate (V2):	76,638	acfm	(Company Information)
Standard Temp:	20	C	68 F = 528 R
Assumed Stack Temp.	146	C	295 F = 755 R
			(avg of range submitted by applicant: 215-375° F)

Standard Volumetric Flowrate Correction: V1 = V2 (P2/P1) (T1/T2)
V1=76638 acfm * (26.72 in. Hg / 29.92 in. Hg) * (528 R / 755 R)

Corrected Flowrate (V1):	47,869	scfm	
Stack Gas Moisture Content (M):	12	%	(estimate)

=V1*(1 - M/100) = 47,869 scfm
Dry Standard Volumetric Flowrate: * (1 - 12/100)
Dry Standard Volumetric Flowrate: 42,125 dscfm

Dryer, fabric filter (SCC 3-05-002-05, -55 to -63) (Burning Fuel Oil)

Maximum Process Rate = 400 ton/hr (Application information)
Maximum Hours of Operation = 16 hrs/day (summer hours)
Maximum Hours of Operation = 2.5 hrs/day (winter hours)
Dry Standard Volumetric Flowrate: 42,125 dscfm

Filterable PM Emissions:
Based on Emission Limit
Emission Factor = 0.04 gr/dscf (permit limit)
Calculation: (0.04 gr/dscf) * (42,125 dscfm) * (1 lb / 7000 gr) * (60 min/hr) = 14.44 lb/hr

Calculation: (14.44 lb/hr) * (16 hrs/day) = 231.09 lbs/day (Summer hours)
Calculation: (14.44 lb/hr) * (2.5 hrs/day) = 36.11 lbs/day (Winter hours)
Filterable PM_{10} Emissions:
Based on Emission Limit
Emission Factor = 0.02 gr/dscf (permit limit, assuming 50% of TSP is PM10, Department policy)
Calculation: (0.02 gr/dscf) * (42,125 dscfm) * (1 lb / 7000 gr) * (60 min/hr) = 7.22 lb/hr
Calculation: (7.22 lb/hr) * (16 hrs/day) = 115.54 lbs/day (Summer hours)
Calculation: (7.22 lb/hr) * (2.5 hrs/day) = 18.05 lbs/day (Winter hours)

Filterable $PM_{2.5}$ Emissions:
Based on Emission Limit
Emission Factor = 0.0084 gr/dscf (permit limit, assuming 21% of TSP is PM2.5, AP 42, Table 11.1-4, 3/04)
Calculation: (0.0084 gr/dscf) * (42,125 dscfm) * (1 lb / 7000 gr) * (60 min/hr) = 3.03 lb/hr
Calculation: (3.03 lb/hr) * (16 hrs/day) = 48.53 lbs/day (Summer hours)
Calculation: (3.03 lb/hr) * (2.5 hrs/day) = 7.58 lbs/day (Winter hours)

Condensable $PM_{2.5}$ Emissions:
Based on AP-42
Emission Factor = 0.0194 lb/ton (fabric filter, AP 42, Table 11.1-3, 3/04, inorganic+organic)
Control Efficiency = 0%

Calculation: (400 ton/hr) * (16 hrs/day) * (0.0194 lb/ton) = 124.16 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.0194 lb/ton) * (1 - 0/100) = 124.16 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.0194 lb/ton) = 19.40 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.0194 lb/ton) * (1 - 0/100) = 19.40 lb/day (Winter hours)

CO Emissions:
Emission Factor = 0.13 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.13 lb/ton) = 832.00 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.13 ton/yr) * (1 - 0/100) = 832.00 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.13 lb/ton) = 130.00 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.13 lb/ton) * (1 - 0/100) = 130.00 lb/day (Winter hours)

NOx Emissions:
Emission Factor = 0.055 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.055 lb/ton) = 352.00 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.055 ton/yr) * (1 - 0/100) = 352.00 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.055 lb/ton) = 55.00 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.055 lb/ton) * (1 - 0/100) = 55.00 lb/day (Winter hours)

SO_2 Emissions:
Emission Factor = 0.011 lb/ton (0.011 lb/ton #2 fuel oil, 0.19 lb/ton coal, AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.011 lb/ton) = 70.40 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.011 ton/yr) * (1 - 0/100) = 70.40 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.011 lb/ton) = 11.00 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.011 lb/ton) * (1 - 0/100) = 11.00 lb/day (Winter hours)

