Mr. Daniel T. Crago
Paul H. Rohe Company, Inc.
P. O. Box 67
Aurora, Indiana 47001

Re: SMF 029-9881
First Significant Modification to
FESOP F029-7416-03187

Dear Mr. Crago:

Paul H. Rohe Company, Inc. was issued a Federally Enforceable State Operating Permit (FESOP) on July 7, 1997 for a stationary hot mix asphalt batch plant. A letter requesting a significant modification was received on June 22, 1998. Pursuant to the provisions of 326 IAC 2-8-11(d) the permit is hereby approved as described in the attached Technical Support Document and Emission Calculations.

The modification consists of increasing the maximum capacity of the one (1) aggregate rotary dryer from 120 tons per hour to 150 tons per hour. The source is also fulfilling the requirements of 326 IAC 2-1-3.2 (State construction and operating permits: enhanced new source review).

All other conditions of the permit shall remain unchanged and in effect. Please attach a copy of this amendment to the front of the original permit.

This decision is subject to the Indiana Administrative Orders and Procedures Act -IC 4-21.5-3-5. If you have any questions on this matter, please contact Catherine Moore, of my staff, at 317-233-2637 or 1-800-451-6027 (ext 3-2637).

Sincerely,

Paul Dubenetzky, Chief
Permits Branch
Office of Air Management

Attachments
cam
cc: File - Dearborn County
U.S. EPA, Region V
Dearborn County Health Department
Air Compliance Section - Warren Greiling
Compliance Data Section - Jerri Curless
Administration and Development Section - Janet Mobley
Technical Support and Modeling - Nancy Landau

# FEDERALLY ENFORCEABLE STATE OPERATING PERMIT (FESOP) and ENHANCED NEW SOURCE REVIEW (ENSR) OFFICE OF AIR MANAGEMENT

**Paul H. Rohe Company, Inc.**
**3919 East Laughery Creek Road**
**Aurora, Indiana 47001**

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the facilities listed in Section A (Source Summary) of this permit.

This permit is issued in accordance with 326 IAC 2 and 40 CFR 70 and contains the conditions and provisions specified in 326 IAC 2-8 and 40 CFR 70.6 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments) and IC 13-15 and IC 13-17 (prior to July 1, 1996, IC 13-1-1-4 and IC 13-7-10).

| Operation Permit No.: F029-7416-03187 | |
|---|---|
| Issued by:<br>Paul Dubenetzky, Branch Chief<br>Office of Air Management | Issuance Date: July 7, 1997 |

| First Significant Modification: SMF 029-9881 | Pages Affected: 4, 23 - 26, 30a |
|---|---|
| Issued by:<br>Paul Dubenetzky, Branch Chief<br>Office of Air Management | Issuance Date: |

# SECTION A SOURCE SUMMARY

A.1 General Information

The Permittee owns and operates a stationary hot mix asphalt batch plant.

| | |
|---|---|
| Responsible Official: | Daniel T. Crago, Environmental and Quality Control Manager |
| Source Address: | 3919 East Laughery Creek Road, Aurora, Indiana 47001 |
| Mailing Address: | P.O. Box 67, Aurora, Indiana 47001 |
| SIC Code: | 2951 |
| County Location: | Dearborn |
| County Status: | Attainment for all criteria pollutants |
| Source Status: | Minor Source, FESOP Program<br>Minor Source, PSD Program |

A.2 Emission Units and Pollution Control Summary

This stationary source consists of the following emission units and pollution control devices:

(a) one (1) aggregate rotary dryer, with a maximum capacity of 150 tons per hour, equipped with one (1) No. 2 distillate fuel oil fired aggregate dryer burner with a maximum rated capacity of 33.12 million (MM) British thermal units (Btu) per hour, using one (1) cyclone and one (1) jet pulse baghouse for air pollution control, and exhausting at one (1) stack, identified as SV/1;
(b) one (1) enclosed mixing and batching tower with a maximum capacity of 150 tons per hour;
(c) one (1) cold aggregate feeder conveyor; and
(d) one (1) recycled asphalt pavement (RAP) feeder conveyor.

A.3 Insignificant Activities

This stationary source also includes the following insignificant activities, as defined in 326 IAC 2-7-1(20):

(a) one (1) liquid asphalt storage tank, identified as Tank 1, with a maximum storage capacity of 20,000 gallons;
(b) one (1) liquid asphalt storage tank, identified as Tank 2, with a maximum storage capacity of 10,000 gallons;
(c) one (1) No. 2 distillate fuel oil storage tank, identified as Tank 3, with a maximum storage capacity of 12,000 gallons;
(d) one (1) No. 2 distillate fuel oil storage tank, identified as Tank 4, with a maximum storage capacity of 500 gallons;
(e) a gasoline fuel transfer and dispensing operation handling less than or equal to 1,300 gallons per day, such as filling tanks, locomotives, automobiles, having a storage capacity less than or equal to 10,500 gallons;
(f) cleaners and solvents having a vapor pressure equal to or less than 0.7 kPa; 5 mm Hg; or 0.1 psi measured at 20ºC (68ºF); the use of which for all cleaners and solvents combined does not exceed 145 gallons per 12 months; and
(g) paved and unpaved roads and parking lots with public access.

