Statement of Basis

Permit to Construct P-2010.0060
Project No. 60565

LeGrand Johnson Construction Co.
Portable Facility

Facility ID No. 777-00054

Final Permit

December 1, 2010
Carole Zundel
Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscfm	dry standard cubic feet per minute
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
gph	gallons per hour
gr/dscf	grains (1 lb = 7,000 grains) per dry standard cubic foot
HAP	hazardous air pollutants
HMA	hot mix asphalt
hp	horsepower
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
m	meters
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
PERF	Portable Equipment Relocation Form
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
RAP	recycled asphalt pavement
Rules	Rules for the Control of Air Pollution in Idaho
SM	synthetic minor
SO_2	sulfur dioxide
T/yr	tons per consecutive 12-calendar month period
TAP	toxic air pollutants
VOC	volatile organic compounds

FACILITY INFORMATION

Description

Gravel trucks pile various sizes of aggregate as well as recycled asphalt near the asphalt plant site. Aggregate is loaded via front-end loader into a hopper which feeds the conveyor feeding the burner end of the oil fired drum mixer. Recycled asphalt concrete is loaded via front-end loader into a hopper which feeds the conveyor feeding halfway down the drum. Heated asphalt oil is fed into the drum mixer at the opposite end from the burner where it mixes with the raw aggregate and recycled asphalt concrete. The product is then conveyed to heated storage bins. From the bins, the product is then transferred to trucks which transport the material offsite.

Power for the process will be provided by diesel generators.

Permitting History

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

May 6, 1991	777-00054, PTC for HMA, Permit status A, but will become S upon issuance of this permit.

Application Scope

This PTC is for a minor modification at an existing minor facility.

The applicant has proposed to:

- Install and operate a baghouse
- Install and operate two diesel generators

Application Chronology

April 26, 2010	DEQ received an application and an application fee.
May 12, 2010	DEQ determined that the application was incomplete.
June 11, 2010	Applicant requested a one-week extension to complete the incompleteness items
June 11, 2010	DEQ grants one week extension
June 21, 2010	DEQ receives applicant's request to withdraw application
June 22, 2010	DEQ sends acknowledgement letter for application withdrawal
September 7, 2010	DEQ received revised application
October 1, 2010	DEQ determined that the application was complete.
September 20–October 5, 2010	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
October 15, 2010	DEQ made available the draft permit and statement of basis for peer and regional office review.
October 21, 2010	DEQ made available the draft permit and statement of basis for applicant review.
November 16, 2010	DEQ received the permit processing fee.

TECHNICAL ANALYSIS

Emissions Units and Control Devices

Table 1 EMISSIONS UNIT AND CONTROL DEVICE INFORMATION

Source Description	Control Equipment Description
Cedar Rapids 8835 Asphalt Plant Drum mix 350 TPH 400,000 TPY Fuel: Used oil, #2 fuel oil Max fuel usage: 525 gph	Pulse jet baghouse Manufacturer: Astec Industries, Inc. Model: Port Pulse-Jet Equipment ID: PBH-56-17.5 Flow rate: 26,273 DSCFM
Diesel generator 75 kW John Deere Port Diesel Generator (Night Standby) Model year: 1981 Rated fuel consumption rate: 6 gph Sulfur in fuel, wt %: 0.05	None
Diesel generator 800 kW CAT Port Diesel Powered Engine D399TA Model year: 1976 Rated fuel consumption rate: 56 gph Sulfur in fuel, wt. %: 0.05	None
Asphalt tank heater Fuel type: #2 fuel oil Max fuel usage rate: 14 gph Rate: 2.82 MMBtu	None
Asphalt tank heater Fuel type: #2 fuel oil Max fuel usage rate: 7.2 gph Rate: 1 MMBtu, 0.75 HP	None

Emissions Inventories

An emission inventory was developed for the drum mix asphalt plant, two generators, and two asphalt tank heaters at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant PTE were based on emission factors from AP-42 and process information specific to the facility for this proposed project. Summaries of the estimated controlled emissions of criteria pollutants, TAPs, and HAPs from the facility are provided in the following tables.

The following table presents the potential to emit for criteria pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 POTENTIAL TO EMIT FOR CRITERIA POLLUTANTS

Emissions Unit	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr	T/yr
Point Sources												
Drum mix	8.05	4.6	3.85	2.2	19.25	11.00	45.5	26.00	11.2	6.4	0.00525	0.003
Asphalt tank heater	0.0679	0.0679	0.146	0.146	0.412	0.412	0.232	0.232	0.0152	0.0152	0.0000311	0.0000311
Engines	0.562	1.687	0.419	1.258	13.7	41.204	8.29	24.868	1.07	3.21	0.00	0.00
Load-out and silo filling	0.388	0.222	0.00	0.00	0.00	0.00	0.885	0.506	0.00	0.806	0	0
Totals	9.07	6.58	4.42	3.60	33.36	52.62	54.91	51.61	12.29	10.43	0.01	0.00

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Based on a baghouse efficiency of at least 99% and on the drum mix estimated controlled emissions of 4.6 tons per year, this facility is estimated to have an uncontrolled potential to emit for PM_{10} emissions greater than the Major Source threshold of 100 T/yr and a controlled potential to emit for PM_{10}, VOC, SO_2, NO_x, and CO emissions less than the Major Source threshold of 100 T/yr. Therefore, this facility is designated as a Synthetic Minor facility. As demonstrated in Table 2, the facility's PTE for all criteria pollutants is less than 80% of the Major Source thresholds of 100 T/yr. Therefore, this facility will not be designated as a SM-80 facility.