TOC Emissions:
Emission Factor = 0.044 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-8, 3/04)

Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.044 lb/ton) = 281.60 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.044 ton/yr) * (1 - 0/100) = 281.60 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.044 lb/ton) = 44.00 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.044 lb/ton) * (1 - 0/100) = 44.00 lb/day (Winter hours)

CH_4 Emissions:
Emission Factor = 0.012 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-8, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.012 lb/ton) = 76.80 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.012 lb/ton) * (1 - 0/100) = 76.80 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.012 lb/ton) = 12.00 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.012 lb/ton) * (1 - 0/100) = 12.00 lb/day (Winter hours)
CO2e = 3.00 * 21 = 63.00 ton/yr

VOC Emissions:
Emission Factor = 0.032 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-8, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.032 lb/ton) = 204.80 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.032 lb/ton) * (1 - 0/100) = 204.80 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.032 lb/ton) = 32.00 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.032 lb/ton) * (1 - 0/100) = 32.00 lb/day (Winter hours)

Total HAPs Emissions:
Emission Factor = 0.0087 lb/ton (#2 fuel oil-fired dryer with fabric filter, AP 42, Table 11.1-10, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.0087 lb/ton) = 55.68 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.0087 lb/ton) * (1 - 0/100) = 55.68 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.0087 lb/ton) = 8.70 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.0087 lb/ton) * (1 - 0/100) = 8.70 lb/day (Winter hours)

CO_2 Emissions:
Emission Factor = 33 lb/ton (#2 fuel oil-fired dryer, AP 42, Table 11.1-7, 3/04)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (33 lb/ton) = 211,200.00 lb/day (Summer hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (33 lb/ton) * (1 - 0/100) = 211,200.00 lb/day (Summer hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (33 lb/ton) = 33,000.00 lb/day (Winter hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (33 lb/ton) * (1 - 0/100) = 33,000.00 lb/day (Winter hours)

Silo Filling (SCC 3-05-002-13)

Maximum Process Rate = 400 ton/hr (Maximum plant process rate)
Maximum Hours of Operation = 16 hrs/day (summer hours)
Maximum Hours of Operation = 2.5 hrs/day (winter hours)

Total PM Emissions: (Total PM is assumed to be predominantly PM-2.5 since emissions consist of condensed vapors; AP 42, Table 11.1-14. Therefore, this calculation assumes there are no filterable particulate emissions)
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.000332 + 0.00105(-V)e^((0.0251)(T + 460) - 20.43) = 0.00045 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (avg of range submitted by applicant: 215-375^0 F)
Control Efficiency = 0%

Calculation: (400 ton/hr) * (16 hrs/day) * (0.00045 lb/ton) * = 2.89 lb/day (Summer Hours)

Calculation: (400 ton/hr) * (16 hrs/day) * (0.00045 lb/ton) * (1 - 0/100) = 2.89 lb/day (Summer Hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00045 lb/ton) * = 0.45 lb/day (Winter Hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00045 lb/ton) * (1 - 0/100) = 0.45 lb/day (Winter Hours)

Organic PM Emissions : (if organic particulate needs to be calculated)
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.00105(-V)e^((0.0251)(T + 460) - 20.43) = 0.00012 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (avg of range submitted by applicant: 215-375^0 F)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00012 lb/ton) = 0.77 lb/day (Summer Hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00012 lb/ton) * (1 - 0/100) = 0.77 lb/day (Summer Hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00012 lb/ton) * = 0.12 lb/day (Winter Hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00012 lb/ton) * (1 - 0/100) = 0.12 lb/day (Winter Hours)

VOC Emissions: (VOC = TOC * 94%, AP-42, Table 11.1-16, 3/04)
Predictive equation for TOC emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.0504(-V)e^((0.0251)(T + 460) - 20.43) * (94%) = 0.00539 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (avg of range submitted by applicant: 215-375^0 F)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00539 lb/ton) = 34.53 lb/day (Summer Hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00539 lb/ton) * (1 - 0/100) = 34.53 lb/day (Summer Hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00539 lb/ton) * = 5.39 lb/day (Winter Hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00539 lb/ton) * (1 - 0/100) = 5.39 lb/day (Winter Hours)