**SECTION D.1 FACILITY OPERATION CONDITIONS**

| | |
|---|---|
| (a) | one (1) aggregate rotary dryer, with a maximum capacity of 150 tons per hour, equipped with one (1) No. 2 distillate fuel oil fired aggregate dryer burner with a maximum rated capacity of 33.12 million (MM) British thermal units (Btu) per hour, using one (1) cyclone and one (1) jet pulse baghouse for air pollution control, and exhausting at one (1) stack, identified as SV/1; |
| (b) | one (1) enclosed mixing and batching tower with a maximum capacity of 150 tons per hour; |
| (c) | one (1) cold aggregate feeder conveyor; and |
| (d) | one (1) recycled asphalt pavement (RAP) feeder conveyor. |

**Emissions Limitations and Standards [326 IAC 2-8-4(1)] [326 IAC 6-3]**

D.1.1 Particulate Matter [326 IAC 6-1-8.1(d)] [326 IAC 6-3]
Pursuant to 326 IAC 326 IAC 6-1-8.1(d), the particulate matter emissions from the mixing and drying operation shall be limited to 0.22 grains per dry standard cubic foot and to 19.10 tons particulate matter (PM) per year (equivalent to 4.36 pounds per hour). This limit will also satisfy the requirements of 326 IAC 6-3 (Process Operations) and 326 IAC 2-2 (Prevention of Significant Deterioration).

D.1.1a Hot Mix Asphalt Production Limit
The one (1) aggregate rotary dryer shall be limited to 150 tons per hour. The Permittee shall record the hours of plant operation per day and the total asphalt production per day. The average production per hour for each day shall not exceed 150 tons per hour.

D.1.2 Particulate Matter 10 Microns (PM-10)
Pursuant to 326 IAC 2-8-4, particulate matter 10 microns emissions from the aggregate mixing and drying operation shall not exceed 20.6 pounds per hour, including both filterable and condensible fractions. Compliance with this limit will satisfy 326 IAC 2-8-4. Therefore, the Part 70 rules (326 IAC 2-7) do not apply.

D.1.3 Sulfur Dioxide ($SO_2$)
Pursuant to 326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations), sulfur dioxide emissions from the 33.12 million Btu per hour burner for the aggregate dryer shall be limited to 0.5 pounds per million Btu heat input or a sulfur content of less than or equal to 0.49% when using distillate oil.

Pursuant to 326 IAC 7-1.1-2, this sulfur dioxide limit applies at all times including periods of startup, shutdown, and malfunction.

**Testing Requirements [326 IAC 2-8-4(3)]**

D.1.4 Particulate Matter
Within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up of the new production capacity, the Permittee shall perform PM and PM-10 testing utilizing Methods 5 or 17, per 40 CFR Part 60 Appendix A, and Methods 201 or 201a and Method 202, per 40 CFR Part 51 Appendix M, or as approved by the Commissioner. This test shall be repeated at least once every five years from the date of this valid compliance demonstration. PM-10 includes filterable and condensible PM-10. In addition to these requirements, IDEM may require compliance testing when necessary to determine if the facility is in compliance.

D.1.5 Sulfur Dioxide Emissions and Sulfur Content
The Permittee shall test for:

(a) Sulfur content of oil burned as fuel by the 33.12 million Btu per hour burner for the aggregate dryer using 40 CFR Part 60, Appendix A, Method 19 for each load of oil delivered; or

(b) Sulfur dioxide emissions from the 33.12 million Btu per hour burner for the aggregate dryer, using 40 CFR Part 60, Appendix A, Method 6 each time a test to comply with Condition D.1.4 is performed.

Sulfur content tests made by the oil supplier and an oil supplier certification can be used to replace the test.

**Compliance Monitoring Requirements [326 IAC 2-8-5(a)(1)]**

D.1.6 Daily Visible Emission Notations
Daily visible emission notations of the conveyors, transfer points, aggregate storage piles, unpaved roads, the mixing and batching tower, and the drying operation stack exhaust, shall be performed during normal daylight operations. A trained employee will record whether emissions are normal or abnormal. For processes operated continuously "normal" means those conditions prevailing, or expected to prevail, 80 percent of the time the process is in operation, not counting startup or shut down time. In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions. A trained employee is an employee who has worked at the plant at least one month and has been trained in the appearance and characteristics of normal visible emissions for that specific process. The Preventive Maintenance Plan for this unit shall contain troubleshooting contingency and corrective actions for when an abnormal emission is observed.

D.1.7 Pressure Drop Readings
The Permittee shall take readings of the total static pressure drop across the baghouse controlling the drying operation, at least once a day when the drying process is in operation. Unless operated under conditions for which the Preventive Maintenance Plan specifies otherwise, the pressure drop across the baghouse shall be maintained within the range of 2.0 and 6.0 inches of water or a range established during the latest stack test. The Preventive Maintenance Plan for this unit shall contain troubleshooting contingency and corrective actions for when the pressure reading is outside of the above mentioned range for any one reading.

The instrument used for determining the pressure shall comply with condition C.14 - Pressure Gauge Specifications, be subject to approval by IDEM, OAM, and shall be calibrated at least once every six (6) months.