TAP Emissions

A summary of the estimated uncontrolled and controlled emissions increase of toxic air pollutants (TAP) is provided in the appendix of this SOB. Some of the estimated emissions of TAP exceeded applicable emissions screening levels (EL) and have been modeled to assess compliance with IDAPA 58.01.01.585 and 586 levels.

HAP Emissions

Appendix A presents the potential to emit for HAP pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. The total HAP estimated emissions are 2.21 tons per year.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of PM_{10}, SO_2, NO_X, CO, and VOC demonstrated compliance with the NAAQS (National Ambient Air Quality Standards). Some of the TAPs from this project exceeded applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAPs is provided in Appendix B.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

Because a separate modeling analysis was not provided to demonstrate compliance with applicable standards in nonattainment areas, this portable facility is not permitted for operation in nonattainment areas.

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the modified emissions source. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 Tier II Operating Permit

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[1] Criteria pollutant thresholds in Table 1, State of Idaho Air Quality Modeling Guideline, Doc ID AQ-011, rev. 1, December 31, 2002.

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 Visible Emissions

The sources of PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assessed by a permit condition to conduct visible emissions inspections and a permit condition to record the results of those inspections.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for PM_{10}, SO_2, NO_X, CO, and VOC or 10 tons per year for any one HAP or 25 tons per year for all HAPs combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006.113 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

The facility is subject to 40 CFR 60 Subparts A and I. Authority has been delegated to DEQ by EPA to implement and enforce these Subparts as of July 11, 2007 and for the purposes of these subparts "Administrator" includes "DEQ."

Subpart A

40 CFR 60, Subpart A General Provisions

40 CFR 60.1 Applicability

In accordance with 40 CFR 60.1(a), the provisions of this part apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication in this part of any standard.

Subpart I

40 CFR 60, Subpart I Standards of Performance for Hot Mix Asphalt Facilities

40 CFR 60.90 Applicability and designation of affected facility

In accordance with §60.90(a), each hot mix asphalt facility that commences construction or modification after June 11, 1973 is an affected facility and is subject to the requirements of 40 CFR 60 Subpart I.

An affected facility subject to this subpart includes the following: a drum mixer; 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.

This HMA plant was constructed in 1984, which is after June 11, 1973. Therefore, it is an affected facility.

§ 60.92 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by §60.8 is completed, no owner or operator subject to the provisions of this subpart shall discharge or cause the discharge into the atmosphere from any affected facility any gases which:

(1) Contain particulate matter in excess of 90 mg/dscm (0.04 gr/dscf).

(2) Exhibit 20 percent opacity, or greater.

These requirements were written as permit conditions in the permit.

Subpart Kb

40 CFR 60, Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984

Applicability Summary:

The application did not include any tanks to which this regulation would be applicable. Specifically, the applicant will not have onsite tanks that would trigger Subpart Kb. This means that:

- The capacity of any tank storing fuel oil at this facility shall be less than 39,890 gallons.
- The capacity of any tank storing gaseous fuels shall be less than 19,813 gallons, or the tank must be designed to operate in excess of 29.7 psi and without emissions to the atmosphere.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT Applicability (40 CFR 63)

The facility has proposed to operate as an area source of hazardous air pollutant (HAP) emissions, and is subject to the requirements of 40 CFR 63, Subpart ZZZZ–National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

§ 63.6580 What is the purpose of subpart ZZZZ?

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

§ 63.6585 Am I subject to this subpart?

You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

The facility operates two RICE at an area source of HAP emissions. Therefore, they are subject to this subpart.

§ 63.6590(a)(1)(iii) For stationary RICE located at an area source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

The 75 KW diesel generator was constructed in 1981 and the 800 KW diesel generator was constructed in 1976. Therefore, both generators are existing.

§ 63.6595 (a) *Affected sources.*

(1) If you have an existing stationary RICE, excluding existing non-emergency CI stationary RICE, with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than June 15, 2007. If you have an existing non-emergency CI stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, an existing stationary CI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or ***an existing stationary CI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than May 3, 2013.*** *If you have an existing stationary SI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or an existing stationary SI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than October 19, 2013.*

These are both CI generators, so they must comply with the applicable emission limitations and operating limitations no later than May 3, 2013. Because compliance is not mandatory at the time of the writing of this permit, the requirements are not included in this permit action.

Permit Conditions Review

This section describes the permit conditions for only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Revised Permit Condition Section 1.0

This section described the process and the equipment specifications. This has been replaced by Table 1 and Permit Condition 5 and incorporates the proposed equipment changes.

Revised Permit Condition 2.1

The emissions limits in this permit condition have been replaced or eliminated. The emissions limits are currently based on AP-42 estimates and on the new equipment that will be installed. Because many of the pollutants are not estimated to be close to any NAAQS limits, they are not necessary to have as permitted limits and were therefore eliminated.

The visible emissions and the fugitive emissions limits have been reworded to match the current regulations governing these parameters.

Removed Permit Conditions 3.1 and 3.2

These permit conditions regulated the scrubber which is no longer used. It has been replaced by a baghouse. The baghouse permit conditions are described later in this SOB.