CO Emissions:
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.00488(-V)e^((0.0251)(T + 460) - 20.43) = 0.00056 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (avg of range submitted by applicant: 215-375^0 F)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00056 lb/ton) = 3.56 lb/day (Summer Hours)
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00056 lb/ton) * (1 - 0/100) = 3.56 lb/day (Summer Hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00056 lb/ton) * = 0.56 lb/day (Winter Hours)
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00056 lb/ton) * (1 - 0/100) = 0.56 lb/day (Winter Hours)

Plant Load-Out (SCC 3-05-002-14)

Maximum Process Rate = 400 ton/hr (Maximum plant process rate)
Maximum Hours of Operation = 16 hrs/day (summer hours)
Maximum Hours of Operation = 2.5 hrs/day (winter hours)

Total PM Emissions: (Total PM is assumed to be predominantly PM-2.5 since emissions consist of condensed vapors; AP 42, Table 11.1-14. Therefore, this calculation assumes there are no filterable particulate emissions)
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.000181 + 0.00141(-V)e^((0.0251)(T + 460) - 20.43) = 0.00034 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%

Calculation: (400 ton/hr) * (16 hrs/day) * (0.00034 lb/ton) * = 2.19 lb/day
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00034 lb/ton) * (1 - 0/100) = 2.19 lb/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00034 lb/ton) * = 0.34 lb/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00034 lb/ton) * (1 - 0/100) = 0.34 lb/day

Organic $PM_{2.5}$ Emissions:
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.00141(-V)e^((0.0251)(T + 460) - 20.43) = 0.00016 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00016 lb/ton) * = 1.03 lb/day
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00016 lb/ton) * (1 - 0/100) = 1.03 lb/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00016 lb/ton) * = 0.16 lb/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00016 lb/ton) * (1 - 0/100) = 0.16 lb/day

VOC Emissions: (VOC = TOC * 94%, AP-42, Table 11.1-16, 3/04)
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.0172(-V)e^((0.0251)(T + 460) - 20.43) * 94% = 0.00184 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00184 lb/ton) * = 11.78 lb/day
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00184 lb/ton) * (1 - 0/100) = 11.78 lb/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00184 lb/ton) * = 1.84 lb/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00184 lb/ton) * (1 - 0/100) = 1.84 lb/day

CH_4 Emissions:(CH4 = TOC * 6.5%, AP-42, Table 11.1-16, 3/04)
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.0172(-V)e^((0.0251)(T + 460) - 20.43) * 6.5% = 0.00013 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00013 lb/ton) * = 0.81 lb/day
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00013 lb/ton) * (1 - 0/100) = 0.81 lb/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00013 lb/ton) * = 0.13 lb/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00013 lb/ton) * (1 - 0/100) = 0.13 lb/day
CO2e = 0.03 * 21 = 0.67 ton/yr

CO Emissions:
Predictive equation for emission factor provided per AP 42, Table 11.1-14, 3/04.
Emission Factor = 0.00558(-V)e^((0.0251)(T + 460) - 20.43) = 0.00064 lb/ton
Where: V = Asphalt volatility = -0.5 (Default value per AP 42, Table 11.1-14, 3/04)
T = HMA mix temperature = 295 F (Max. from application, process flow narrative)
Control Efficiency = 0%
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00064 lb/ton) * = 4.07 lb/day
Calculation: (400 ton/hr) * (16 hrs/day) * (0.00064 lb/ton) * (1 - 0/100) = 4.07 lb/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00064 lb/ton) * = 0.64 lb/day
Calculation: (400 ton/hr) * (2.5 hrs/day) * (0.00064 lb/ton) * (1 - 0/100) = 0.64 lb/day

Haul Roads

Vehicle Miles Traveled (VMT) per Day = 5 VMT/day (Estimate)
VMT per hour = (5 VMT/day) * (day/24 hrs) = 0.21 VMT/hr
Maximum Hours of Operation = 16 hrs/day (summer hours)
Maximum Hours of Operation = 2.5 hrs/day (winter hours)