D.1.8 Preventive Maintenance [326 IAC 2-8-4(9)]
A Preventive Maintenance Plan, in accordance with Condition B.13 of this permit, is required for this source.

D.1.9 Preventive Inspections
The following inspections shall be performed when the aggregate dryer is operating in accordance with the Preventive Maintenance Plan prepared pursuant to Condition B.13:

Daily:

1) Check baghouse air compressor for proper operation and air pressures
2) Check exhaust fan and screw conveyor drives for proper operation
3) Monitor pressure drop across filter
4) Check exhaust plume for visible emissions
5) Monitor inlet temperature to baghouse to prevent overheating of the bags
6) Pulse the bags clean at the end of the day
7) Allow screw conveyor to run to remove dust

Weekly:

1) Check compressed air system for leaks
2) Check duct work and baghouse housing for holes and air leaks

Monthly:

1) Check filter bags for leaks
2) Check screw conveyor hanger bearings for wear and proper operation
3) Check filter pulse system for proper operation

Yearly:

1) Check filter bags to determine useful life remaining in bags
2) Check baghouse structure and duct work for worn areas

D.1.10 Broken Bag or Failure Detection
That in the event that bag failure has been observed:

(a) The affected compartments will be shut down immediately until the units have been replaced.

(b) Based upon the findings of the inspection, any additional corrective actions will be devised within eight (8) hours of discovery and will include a timetable for completion.

D.1.11 Fuel Oil Sampling and Analysis
Oil samples shall be collected from the fuel tank immediately after the fuel tank is filled and before any oil is combusted. The Permittee shall analyze the oil sample to determine the sulfur content of the oil in accordance with 326 IAC 3-3-4. If a partially empty fuel tank is refilled, a new sample and analysis is required upon filling. Vendor analysis of the fuel oil is acceptable, in lieu of the above, if accompanied by a certification.

**Record Keeping and Reporting Requirements [326 IAC 2-8-4(3)]**

D.1.12 Operational Parameters
The Permittee shall maintain a daily record for the cyclone and baghouse controlling particulate matter emissions from the asphalt drying operation of the following values:

(a) Inlet and outlet differential static pressure;

(b) Visible observations;

(c) Checklist with dates and initials for each preventive action performed; and

(d) Records of corrective actions.

D.1.13 Distillate Fuel Oil Usage

(a) Complete and sufficient records shall be kept to establish compliance with the No. 2 fuel oil sulfur content limit established in this permit and contain a minimum of the following:

(1) Calendar dates covered in the compliance determination period;

(2) Sulfur dioxide content of all fuel oils used;

(3) A certification, signed by the owner or operator, that the records of the fuel supplier certifications represent all of the fuel combusted during the period; and

(4) Fuel supplier certifications.

(b) The supplier certification shall contain, as a minimum, the following:

(1) The name of the oil supplier; and

(2) A statement from the oil supplier that certifies the sulfur content and heat content of the fuel oil.

D.1.14 Quarterly Reporting

A quarterly summary to document compliance with operation condition number D.1.3 and Condition D.1.1a shall be submitted, to the address listed in Section C.20 - General Reporting Requirements, using the enclosed forms or their equivalent, within thirty (30) days after the end of the quarter being reported.

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
# OFFICE OF AIR MANAGEMENT
# COMPLIANCE DATA SECTION

## FESOP Monthly Report

Source Name: Paul H. Rohe Company, Inc.
Source Address: 3919 East Laughery Creek Road, Aurora, Indiana 47001
Mailing Address: P.O. Box 67, Aurora, Indiana 47001
FESOP No.: F029-7416-03187
Facility: aggregate dryer
Limit: 150 tons per hour

**Month:** _____ **Year:** _____

| Day | Hours of Plant Operation | Total Production (tons) | Avg Hourly Production (tons/hr) | Day | Hours of Plant Operation | Total Production (tons) | Avg Hourly Production (tons/hr) |
|---|---|---|---|---|---|---|---|
| 1 | | | | 17 | | | |
| 2 | | | | 18 | | | |
| 3 | | | | 19 | | | |
| 4 | | | | 20 | | | |
| 5 | | | | 21 | | | |
| 6 | | | | 22 | | | |
| 7 | | | | 23 | | | |
| 8 | | | | 24 | | | |
| 9 | | | | 25 | | | |
| 10 | | | | 26 | | | |
| 11 | | | | 27 | | | |
| 12 | | | | 28 | | | |
| 13 | | | | 29 | | | |
| 14 | | | | 30 | | | |
| 15 | | | | 31 | | | |
| 16 | | | | | | | |

**9** No deviation occurred in this month.

**9** Deviation/s occurred in this month.
Deviation has been reported on: _____

Submitted by: _____
Title/Position: _____
Signature: _____
Date: _____
Phone: _____

# Indiana Department of Environmental Management
# Office of Air Management

## Technical Support Document for the Significant Modification to the Federally Enforceable State Operating Permit (FESOP) and Enhanced New Source Review (ENSR)

| | |
|---|---|
| **Source Name:** | Paul H. Rohe Company, Inc. |
| **Source Location:** | 3919 East Laughery Creek Road, Aurora, Indiana 47001 |
| **County:** | Dearborn |
| **SIC Code:** | 2951 |
| **Significant Modification No.:** | SMF 029-9881-03187 |
| **Operation Permit No.:** | F029-7416-03187 |
| **Permit Reviewer:** | Catherine Moore |