Revised Permit Condition 3.4

The performance testing requirement has been updated to be more specific about the frequency, test methods, and the pollutants that are required to be tested.

Revised Permit Condition 3.5

The fugitive dust monitoring permit condition has been updated to apply to the entire facility and to be more specific about monitoring the emissions and taking corrective action as required by the rules.

Revised Permit Condition 4.1

The production limit has remained the same, and has in addition been limited on a daily and annual basis. The limit on the temperature of the drum has been removed because the current emission estimates are independent of temperature, so there is no reason to have a temperature limit in the permit any more.

Removed Permit Condition 4.2

The limit on the hours of operation is no longer needed because the emissions are now based on production, independent of time.

Removed Permit Conditions 4.3 and 4.4

These permit conditions regulated the operation of the scrubber, which is no longer in use.

Removed Permit Condition 4.5

Additional fuel types are now allowed, so this limitation has been removed (to fire on only #2 fuel oil).

Removed Permit Condition 4.6

The current emission estimates are not dependent on the temperature of the asphalt oil tank, so this limitation has been removed.

Removed Permit Condition 5.1

This permit condition is for the testing of the venturi scrubber, which is no longer used as the facility, so the permit condition has been removed.

Removed Permit Condition 5.2

This permit condition requires tracking of the hours of operation. Hours of operation are no longer limited in this permit.

Revised Permit Condition 5.3

This permit condition requires notification of relocation. The permit condition has been revised and now requires the completion of a standard relocation form, which contains more information than is required in the original permit condition.

Removed Permit Condition 5.4

This permit condition required special permission prior to relocating in a non-attainment area. The new permit does not allow relocation to a non-attainment area. A permit application and revised permit is required prior to any relocation to a non-attainment area.

New Permit Conditions 6-12

These permit conditions limit the fuel types and specifications to the ones that were identified in the application.

New Permit Condition 13

This documentation is to assess compliance with the fuel type and sulfur content limitations in this permit.

New Permit Condition 14

This documentation is to assess compliance with the used oil limitation. The intent of this condition is that the supplier documentation normally contains all of this information.

New Permit Condition 15

This permit condition requires compliance with IDAPA 58.01.01.625.

New Permit Condition 16

This permit condition requires monitoring of the sources of the point sources, taking corrective action if non-compliant visible emissions are observed, and recording the results of the actions.

New Permit Conditions 17 through 19

Incorporates the requirements of IDAPA 58.01.01.650-51 and 808 for control of fugitive emissions. Two specific areas are identified to clarify how the rule applies to these areas. The controls are required to be monitored and the actions taken recorded.

New Permit Condition 20

The odor rule is applicable and is quoted.

New Permit Condition 21

The permittee shall maintain records of all odor complaints received. The permittee shall take appropriate corrective action as expeditiously as practicable. The records shall include, at a minimum, the date each complaint was received and a description of the following: the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

New Permit Condition 22

The open burning rule is quoted.

New Permit Condition 23

The facility emissions have not been modeled to allow operation in any non-attainment area. Therefore, operation in a non-attainment area is not allowed.

New Permit Condition 24-26

Modeling has not demonstrated compliance with co-locating this source with any other except a rock crusher, and there are requirements when operating with a rock crusher. There is a requirement that the permittee shall measure the distance each time the equipment is moved. This is to ensure that the setback limitations are met.

New Permit Condition 27

When the facility relocates, a PERF is required to be sent in to DEQ.

New Permit Condition 28

Refers to the general provisions for recordkeeping.

New Permit Condition 29

This condition specifies the EPA method to use for any testing done at the facility.

New Permit Condition 30

This condition requires that, when applicable, the testing must be done according to the applicable federal regulation and the reference general provisions in this permit. If that federal regulation does not require the test that is being done, then this permit condition requires compliance with only the general provisions.

New Permit Condition 31

This is the Subpart A from the federal general provisions, which may apply to the testing that is being performed.

New Permit Condition 32

This incorporates the federal regulations into the permit by reference.

New Permit Condition 33

This is so that if the federal regulation changes or is not quoted correctly, the permit states that the federal rule still applies as written in the Code of Federal Regulations.

New Permit Condition 34

This identifies that a baghouse is used to control emissions from the drum mixer.

New Permit Condition 35

This quotes the federal regulation limiting particulate and visible emissions.

New Permit Condition 36

This is the AP-42-derived PM_{10} emissions estimate which was used in modeling to demonstrate compliance with the NAAQS for PM_{10} and to establish a setback distance.

New Permit Condition 37

The materials listed in the permit application are listed in the permit. Emissions have been estimated and analyses based on this material.

The material is limited to 50% RAP because AP-42 factors were used to estimate emissions, and according to AP-42 section 11.1, *"RAP is mixed in a zone removed from the exhaust gas stream, counter-flow drum mix plants will likely have organic emissions (gaseous and liquid aerosol) that are lower than parallel flow drum mix plants. However, the available data are insufficient to discern any differences in emissions that result from differences in the two processes. A counter-flow drum mix plant can normally process RAP at ratios up to 50 percent with little or no observed effect upon emissions."*

New Permit Condition 38

This requires that a baghouse be installed and operated to control particulate emissions from the HMA drum mixer. To prevent the dust collected from being dumped on the ground, it is required to use the common method of recycling the dust into the HMA mix.