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 = 12.46 lb/VMT
Where: k = constant = 4.9 lbs/VMT (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)
a = constant = 0.7 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (0.21 VMT/hr) * (16 hrs/day) * (12.46 lb/VMT) * = 41.53 lb/day (summer)
Calculation: (0.21 VMT/hr) * (16 hrs/day) * (12.46 lb/VMT) * (1 - 50/100) = 20.77 lb/day (summer)
Calculation: (0.21 VMT/hr) * (2.5 hrs/day) * (12.46 lb/VMT) * = 6.49 lb/day (winter)
Calculation: (0.21 VMT/hr) * (2.5 hrs/day) * (12.46 lb/VMT) * (1 - 50/100) = 3.24 lb/day (winter)

PM_{10} 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 = 3.43 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 = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)
a = constant = 0.9 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (0.21 VMT/hr) * (16 hrs/day) * (3.43 lb/VMT) * = 11.45 lb/day (summer)
Calculation: (0.21 VMT/hr) * (16 hrs/day) * (3.43 lb/VMT) * (1 - 50/100) = 5.72 lb/day (summer)
Calculation: (0.21 VMT/hr) * (2.5 hrs/day) * (3.43 lb/VMT) * = 1.79 lb/day (winter)
Calculation: (0.21 VMT/hr) * (2.5 hrs/day) * (3.43 lb/VMT) * (1 - 50/100) = 0.89 lb/day (winter)

$PM_{2.5}$ 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 = 0.34 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 = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)
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)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (0.21 VMT/hr) * (16 hrs/day) * (0.34 lb/VMT) * = 1.14 lb/day (summer)
Calculation: (0.21 VMT/hr) * (16 hrs/day) * (0.34 lb/VMT) * (1 - 50/100) = 0.57 lb/day (summer)
Calculation: (0.21 VMT/hr) * (2.5 hrs/day) * (0.34 lb/VMT) * = 0.18 lb/day (winter)
Calculation: (0.21 VMT/hr) * (2.5 hrs/day) * (0.34 lb/VMT) * (1 - 50/100) = 0.09 lb/day (winter)

1,474 bhp Diesel Engine/Generator

Operational Capacity of Engine = 1,474 bhp	910	eKW	(from applicant)
	1,474	hp	(from applicant)
Maximum Hours of Operation = 16 hrs/day (summer hours)	16	hrs/day	(summer hours)
Maximum Hours of Operation = 2.5 hrs/day (winter hours)	2.5	hrs/day	(winter hours)

Total $PM/PM_{10}/PM_{2.5}$ Emissions: 0.54 g/kw-hr = 1.08 lbs/hr (EPA Tier 2- FEL, 40CFR 89, Subpart B, Table 2)

Emission Factor = 1.08 lbs/hr			
Calculation: (16 hrs/day) * (1.08 lbs/hr) =	**17.33**	lbs/day	(Summer)
Calculation: (2.5 hrs/day) * (1.08 lbs/hr) =	**2.71**	lbs/day	(Winter)

NOx Emissions: 10.5 g/kw-hr = 21.07 lbs/hr (EPA Tier 2- FEL, 40CFR 89, Subpart B, Table 2)

Emission Factor = 21.07 lbs/hr			
Calculation: (16 hrs/day) * (21.07 lbs/hr) =	**337.12**	lbs/day	(Summer)
Calculation: (2.5 hrs/day) * (21.07 lbs/hr) =	**52.68**	lbs/day	(Winter)

CO Emissions: 3.5 g/kw-hr = 7.02 lbs/hr (EPA Tier 2- 40CFR 89, Subpart B, Table 1)

Emission Factor = 7.02 lbs/hr			
Calculation: (16 hrs/day) * (7.02 lbs/hr) =	**112.35**	lbs/day	(Summer)
Calculation: (2.5 hrs/day) * (7.02 lbs/hr) =	**17.55**	lbs/day	(Winter)

VOC Emissions:

Emission Factor = 0.0025141 lbs/hp-hr			(AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)
Calculation: (16 hrs/day) * (1,474 hp) * (0.00251 lbs/hp-hr) =	**59.29**	lbs/yr	(Summer)
Calculation: (2.5 hrs/day) * (1,474 hp) * (0.00251 lbs/hp-hr) =	**9.26**	lbs/day	(Winter)

SOx Emissions:

Emission Factor = 0.00205 lbs/hp-hr			(AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (16 hrs/day) * (1,474 hp) * (0.00205 lbs/hp-hr) =	**48.35**	lbs/yr	(Summer)
Calculation: (2.5 hrs/day) * (1,474 hp) * (0.00205 lbs/hp-hr) =	**7.55**	lbs/day	(Winter)

CO_2 Emissions:

Emission Factor = 1.15 lbs/hp-hr			(AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (16 hrs/day) * (1,474 hp) * (1.15 lbs/hp-hr) =	**27,121.60**	lbs/yr	(Summer)
Calculation: (2.5 hrs/day) * (1,474 hp) * (1.15 lbs/hp-hr) =	**4,237.75**	lbs/day	(Winter)

274 bhp Diesel Engine/Generator

Operational Capacity of Engine = 274 bhp	205	eKW	(from applicant)
	274	hp	(from applicant)
Maximum Hours of Operation = 16 hrs/day (summer hours)	16	hrs/day	(summer hours)
Maximum Hours of Operation = 2.5 hrs/day (winter hours)	2.5	hrs/day	(winter hours)

Total $PM/PM_{10}/PM_{2.5}$ Emissions: 0.54 g/kw-hr = 0.244 lbs/hr (EPA Tier 3- FEL, 40CFR 89, Subpart B, Table 2)

Emission Factor = 0.244 lbs/hr			
Calculation: (16 hrs/day) * (0.244 lbs/hr) =	**3.90**	lbs/day	(Summer)
Calculation: (2.5 hrs/day) * (0.244 lbs/hr) =	**0.61**	lbs/day	(Winter)

NOx Emissions: 6.6 g/kw-hr = 2.98 lbs/hr (EPA Tier 3- FEL, 40CFR 89, Subpart B, Table 2)

Emission Factor = 2.98lbs/hr			
Calculation: (16 hrs/day) * (2.98lbs/hr) =	**47.68**	lbs/day	(Summer)
Calculation: (2.5 hrs/day) * (2.98lbs/hr) =	**7.45**	lbs/day	(Winter)

CO Emissions: 3.5 g/kw-hr = 1.58 lbs/hr (EPA Tier 3- 40CFR 89, Subpart B, Table 1)

Emission Factor = 1.58 lbs/hr			
Calculation: (16 hrs/day) * (1.58 lbs/hr) =	**25.31**	lbs/day	(Summer)

Calculation: (2.5 hrs/day) * (1.58 lbs/hr) = **3.95** lbs/day (Winter)

VOC Emissions:
Emission Factor = 0.00251 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)
Calculation: (16 hrs/day) * (274 hp) * (0.00251 lbs/hp-hr) = **11.02** lbs/yr (Summer)
Calculation: (2.5 hrs/day) * (274 hp) * (0.00251 lbs/hp-hr) = **1.72** lbs/day (Winter)

SOx Emissions:
Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (16 hrs/day) * (274 hp) * (0.00205 lbs/hp-hr) = **8.99** lbs/yr (Summer)
Calculation: (2.5 hrs/day) * (274 hp) * (0.00205 lbs/hp-hr) = **1.40** lbs/day (Winter)

CO_2 Emissions:
Emission Factor = 1.15 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (16 hrs/day) * (274 hp) * (1.15 lbs/hp-hr) = **5,041.6** lbs/yr (Summer)
Calculation: (2.5 hrs/day) * (274 hp) * (1.15 lbs/hp-hr) = **787.75** lbs/day (Winter)

Lime Silo

Operating Parameters:

Plant Elevation:	4200	ft. avg elev of 5 (cities) counties listed in application				
Actual Pressure:	25.72	in. Hg Estimate				
Standard Pressure:	29.92	in. Hg				
Actual Flowrate (V2):	1,000	acfm (similar sized facility)				
Standard Temp:	20	C	68	F	528	R
Assumed Stack Temp.	68	F	68	F	528	R
						assume ambient temp

Standard Volumetric Flowrate Correction: V1 = V2 (P2/P1) (T1/T2)
V1=1000 * (25.7241958041958 / 29.92) * (528 R / 528 R)