The Federally Enforceable State Operating Permit (FESOP) was issued on July 7, 1997. On June 22, 1998, Paul H. Rohe Company, Inc. filed an Amendment requesting certain changes to the permit. This proposed Significant Modification to the Federally Enforceable State Operating Permit (FESOP) does not contain any new proposed emission units. The source has requested to increase the maximum capacity of the one (1) aggregate rotary dryer from 120 tons per hour to 150 tons per hour. This results in an increase of uncontrolled Particulate Matter (PM) emissions of 10,204.86 tons per year and an increase of uncontrolled PM10 emissions of 591.32 tons per year. The actual maximum capacity of this dryer is 185 tons per hour. Therefore, the dryer shall be limited to 150 tons per hour.

The following changes were agreed to and made as the First Significant Modification for this source (~~strikeout~~ added to show what was deleted and **bold** added to show what was added):

1. Condition A.2 “Emission Units and Pollution Control Equipment Summary” has been changed to be as follows to change the maximum capacity of the aggregate rotary dryer from 120 tons per hour to 150 tons per hour:

A.2 Emission Units and Pollution Control Summary

This stationary source consists of the following emission units and pollution control devices:

(a) one (1) aggregate rotary dryer, with a maximum capacity of ~~120~~ **150** tons per hour, equipped with one (1) No. 2 distillate fuel oil fired aggregate dryer burner with a maximum rated capacity of 33.12 million (MM) British thermal units (Btu) per hour, using one (1) cyclone and one (1) jet pulse baghouse for air pollution control, and exhausting at one (1) stack, identified as SV/1;
(b) one (1) enclosed mixing and batching tower with a maximum capacity of 120 tons per hour;
(c) one (1) cold aggregate feeder conveyor; and
(d) one (1) recycled asphalt pavement (RAP) feeder conveyor.

2. The equipment listed in Section D.1 “FACILITY OPERATION CONDITIONS” has been changed to be as follows to change the maximum capacity of the aggregate rotary dryer from 120 tons per hour to 150 tons per hour:

| | |
|---|---|
| (a) | one (1) aggregate rotary dryer, with a maximum capacity of ~~120~~ **150** tons per hour, equipped with one (1) No. 2 distillate fuel oil fired aggregate dryer burner with a maximum rated capacity of 33.12 million (MM) British thermal units (Btu) per hour, using one (1) cyclone and one (1) jet pulse baghouse for air pollution control, and exhausting at one (1) stack, identified as SV/1; |
| (b) | one (1) enclosed mixing and batching tower with a maximum capacity of 120 tons per hour; |
| (c) | one (1) cold aggregate feeder conveyor; and |
| (d) | one (1) recycled asphalt pavement (RAP) feeder conveyor. |

3. Condition D.1.1 "Particulate Matter" has been changed to be as follows to change the allowable Particulate Matter (PM) emission limitation due to the increase in capacity of the aggregate rotary dryer:

D.1.1 Particulate Matter **[326 IAC 6-1-8.1(d)] [326 IAC 6-3]**
Pursuant to 326 IAC ~~6-3 (Process Operations)~~ **326 IAC 6-1-8.1(d)**, the particulate matter emissions from the mixing and drying operation shall be limited to **0.22 grains per dry standard cubic foot and to 19.10 tons particulate matter (PM) per year (equivalent to** ~~53.1~~ **4.36** pounds per hour**)**. This limit will also satisfy the requirements of **326 IAC 6-3 (Process Operations) and** 326 IAC 2-2 (Prevention of Significant Deterioration).

4. Condition D.1.1a "Hot Mix Asphalt Production Limit" has been added to the permit as follows to limit the dryer capacity to 150 tons per hour:

**D.1.1a Hot Mix Asphalt Production Limit**
**The one (1) aggregate rotary dryer shall be limited to 150 tons per hour. The Permittee shall record the hours of plant operation per day and the total asphalt production per day. The average production per hour for each day shall not exceed 150 tons per hour.**

5. Condition D.1.4 "Testing Requirements" has been changed to be as follows to move up the date of the testing requirements because of the increase in dryer capacity:

D.1.4 Particulate Matter
~~During the period between 30 and 36 months after issuance of this permit~~ **Within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up of the new production capacity**, the Permittee shall perform PM and PM-10 testing utilizing Methods 5 or 17, per 40 CFR Part 60 Appendix A, and Methods 201 or 201a and Method 202, per 40 CFR Part 51 Appendix M, or as approved by the Commissioner. This test shall be repeated at least once every five years from the date of this valid compliance demonstration. PM-10 includes filterable and condensible PM-10. **In addition to these requirements, IDEM may require compliance testing when necessary to determine if the facility is in compliance.**

6. Condition D.1.14 "Quarterly Reporting" has been changed to be as follows to report the monthly average tons per hour drying production to show compliance with the 150 tons per hour aggregate dryer limit:

D.1.14 Quarterly Reporting
A quarterly summary to document compliance with operation condition number D.1.3 **and Condition D.1.1a** shall be submitted, to the address listed in Section C.20 - General Reporting Requirements, using the enclosed forms or their equivalent, within thirty (30) days after the end of the quarter being reported.