New Permit Condition 39

The production rates are based on the information presented in the application. Emissions were estimated and modeled using these values.

The facility requested operation of 10 hours per day on Page 1 of the application, and at 350 tons per hour, is 3,500 tons per day. After modeling determined the setback, the facility requested a lower daily throughput limit of 2,500 tons per day, which is shown in the modeling spreadsheet calculations.

The permit also has a provision for operating at a higher rate, 5,000 tons per day, if a different setback is used.

The table shows different scenarios with corresponding required setback limits.

New Permit Condition 40

This is to assess compliance with the RAP 50% limit.

New Permit Condition 41

This is to assess compliance with the production limits.

New Permit Condition 42

This is to assess compliance with the setback requirements.

New Permit Conditions 43 and 44

Because the setback distances are limited by the particulate emitted, it is necessary to ensure that the particulate emissions are not in excess of what was estimated in the application. Also, routine checks are needed to ensure that the NSPS particulate level and visible emissions are not exceeded.

New Permit Condition 45

This requires that the testing be done in accordance with the general provisions. Also, it is required that the amount of HMA produced and the amount of RAP used be recorded to ensure that the test is representative of worst-case normal operations.

New Permit Condition 46

Instructions for test reporting.

New Permit Condition 47

Specifies details about preparing an O&M manual that is to be followed to maintain the baghouse for proper operation.

New Permit Condition 48

Describes that generators are used to supply power to the facility.

New Permit Condition 49

Provides details about the two generators that have been permitted for use at the facility and what fuels are allowed to be used.

New Permit Condition 50

The generator emission estimates that were evaluated are based on limited operating hours, so the hours are limited.

New Permit Condition 51

This requires tracking of the hours to assess compliance with the limits on hours of operation.

Initial Permit Condition 52

The duty to comply general compliance provision requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

Initial Permit Condition 53

The maintenance and operation general compliance provision requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

Initial Permit Condition 54

The obligation to comply general compliance provision specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

Initial Permit Condition 55

The inspection and entry provision requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

Initial Permit Condition 56

The construction and operation notification provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.

Initial Permit Condition 57

The performance testing notification of intent provision requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

Initial Permit Condition 58

The performance test protocol provision requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

Initial Permit Condition 59

The performance test report provision requires that the permittee report any performance test results to DEQ within 30 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Initial Permit Condition 60

The monitoring and recordkeeping provision requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

Initial Permit Condition 61

The excess emissions provision requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130.

Initial Permit Condition 62

The certification provision requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

Initial Permit Condition 63

The false statement provision requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

Initial Permit Condition 64

The tampering provision requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

Initial Permit Condition 65

The transferability provision specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

Initial Permit Condition 66

The severability provision specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Hot Mix Asphalt PTC Toolkit

Version 08/12/2008

Information shown in bold/color on any worksheet indicates user input for that cell. Black text (normal or bold) is calculated or hard-wired -- do not type over formulas in these cells.

These worksheets were developed to expedite processing of PTC permits for Hot Mix Asphalt (HMA) facilities that are not co-located with any other emission sources.

User Input:

Facility Data-Model Input worksheet: Input facility-specific data including contact information, equipment ratings, HMA production levels, and tank heater and Engine hours of operation. Select fuel types and Engine options as noted below.

Short term source factor for carcinogens is set to "N", i.e., No. Do not change this to Y. Do not delete cells related to this-- you will zero out carcinogenic emissions.

Using T-RACT for carcinogens is set to "N", i.e., No. Do not change this to Y. If appropriate, apply T-RACT factor of 10 to the carcinogenic ambient impact results from the modeling analysis.

Drum Mix HMA with Fabric Filter (Baghouse), either counterflow or parallel flow, fired by:

Distallate fuel oil. Default is 0.5% sulfur. User input required in "Facility Data Input" for any other sulfur content.
Used Oil/RFO4. Default is 0.5% sulfur. User input required in "Facility Data Input" for any other sulfur content.
Natural gas
LPG or propane
Facility Data Input: Input "1" (use this fuel) or "0" (don't use this fuel).
The EI summary sheets will use the highest emission for any selected fuel for each pollutant.

Asphalt Tank Heater, fired by #2 fuel oil or natural gas - operated 1/3 of the hours of the HMA

Facility Data Input: Input "1" (use this fuel) or "0" (don't use this fuel).
If line power is ALWAYS used, input "0" for each fuel.
Distallate fuel oil. Default is 0.5% sulfur. User input required in "Facility Data Input" for any other sulfur content.

Engines - operated up to 6000 hours per year

Facility Data Input: Input "1" (include Enginel) or "0" (omit Engine).
Distallate fuel oil. Default is 0.5% sulfur. User input required in "Facility Data Input" for any other sulfur content.
The EI will use Tier 2, 89.112 EFs for two engine size categories. E1 = Any combination of engines, all less than 175 hp, to a maximum of 175 bhp. E2 = Any combination of engines, all greater than 175 hp, to a maximum of 1350 hp.