Corrected Flowrate (V1):	860	scfm	
Stack Gas Moisture Content (M):	0	%	(estimate)
Dry Standard Volumetric Flowrate:	=V1*(1 - M/100) = 860 scfm * (1 - 0/100)		
Dry Standard Volumetric Flowrate:	860	dscfm	

Lime Silo

Flow Capacity = 860 cfm (similar sized facility) 860 cfm
Maximum Hours of Operation = 16 hrs/day (Summer Hours) 16 hrs/day
Maximum Hours of Operation = 2.5 hrs/day (Winter Hours) 2.5 hrs/day

Total PM Emissions:
Emission Factor = 0.04 gr/dscf (Permit limit per NSPS) 0.04 gr/dscf
Control Efficiency = 0% 0 %
Calculation: (860 cfm) * (16 hrs/day) * (0.04 gr/dscf) * (lb/7000 gr) * (60 min/hr) = **4.72** lb/day (summer)
Calculation: (860 cfm) * (2.5 hrs/day) * (0.04 gr/dscf) * (lb/7000 gr) * (60 min/hr) = **0.74** lb/day (winter)

Total PM_{10} Emissions:
Emission Factor = 0.02 gr/dscf Assume PM10 = 50% of PM, Department Policy 0.02 gr/dscf
Control Efficiency = 0% 0 %
Calculation: (860 cfm) * (16 hrs/day) * (0.02 gr/dscf) * (lb/7000 gr) * (60 min/hr) = **2.36** lb/day (summer)
Calculation: (860 cfm) * (2.5 hrs/day) * (0.02 gr/dscf) * (lb/7000 gr) * (60 min/hr) = **0.37** lb/day (winter)

Total $PM_{2.5}$ Emissions:
Emission Factor = 0.012 gr/dscf Assume PM2.5 = 30% of PM, AP-42, Appendix B-2, Category 4 0.012 gr/dscf
Control Efficiency = 0% 0 %
Calculation: (860 cfm) * (16 hrs/day) * (0.012 gr/dscf) * (lb/7000 gr) * (60 min/hr) = **1.42** lb/day (summer)

Calculation: (860 cfm) * (2.5 hrs/day) * (0.012 gr/dscf) * (lb/7000 gr) * (60 min/hr) = **0.22** lb/day (winter)

V. Existing Air Quality

On July 1, 1987, the Environmental Protection Agency (EPA) promulgated new National Ambient Air Quality Standards (NAAQS) for particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}). Due to exceedances of the national standards for PM_{10}, the cities of Kalispell (and the nearby Evergreen area), Columbia Falls, Butte, Whitefish, Libby, Missoula, and Thompson Falls were designated by EPA as nonattainment for PM_{10}. As a result of this designation, the EPA required the Department and the City-County Health Departments to submit PM_{10} State Implementation Plans (SIP). The SIPs consisted of emission control plans that controlled fugitive dust emissions from roads, parking lots, construction, and demolition, since technical studies identified these sources to be the major contributors to PM_{10} emissions.

MAQP #4630-01 and Addendum 2 are for a portable asphalt plant that will locate at sites in or within 10 kilometers (km) of certain PM_{10} nonattainment areas. The more stringent operating conditions contained in the addendum will minimize any potential impact on the nonattainment areas and will protect the national ambient air quality standards. Also, this facility is a portable source that would be expected to operate on an intermittent and temporary basis and any effects on air quality would be expected to be minor and short-lived.

VI. Air Quality Impacts

MAQP #4630-01 and Addendum 2 will cover the operations of this portable asphalt plant while operating at any location within Montana, excluding those counties that have a Department approved permitting program and those areas that are tribal lands.

Addendum 2 will cover the operations of this portable asphalt plant while operating in or within 10 km of PM_{10} nonattainment area during the winter months (October 1 through March 31). Additionally, the facility will also be allowed to operate in or within 10 km of certain PM_{10} nonattainment areas during the summer months (April 1 through September 30).

VII. Taking or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the Department conducted the following private property taking and damaging assessment (see Section VII of the Permit Analysis for MAQP #4630-01) and determined there are no taking or damaging implications.

VIII. Environmental Assessment

The current permit action is an administrative amendment and does not constitute a state action; therefore, an environmental assessment is not required for the proposed project.

Addendum Analysis prepared by: Deanne Fischer
Date: May 3, 2011