7. A new quarterly report to show compliance with Condition D.1.1a "Hot Mix Asphalt Production Limits" has been added to the end of the permit.

# Indiana Department of Environmental Management
# Office of Air Management

Addendum to the Technical Support Document for the
Significant Modification to the Federally Enforceable State
Operating Permit (FESOP) and Enhanced New Source Review (ENSR)

| | |
|---|---|
| **Source Name:** | Paul H. Rohe Company, Inc. |
| **Source Location:** | 3919 East Laughery Creek Road, Aurora, Indiana 47001 |
| **County:** | Dearborn |
| **SIC Code:** | 2951 |
| **Significant Modification No.:** | SMF 029-9881-03187 |
| **Operation Permit No.:** | F029-7416-03187 |
| **Permit Reviewer:** | Catherine Moore |

On August 6, 1998, the Office of Air Management (OAM) had a notice published in the Dearborn County Register, Lawrenceburg, Indiana, stating that Paul H. Rohe Company, Inc. had applied for a Significant Modification to the Federally Enforceable State Operating Permit (FESOP) for a stationary hot mix asphalt batch plant. The notice also stated that OAM proposed to issue a permit for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

Upon further review, OAM has made the following changes to the final Significant Modification to the Federally Enforceable State Operating Permit (FESOP) (~~strikeout~~ added to show what was deleted and **bold** added to show what was added):

1. Condition A.2(b) “Emission Units and Pollution Control Equipment Summary” has been changed to be as follows:

   (b) one (1) enclosed mixing and batching tower with a maximum capacity of ~~120~~ **150** tons per hour;

2. The equipment listed in Section D.1 “FACILITY OPERATION CONDITIONS” has been changed to be as follows:

(b) one (1) enclosed mixing and batching tower with a maximum capacity of ~~120~~ **150** tons per hour;

Mail to: Permit Administration & Development Section
Office Of Air Management
100 North Senate Avenue
P. O. Box 6015
Indianapolis, Indiana 46206-6015

Paul H. Rohe Company, Inc.
P.O. Box 67
Aurora, Indiana 47001

**Affidavit of Construction**

I, _____, being duly sworn upon my oath, depose and say:
(Name of the Authorized Representative)

1. I live in _____ County, Indiana and being of sound mind and over twenty-one (21) years of age, I am competent to give this affidavit.

2. I hold the position of _____ for _____.
(Title) (Company Name)

3. By virtue of my position with _____,I have personal
(Company Name)
knowledge of the representations contained in this affidavit and am authorized to make these representations on behalf of _____.
(Company Name)

4. I hereby certify that Paul H. Rohe Company, Inc., 3919 East Laughery Creek Road, Aurora, Indiana, 47001, has modified the aggregate rotary dryer in conformity with the requirements and intent of the Significant Modification to the Federally Enforceable State Operating Permit (FESOP) application received by the Office of Air Management on June 22, 1998 and as permitted pursuant to **Significant Modification to the Federally Enforceable State Operating Permit (FESOP)** issued on _____

5. Additional (?operations/facilities) were constructed/substituted as described in the attachment to this document and were not made in accordance with the construction permit. (Delete this statement if it does not apply.)

Further Affiant said not.

I affirm under penalties of perjury that the representations contained in this affidavit are true, to the best of my information and belief.

_____
Signature

_____
Date

STATE OF INDIANA)
)SS
COUNTY OF _____ )

Subscribed and sworn to me, a notary public in and for _____ County and State of Indiana on this _____ day of _____, 19 _____ .

My Commission expires: _____

_____
Signature

_____
Name (typed or printed)

| | |
|---|---|
| Company Name: | Paul H. Rohe Company, Inc. |
| Plant Location: | 3919 E. Laughery Creek Road, Aurora, Indiana 47001 |
| County: | Dearborn |
| Date Received: | June 30, 1998 |
| Permit Reviewer: | Catherine Moore |

**** aggregate dryer burner****

The following calculations determine the amount of emissions created by the combustion of #2 distillate fuel oil @ 0.49 % sulfur, from the aggregate dryer burner, based on 8,760 hours of use and US EPA's AP-42, 5th Edition, Section 1.3 - Fuel Oil Combustion, Tables 1.3-2, 1.3-4, and 1.3-7.