Assumptions:

Emissions evaluation is based on IDAPA regulatory requirements current as of August 8, 2008
EFs are drawn from AP-42 factors available as of August 8, 2008.
Average brake-specific fuel consumption of 7000 Btu/hp-hr was assumed to convert from lb/MMBtu to lb/hp-hr.
Average diesel heating value is based on 19,300 Btu/lb with density equal 7.1 lb/gal.
AP-42 EFs for natural gas combustion (Tables 1.4-xx) are based on heat value of 1,020 Btu/scf.
Natural Gas Fuel Heating Value assumed to be 137,030 Btu/gal.
"Reasonable" AP-42 factors are used. Where factors were available in more than one AP-42 section, the estimates are based on the highest of the available factors. For example, AP-42 11.1 EFs for a tank heater burning #2 oil include no information for emissions of PM, NOx, SOx, VOCs, or lead, which is not reasonable. Criteria pollutant EFs from AP-42 1.3, Fuel Oil Combustion, are used instead, and are considered reasonable.

Fugitive Emissions: Fugitive PM emissions from storage piles are typically caused by front-end loader operations that transport the aggregate to the cold feed unit hoppers. Piles of RAP, because RAP is coated with asphalt cement, are not likely to cause significant fugitive dust problems. Aggregate moisture content prior to entry into the dryer is typically 3 percent to 7 percent. This moisture content, along with aggregate size classification, tend to minimize emissions from these sources, which contribute little to total facility PM emissions. PM10 emissions from these sources are reported to account for about 19 percent of their total PM emissions. *Source: STAPPA-ALAPCO-EPA, Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix Asphalt Plants, Final Report, July 1996. DEQ* CONCLUSION: Negligible fine PM emissions from RAP. Worst-case fugitive emissions from material handling are for 0% RAP. Assume aggregate/RAP tons = 96% of total HMA tons.

Worksheet Tabs: Letter-Number reflect Location and Order in Statement of Basis

Facility Data Input (primary worksheet for **input** of facility-specific parameters)
EmissionInventory lb/hr - Drum dryer baghouse, tank heater, Engine, silo filling, and load-out
EmissionInventory TPY - Drum dryer baghouse, tank heater, Engine, silo filling, and load-out
Values in Emission Inventories reflect the maximums ONLY from fuel types selected.
FACWIDE TAPs EIs. Use for TAPs EL screening. Includes silo/loadout fugitives.
Lb/hr emissions shown are 24-hr averages for noncarcinogens and annual averages for carcinogens.

Worksheets for Emissions based on Source and Fuel Type:

Drum Dryer Used Oil FabricFilter	Drum Dryer, fired on used oil or RF04 oil
Drum Dryer #2 Oil FabricFilter	Drum Dryer, fired on #2 fuel oil
Drum Dryer NG Fabric Filter	Drum Dryer, natural gas fired
Drum Dryer LPG or Propane FabricFilter	Drum Dryer, LPG or propane-fired
Tank Heater #2 Oil AP-42 1.3, 11.1	Asphalt Tank Heater, fired on #2 fuel oil
Tank Heater NG-AP42 11.1	Asphalt Tank Heater, natural gas fired
Tank Heater NG-AP42 1.4	Asphalt Tank Heater, natural gas fired
Engine < 600 hp (447kW)	#2 Fuel oil fired
Engine > 600 hp (447kW)	#2 Fuel oil fired
Silo Fill Operations	Fugitive emissions based on HMA throughput
Load-out Operations	Fugitive emissions based on HMA throughput

Scalping Screen & Transfer Points (Front-end Loader and Conveyors) - Input wind speeds & moisture

Criteria Pollutant Modeling	1-, 3-, 8-, 24-hour, and annual lb/hr emission rates
TAPs Modeling	24-hour, and annual lb/hr emission rates

CURRENT PTC APPLICATION ESTIMATES

DEQ Verification Worksheets: Hot Mix Asphalt (HMA) Drum Mix Facility Data

Facility ID/AIRS No.	000-00000	Spreadsheet Date	12/10/2010 10:13
Permit No.	P-2010.Generic	Spreadsheet Version	3/31/2010 klh

Facility Owner/Company Name:	T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
Address:	PORTABLE
City, State, Zip:	
Facility Contact:	
Contact Number/ e-mail:	

		Include Silo Fill & Loadout Emissions?	Y
Use Short Term Source Factor on 586 ELs? Y/N	N	Use T-RACT on 586 AACC? Y/N	N
Hot Mix Plant AP-42 Section 11.1)	**Input (Bold Color) or Calculated Value (Black)**	**Fuel Type(s)**	**Fuel Type Toggle ("0" or "1")**
Drum Dryer Make/Model	XYZ	Distallate (#2) Fuel Oil	1
Rated heat input capacity, MMBtu/hr	--	Used Oil or RFO4 Oil	1
Drum Dryer Hourly HMA Production, Tons/hour	350	Natural Gas	1
Max Production Per day, Tons per day	2,500	LPG or Propane	1
Max Annual HMA Production, Tons/year	400,000	Default #2 fuel oil and used oil sulfur	0.5%
Min Hours of operation per year (annual/max hourly production)	1,143	Distallate Fuel Oil Max Sulfur Content	0.5000%
		Used Oil/RFO4 Oil Max Sulfur Content	0.5000%

Ambient temperature limits HMA highway construction to 6000 hrs/year max - considered in modeling. EI based on max hourly and annual tons.
Ten years of NOAA data from Boise, Lewiston, and Pocatello: Lewiston most freeze days = 123; no freeze days = 242 (= 5808 hrs)

Asphalt Tank Heater AP-42, Section 11.1 (oil or natural gas fuel), or Section 1.4 (natural gas fuel) - EI based on max operational hrs/hr

Rated heat input capacity, MMBtu/hr	2.820	**Fuel Type(s)**	**Fuel Toggle**
Hours of operation per day	8	#2 Fuel Oil	1
Operation, days per year	250.00	Fuel oil sulfur content	0.0500%
Max Hours of operation per year	2,000	Natural Gas	1

To maintain tank temp, heat is reqd ~33% of 6000 hrs HMA operation/yr = 2000 hr/yr

Tank Heater Fuel Consumption	#2 Fuel Oil	Natural Gas
Heat Input Rating, MMBtu/hr	2.820	2.820
Fuel Heating Value, Btu/gal (oil) or Btu/scf (gas)	137,030	1,020
Heating Value Correction for Natural Gas EFs, see Note	n/a	1.000
Theoretical Max Fuel Use Rate gal/hr [oil] or scf/hr [gas]	20.58	2,765
Max Operational Hours per Year	2,000	2,000

Note: AP-42 EFs for natural gas and diesel combustion are based on heat value of 1,020 Btu/scf and 137,030 Btu/gal

E1 Engine < 175 bhp Tier 2, 89.112 emissions standards apply - EI based on max operational hrs/yr

		Fuel Type(s)	**Engine Toggle**
Engine Make/Model	Small Diesel	#2 Fuel Oil (Diesel)	1
Sum of Engine Maximum Rated Power (bhp)	150	Max Sulfur weight percent (w/o)	0.0500%
EF OPTIONS:		**Use EFs in lb/MMBtu fuel input**	
	0.7457	Max Operational Hours/Day	12
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Max Operational Hours/Year	6,000
Fuel Heating Value, Btu/gal	137,030	Calculated Max Fuel Use Rate, gal/hr	7.66
		Calculated MMBtu/hr	1.05

E2 Engine >175 bhp T2, 89.112 emission standards apply - EI based on max operational hrs/yr

		Fuel Type(s)	**Engine Toggle**
Engine Make/Model	Large Diesel	#2 Fuel Oil (Diesel)	1
Sum of Engine Maximum Rated Power (bhp)	1,100	Max Sulfur weight percent (w/o)	0.0500%
EF OPTIONS:		**Use EFs in lb/MMBtu fuel input**	
	0.7457	Max Operational Hours per Day	12
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Max Operational Hours per Year	6,000
Fuel Heating Value, Btu/gal	137,030	Calculated Max Fuel Use Rate, gal/hr	56.19
		Calculated MMBtu/hr	7.70

Note: AP-42 Tables 3.3-x,3.4-x: avg diesel heating value is based on 19,300 Btu/lb with density equal 7.1 lb/gal=> Btu/gal = 137,030

Aggregate Handling - Fugitive Emissions

U = mean wind speed (miles per hour)	10	
Moisture/Control % Considerations:		
AP-42 Table 11.19.2-2, Note b. Moisture content of uncontrolled sources ranged from 0.21 to 1.3%		
AP-42 Table 11.19.2-2, Note b. Moisture content of controlled (water spray) sources ranged from 0.55 to 2.88% -->		
~91.3% control for screening, ~95% control for conveyor transfer		
M = moisture content (%)	5	Bulk aggregate for HMAs typically stabilizes at 3 to 5% by weight.
If higher moisture is maintained, apply additional % control:	0.00%	For M=3% add 10% control. For M=5% add 15% control.
Number of front-end loader drop points (aggregate and RAP)	2	Drops to storage pile(s) and drop(s) to bins
Aggregate weigh conveyor transfer points	2	Transfer from bins to conveyor & from conveyor to scalping screen
Number of scalping screens, presumed to be	1	Includes all aggregate and RAP tonnage.
Aggregate conveyor transfer to drum	1	Includes all aggregate and RAP tonnage.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33

12/10/2010 10:13 **Permit/Facility ID:** P-2010.Generic 000-00000

EMISSION INVENTORY

POUNDS PER HOUR

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Engine, Silo Fill/Load-out

A. Drum Mix Plant: **350** Tons/hour 1,143 Hours/year **400,000** Tons/year **2,500** Tons/day

Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas

B. Tank Heater: **2.8200** MMBtu/hr **2,000** Hours/year **8** hrs/day

Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = ULSF #2 Fuel Oil Natural Gas

C1. Engine E1: **7.66** gal/hour **6000** Hours/year Engine < 600hp ULSF #2 Fuel Oil **12** hrs/day