**Criteria Pollutant:** 33.12 MMBtu/hr * 8,760 hr/yr / 138,000 Btu/gal * 2,000 lb/ton * Ef (lb/1,000 gal) = (ton/yr)

| | | | |
|---|---|---|---|
| **P M:** | 2.0 lb/1000 gal = | **2.10** | **ton/yr** |
| **P M-10:** | 1.0 lb/1000 gal = | **1.05** | **ton/yr** |
| **S O 2:** | 69.6 lb/1000 gal = | **73.14** | **ton/yr** |
| **N O x:** | 20.0 lb/1000 gal = | **21.02** | **ton/yr** |
| **V O C:** | 0.20 lb/1000 gal = | **0.21** | **ton/yr** |
| **C O:** | 5.0 lb/1000 gal = | **5.26** | **ton/yr** |

*** * aggregate drying: batch-mix plant * ***

The following calculations determine the amount of worst case emissions created by aggregate drying before controls, based on 8,760 hours of use and USEPA's AP-42, 5th Edition, Section 11.1 - Hot Mix Asphalt Plants, Tables 11.1-2 and 11.1-9 for an oil fired batch mix dryer:

Pollutant: Ef lb/ton x 150 / 2,000 ton/hr x 8,760 hr/yr

**Criteria Pollutant:**

| | | | |
|---|---|---|---|
| **P M:** | 32 lb/ton = | **21,024.00** | **ton/yr** |
| **P M-10:** | 4.5 lb/ton = | **2,956.50** | **ton/yr** |
| **VOC:** | 0.003421 lb/ton = | **2.25** | **ton/yr** |

The VOC emission factor represents the sum of the HAP emission factors from the dryer which were assumed to be VOC.

*** * conveying / handling * ***

The following calculations determine the amount of emissions created by wet (>1.5% moisture) material handling, based on 8,760 hours of use and AP-42, Section 11.19.2, Table 11.19.2-2. Emission factors for process operations are as follows:

PM-10 Emissions Per Operation:

150 / 2,000 ton/hr * 8,760 hrs/yr * Ef (lb/ton of material) * Number of Similar Operations = (ton/yr)

| Operation | | | | | |
|---|---|---|---|---|---|
| Truck Loading: | 1 operation(s) x | 1.0E-04 | lb/ton of material = | 0.07 | ton/yr |
| Conveyor Transfers: | 2 operation(s) x | 4.8E-05 | lb/ton of material = | 0.06 | ton/yr |

| | | |
|---|---|---|
| **Total PM 10 Emissions:** | **0.13** | **ton/yr** |
| **Total PM Emissions:** | **0.27** | **ton/yr** |

Total PM Emissions (tons/yr) = 2.1 * Total PM-10 Emissions (tons/yr) based on US EPA's AP-42, 5th Edition, Section 11.19.2, Table 11.19.2-2, footnote c.

*** * unpaved roads * ***

The following calculations determine the amount of emissions created by vehicle traffic on unpaved roads, based on 8,760 hours of use and AP-42, Ch 11.2.1.

I. Tandem Axle Trucks

| | | | | |
|---|---|---|---|---|
| 8.5 | trip/hr x | | | |
| 0.13 | mile/trip x | | | |
| 2 | (round trip ) x | | | |
| 8,760 | hr/yr = | | 19359.6 | miles per year |

| | | |
|---|---|---|
| Ef = | k*5.9*(s/12)*(S/30)*(W/3)^0.7*(w/4)^0.5*((365-p)/365) | |
| = | 3.44 | lb/mile |
| where k = | 0.8 | (particle size multiplier) |
| s = | 4.8 | % silt content of unpaved roads |
| p = | 125 | days of rain greater than or equal to 0.01 inches |
| S = | 15 | miles/hr vehicle speed |
| W = | 18 | tons average vehicle weight |
| w = | 10 | wheels |

PM: 3.44 lb/mi x 19359.6 mi/yr = 33.30 tons/yr
2000 lb/ton

P M-10: 35% of PM = 11.65 tons/yr

II. Front End Loader

| | | | | |
|---|---|---|---|---|
| 17.1 | trip/hr x | | | |
| 0.05 | mile/trip x | | | |
| 2 | (round trip ) x | | | |
| 8,760 | hr/yr = | | 14979.6 | miles per year |

| | | |
|---|---|---|
| Ef = | k*5.9*(s/12)*(S/30)*(W/3)^0.7*(w/4)^0.5*((365-p)/365) | |
| = | 2.00 | lb/mile |
| where k = | 0.8 | (particle size multiplier) |
| s = | 4.8 | % silt content of unpaved roads |
| p = | 125 | days of rain greater than or equal to 0.01 inches |
| S = | 10 | miles/hr vehicle speed |
| W = | 29 | tons average vehicle weight |
| w = | 4 | wheels |

PM: 2.00 lb/mi x 14979.6 mi/yr = 14.99 tons/yr
2000 lb/ton

P M-10: 35% of PM = 5.24 tons/yr

**Total PM Emissions From Unpaved Roads = 48.28 tons/yr**

**Total PM-10 Emissions From Unpaved Roads = 16.90 tons/yr**

*** * storage * ***

The following calculations determine the amount of emissions created by wind erosion of storage stockpiles, based on 8,760 hours of use and USEPA's AP-42 (Pre 1983 Edition), Section 11.2.3.

| Material | Silt Content (wt %) | Pile Size (acres) | Storage Capacity (tons) | P M Emissions tons/yr | P M-10 Emissions tons/yr |
|---|---|---|---|---|---|
| Sand | 1.1 | 0.90 | 20,000 | 0.21 | 0.07 |
| Gravel | 0.8 | 0.90 | 20,000 | 0.15 | 0.05 |
| RAP | 1.3 | 0.90 | 20,000 | 0.25 | 0.09 |
| **Total** | | | | **0.61** | **0.21** |