C2. Engine E2: **56.19** gal/hour **6000** Hours/year Engine > 600hp ULSF #2 Fuel Oil **12** hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C Engine E1 + E2 Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)	E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
PM (total)	11.55	6.79E-02	5.62E-01	3.88E-01	12.57
PM-10 (total)	8.05	6.79E-02	5.62E-01	3.88E-01	9.07
P.M.-2.5	0.00	0.00E+00	0.00E+00	0.00E+00	0.00
CO	45.50	2.32E-01	8.29E+00	8.85E-01	54.91
NOx	19.25	4.12E-01	1.37E+01		33.40
SO_2	3.85	0.146	0.419		4.42
VOC	11.20	1.52E-02	1.07E+00	1.41E+00	13.70
Lead	5.25E-03	3.11E-05	0.00E+00		0.01
HCl [e]	7.35E-02	0.00E+00	0.00E+00		0.07
Dioxins[e]					
2,3,7,8-TCDD	7.35E-11				**7.35E-11**
Total TCDD	3.26E-10				**3.26E-10**
1,2,3,7,8-PeCDD	1.09E-10				**1.09E-10**
Total PeCDD	7.70E-09				**7.70E-09**
1,2,3,4,7,8-HxCDD	1.47E-10	1.42E-11			**1.61E-10**
1,2,3,6,7,8-HxCDD	4.55E-10				**4.55E-10**
1,2,3,7,8,9-HxCDD	3.43E-10	1.56E-11			**3.59E-10**
Total HxCDD	4.20E-09				**4.20E-09**
1,2,3,4,6,7,8-Hp-CDD	1.68E-09	3.09E-10			**1.99E-09**
Total HpCDD	8.68E-10	4.12E-10			**1.28E-09**
Octa CDD	1.14E-09	7.52E-10			**1.89E-09**
Total PCDD[h]	3.61E-09	9.40E-10			**4.55E-09**
Furans[e]					
2,3,7,8-TCDF	4.43E-11				**4.43E-11**
Total TCDF	1.69E-10	1.55E-11			**1.84E-10**
1,2,3,7,8-PeCDF	1.96E-10				**1.96E-10**
2,3,4,7,8-PeCDF	3.84E-11				**3.84E-11**
Total PeCDF	3.84E-09	2.26E-12			**3.84E-09**
1,2,3,4,7,8-HxCDF	1.83E-10				**1.83E-10**
1,2,3,6,7,8-HxCDF	5.48E-11				**5.48E-11**
2,3,4,6,7,8-HxCDF	8.68E-11				**8.68E-11**
1,2,3,7,8,9-HxCDF	3.84E-10				**3.84E-10**
Total HxCDF	5.94E-10	9.40E-12			**6.03E-10**
1,2,3,4,6,7,8-HpCDF	2.97E-10				**2.97E-10**
1,2,3,4,7,8,9-HpCDF	1.23E-10				**1.23E-10**
Total HpCDF	4.57E-10	4.56E-11			**5.02E-10**
Octa CDF	2.19E-10	5.64E-11			**2.76E-10**
Total PCDF[h]	1.83E-09	1.46E-10			**1.97E-09**
Total PCDD/PCDF[h]	5.48E-09	1.08E-09	0.00E+00		**6.56E-09**
Non-PAH HAPs					
Acetaldehyde[e]	5.94E-02		6.85E-04		**6.00E-02**
Acrolein[e]	2.71E-03		4.86E-05		2.76E-03
Benzene[e]	1.78E-02	1.33E-06	4.76E-03	2.77E-04	**2.28E-02**
1,3-Butadiene[e]			2.81E-05		**2.81E-05**
Ethylbenzene[e]	2.50E-02			1.70E-03	2.67E-02
Formaldehyde[e]	1.42E-01	4.73E-05	1.26E-03	4.01E-03	**1.47E-01**
Hexane[e]	9.58E-02	1.66E-03		1.92E-03	9.94E-02
Isooctane	4.17E-03			1.17E-05	4.18E-03
Methyl Ethyl Ketone[e]	2.08E-03			7.07E-04	2.79E-03
Pentane[e]		2.40E-03			2.40E-03
Propionaldehyde[e]	1.35E-02				1.35E-02
Quinone[e]	1.67E-02				1.67E-02
Methyl chloroform[e]	5.00E-03				5.00E-03
Toluene[e]	3.02E-01	3.13E-06	1.30E-03	1.70E-03	3.05E-01
Xylene[e]	2.08E-02		8.93E-04	8.50E-03	3.02E-02
POM (7-PAH Group)[e]	2.50E-05	4.76E-07	2.62E-05	5.18E-05	**1.04E-04**
TOTAL PAH HAPs	4.04E-02	1.09E-04	1.24E-03	2.25E-03	**4.40E-02**