Sample Calculation:

Ef = 1.7*(s/1.5)*(365-p)/235*(f/15)
= 1.27 lb/acre/day
where s = 1.1 % silt
p = 125 days of rain greater than or equal to 0.01 inches
f = 15 % of wind greater than or equal to 12 mph

Ep (storage) = Ef * (365 day/yr) * (pile size in acres) / (2,000 lb/ton)

**PM = 0.21 tons/yr** **P M-10:** 35% of PM = **0.07 tons/yr**

*** * summary of source emissions before controls * ***

Criteria Pollutants:

| | | |
|---|---|---|
| **P M:** | **21,075.27 ton/yr** | |
| **P M-10:** | **2,974.79 ton/yr** | |
| **S O 2:** | **73.14 ton/yr** | |
| **N O x:** | **21.02 ton/yr** | |
| **V O C:** | **2.46 ton/yr** | (VOCs include HAPs from aggregate drying operation) |
| **C O:** | **5.26 ton/yr** | |

*** * source emissions after controls * ***

Particulate emissions from the aggregate drying operation are controlled by a cyclone and baghouse with a control efficiency of 99.976 %

| | | | | | | |
|---|---|---|---|---|---|---|
| | aggregate drying: | | nonfugitive | | | |
| **P M:** | 21,026.10 | ton/yr x | 0.024% | emitted after controls = | **5.05** | **ton/yr** |
| **P M-10:** | 2,957.55 | ton/yr x | 0.024% | emitted after controls = | **0.71** | **ton/yr** |
| | bin loading & conveying: | | fugitive | | | |
| **P M:** | 0.27 | ton/yr x | 50% | emitted after controls = | **0.14** | **ton/yr** |
| **P M-10:** | 0.13 | ton/yr x | 50% | emitted after controls = | **0.06** | **ton/yr** |
| | unpaved roads: | | fugitive | | | |
| **P M:** | 48.28 | ton/yr x | 50% | emitted after controls = | **24.14** | **ton/yr** |
| **P M-10:** | 16.90 | ton/yr x | 50% | emitted after controls = | **8.45** | **ton/yr** |
| | storage piles: | | fugitive | | | |
| **P M:** | 0.61 | ton/yr x | 50% | emitted after controls = | **0.30** | **ton/yr** |
| **P M-10:** | 0.21 | ton/yr x | 50% | emitted after controls = | **0.11** | **ton/yr** |

*** * summary of source emissions after controls * ***

| **Criteria Pollutant:** | **Non-Fugitive** | **Fugitive** | **Total** |
|---|---|---|---|
| **P M:** | **5.05 ton/yr** | **24.58 ton/yr** | **29.63 ton/yr** |
| **P M-10:** | **0.71 ton/yr** | **8.62 ton/yr** | **9.33 ton/yr** |
| **S O 2:** | **73.14 ton/yr** | **0.00 ton/yr** | **73.14 ton/yr** |
| **N O x:** | **21.02 ton/yr** | **0.00 ton/yr** | **21.02 ton/yr** |
| **V O C:** | **2.46 ton/yr** | **0.00 ton/yr** | **2.46 ton/yr** |
| **C O:** | **5.26 ton/yr** | **0.00 ton/yr** | **5.26 ton/yr** |

*** * miscellaneous * ***

**326 IAC 7 Compliance Calculations:**

The following calculations determine the maximum sulfur content of distillate fuel oil allowable by 326 IAC 7:

0.5 lb/MMBtu x 138,000 Btu/gal= 69 lb/1000gal

69 lb/1000gal / 142 lb/1000 gal = 0.49 %

Sulfur content must be less than or equal to 0.49% to comply with 326 IAC 7.

**326 IAC 6-3-2 Compliance Calculations:**

The following calculations determine compliance with 326 IAC 6-3-2 for process weight rates in excess of 30 tons per hour:

limit = 55 * ( 150 ^ 0.11 ) - 40 = 55.44 lb/hr or 242.83 ton/yr

PM emissions from the aggregate dryer are controlled to 5.05 tons/yr < 242.83 tons/yr (Will comply)

**PM-10 Emission Limit:**

(99.0 tons PM-10/yr - 8.61 tons PM-10/yr from other souces)
= 90.4 tons PM-10/yr = 20.64 lbs/hr
PM-10 emissions from the aggregate dryer are controlled to 0.71 tons/yr < 90.4 tons/yr (Will comply)

**40 CFR Part 60.90, Subpart I (Standards of Performance for Hot Mix Asphalt Plants) Compliance Calculations:**

The following calculations determine compliance with NSPS (Subpart I), which limits stack emissions from asphalt plants to 0.04 gr/dscf:

$$\frac{0.04 \text{ grain}}{\text{dscf}} * 32326 \text{ acfm} * \frac{528}{460 + 250 \text{ Temp}} * \frac{100 - 6 \text{ \% moisture}}{100} * 525600 \frac{\text{minute}}{\text{year}} * \frac{1}{7000 \text{ grain}} * \frac{1 \text{ ton}}{2000 \text{ lb}} = 33.93 \frac{\text{tons}}{\text{year}}$$

PM emissions from the aggregate dryer are controlled to 5.05 tons/yr < 33.93 tons/yr (Will comply)

**326 IAC 6-1-2(a) (Particulate Emission Limitations)**

The following calculations determine compliance with 326 IAC 6-1-2(a), which limits stack emissions from asphalt plants to 0.03 gr/dscf:

$$\frac{0.03 \text{ grain}}{\text{dscf}} * 32326 \text{ acfm} * \frac{528}{460 + 250 \text{ Temp}} * \frac{100 - 6 \text{ \% moisture}}{100} * 525600 \frac{\text{minute}}{\text{year}} * \frac{1}{7000 \text{ grain}} * \frac{1 \text{ ton}}{2000 \text{ lb}} = 25.45 \frac{\text{tons}}{\text{year}}$$

## Hazardous Air Pollutants (HAPs)

### ** aggregate dryer burner**

The following calculations determine the amount of HAP emissions created by the combustion of distillate fuel oil before & after controls @ 0.49 % sulfur, from the aggregate dryer burner, based on 8760 hours of use and US EPA's AP-42, 5th Edition, Section 1.3 - Fuel Oil Combustion, Table 1.3-11.

Hazardous Air Pollutants (HAPs): 33.12 MMBtu/hr * 8760 hr/yr / 2,000 lb/ton  * Ef (lb/10^12 Btu) = (ton/yr)

| | | | Potential To Emit | Limited Emissions |
|---|---|---|---|---|
| **Arsenic** | 4.2 | lb/10^12 Btu = | 6.09E-04 ton/yr | 1.46E-07 ton/yr |
| **Beryllium:** | 2.5 | lb/10^12 Btu = | 3.63E-04 ton/yr | 8.70E-08 ton/yr |
| **Cadmium:** | 11 | lb/10^12 Btu = | 1.60E-03 ton/yr | 3.83E-07 ton/yr |
| **Chromium:** | 67 | lb/10^12 Btu = | 9.72E-03 ton/yr | 2.33E-06 ton/yr |
| **Lead:** | 8.9 | lb/10^12 Btu = | 1.29E-03 ton/yr | 3.10E-07 ton/yr |
| **Manganese:** | 14 | lb/10^12 Btu = | 2.03E-03 ton/yr | 4.87E-07 ton/yr |
| **Mercury:** | 3 | lb/10^12 Btu = | 4.35E-04 ton/yr | 1.04E-07 ton/yr |
| **Nickel:** | 170 | lb/10^12 Btu = | 2.47E-02 ton/yr | 5.92E-06 ton/yr |
| | | Total HAPs = | 4.07E-02 ton/yr | 9.77E-06 ton/yr |

### * * aggregate drying: batch-mix plant * *

The following calculations determine the amount of HAP emissions created by aggregate drying before & after controls, based on 8,760 hours of use and USEPA's AP-42, 5th Edition, Section 11.1 - Hot Mix Asphalt Plants, Table 11.1-9 for a fuel oil fired batch mix dryer. The HAP emission factors are for an oil fired dryer.

Pollutant: Ef lb/ton x 150 / 2000 lb/ton x ton/hr x 8760 hr/yr

| Hazardous Air Pollutants (HAPs): | | | Potential To Emit | Limited Emissions |
|---|---|---|---|---|
| **Formaldehyde:** | 3.20E-03 | lb/ton = | 2.10 ton/yr | 2.10 ton/yr |
| **Total Polycyclic Organic Matter (POM):** | 2.210E-04 | lb/ton = | 0.15 ton/yr | 0.15 ton/yr |
| | | Total HAPs = | 2.25 ton/yr | 2.25 ton/yr |

** total POM includes 2-Methylnapthalene, Fluoranthene, Naphthalene, Phenanthrene, and Pyrene.

*** * summary of source HAP emissions potential to emit * ***

Hazardous Air Pollutants (HAPs):

| | | |
|---|---|---|
| Arsenic: | **0.001** | ton/yr |
| Beryllium: | **0.000** | ton/yr |
| Cadmium: | **0.002** | ton/yr |
| Chromium: | **0.010** | ton/yr |
| Formaldehyde: | **2.102** | ton/yr |
| Lead: | **0.001** | ton/yr |
| Manganese: | **0.002** | ton/yr |
| Mercury: | **0.000** | ton/yr |
| Nickel: | **0.025** | ton/yr |
| Total POM: | **0.145** | ton/yr |
| **Total:** | **2.288** | **ton/yr** |

*** * summary of source HAP limited emissions * ***

Hazardous Air Pollutants (HAPs):

| | | |
|---|---|---|
| Arsenic: | **0.000** | ton/yr |
| Beryllium: | **0.000** | ton/yr |
| Cadmium: | **0.000** | ton/yr |
| Chromium: | **0.000** | ton/yr |
| Formaldehyde: | **2.102** | ton/yr |
| Lead: | **0.000** | ton/yr |
| Manganese: | **0.000** | ton/yr |
| Mercury: | **0.000** | ton/yr |
| Nickel: | **0.000** | ton/yr |
| Total Polycyclic Organic Matter: | **0.145** | ton/yr |
| **Total:** | **2.248** | **ton/yr** |