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C Engine E1 + E2 Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)
PAH HAPs				
2-Methylnaphthalene	7.76E-03	1.51E-08		9.81E-04
3-Methylchloranthrene[e]	0.00E+00	1.14E-09		
Acenaphthene	6.39E-05	2.49E-06	2.57E-05	9.50E-05
Acenaphthylene	1.00E-03	9.40E-07	5.23E-05	5.98E-06
Anthracene	1.42E-04	8.46E-07	7.83E-06	2.60E-05
Benzo(a)anthracene[e]	9.59E-06	1.14E-09	4.49E-06	9.45E-06
Benzo(a)pyrene[e]	4.47E-07	7.57E-10	1.49E-06	3.58E-07
Benzo(b)fluoranthene[e]	4.57E-06	4.70E-07	5.93E-06	1.18E-06
Benzo(e)pyrene	5.02E-06	0.00E+00		2.32E-06
Benzo(g,h,l)perylene	1.83E-06	7.57E-10	3.28E-06	2.96E-07
Benzo(k)fluoranthene[e]	1.87E-06	1.14E-09	1.26E-06	3.42E-07
Chrysene[e]	8.22E-06	1.14E-09	8.32E-06	4.04E-05
Dibenzo(a,h)anthracene[e]	0.00E+00	7.57E-10	2.24E-06	5.76E-08
Dichlorobenzene	0.00E+00	7.57E-07		
Fluoranthene	2.79E-05	2.07E-07	2.67E-05	2.52E-05
Fluorene	5.02E-04	1.50E-07	8.85E-05	2.37E-04
Indeno(1,2,3-cd)pyrene[e]	3.20E-07	1.14E-09	2.45E-06	7.32E-08
Naphthalene[e]	2.97E-02	7.99E-05	7.47E-04	4.06E-04
Perylene	4.02E-07	0.00E+00		6.90E-06
Phenanthrene	1.05E-03	2.30E-05	2.36E-04	3.35E-04
Pyrene	1.37E-04	1.50E-07	2.30E-05	7.44E-05
Non-HAP Organic Compounds				
Acetone[e]	8.65E-02	0.00E+00		9.01E-04
Benzaldehyde	1.15E-02	0.00E+00		
Butane	6.98E-02	1.94E-03		
Butyraldehyde	1.67E-02	0.00E+00		
Crotonaldehyde[e]	8.96E-03	0.00E+00		
Ethylene	7.29E-01	0.00E+00		1.70E-02
Heptane	9.79E-01	0.00E+00		
Hexanal	1.15E-02	0.00E+00		
Isovaleraldehyde	3.33E-03	0.00E+00		
2-Methyl-1-pentene	4.17E-01	0.00E+00		
2-Methyl-2-butene	6.04E-02	0.00E+00		
3-Methylpentane	1.98E-02	0.00E+00		
1-Pentene	2.29E-01	0.00E+00		
n-Pentane	2.19E-02	0.00E+00		
Valeraldehyde[e]	6.98E-03	0.00E+00		
Metals				
Antimony[e]	1.88E-05	3.60E-05		
Arsenic[e]	2.56E-05	6.20E-06		
Barium[e]	6.04E-04	1.76E-05		
Beryllium[e]	0.00E+00	1.31E-07		
Cadmium[e]	1.87E-05	1.87E-06		
Chromium[e]	5.73E-04	5.80E-06		
Cobalt[e]	2.71E-06	4.13E-05		
Copper[e]	3.23E-04	1.21E-05		
Hexavalent Chromium[e]	2.05E-05	1.17E-06		
Manganese[e]	8.02E-04	2.06E-05		
Mercury[e]	2.71E-04	7.75E-07		
Molybdenum[e]	0.00E+00	5.40E-06		
Nickel[e]	2.88E-03	3.97E-04		
Phosphorus[e]	2.92E-03	6.49E-05		
Silver[e]	5.00E-05	0.00E+00		
Selenium[e]	3.65E-05	4.69E-06		
Thallium[e]	4.27E-07	0.00E+00		
Vanadium[e]	0.00E+00	2.18E-04		
Zinc[e]	6.35E-03	2.00E-04		

e) IDAPA Toxic Air Pollutant

Criteria Pollutant lb/hr emissions are maximum 1-hr averages

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

LPG/Propane

E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
8.74E-03
1.14E-09
1.87E-04
1.06E-03
1.76E-04
2.35E-05
2.30E-06
1.21E-05
7.34E-06
5.41E-06
3.48E-06
5.69E-05
2.30E-06
7.57E-07
8.00E-05
8.28E-04
2.85E-06
3.09E-02
7.30E-06
1.64E-03
2.35E-04
8.74E-02
1.15E-02
7.17E-02
1.67E-02
8.96E-03
7.46E-01
9.79E-01
1.15E-02
3.33E-03
4.17E-01
6.04E-02
1.98E-02
2.29E-01
2.19E-02
6.98E-03
5.48E-05
3.18E-05
6.22E-04
1.31E-07
2.06E-05
5.79E-04
4.40E-05
3.35E-04
2.17E-05
8.23E-04
2.72E-04
5.40E-06
3.27E-03
2.98E-03
5.00E-05
4.11E-05
4.27E-07
2.18E-04
6.55E-03

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engi

12/10/2010 10:13 **Permit/Facility ID:** P-2010.Gen 000-00000

EMISSION INVENTORY

POUNDS PER HOUR

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Engine, Silo Fill/Load-out

A. Drum Mix Plant: 350 Tons/hour 1,143 Hours/year 400,000 Tons/year HMA throughput 2,500

Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas LPG/Propa

B. Tank Heater: 2.8200 MMBtu/hr 2,000 Hours/year 8

Maximum emission for each pollutant from any fual-burning option selected. Fuels Selected = #2 Fuel Oil Natural Gas

C1. Engine E1: 7.66 gal/hour 6000 Hours/year #2 Fuel Oil Engine < 600hp 12

C2. Engine E2: 56.19 gal/hour 6000 Hours/year #2 Fuel Oil Engine > 600hp 12

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C Engine Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)	E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
non-PAH HAPs[e]					
Bromomethane[e]				1.04E-04	1.04E-04
2-Butanone (see Methyl Ethyl Ketone)					
Carbon disulfide[e]				2.59E-04	2.59E-04
Chloroethane (Ethyl chloride[e])				5.17E-05	5.17E-05
Chloromethane (Methyl chloride[e])				3.57E-04	3.57E-04
Cumene				4.77E-04	4.77E-04
n-Hexane					
Methylene chloride (Dichloromethane[e])				3.43E-06	3.43E-06
MTBE					
Styrene[e]				1.00E-04	1.00E-04
Tetrachloroethene (Tetrachloroethylene[e])				3.34E-05	3.34E-05
1,1,1-Trichloroethane (Methyl chloroform[e])					
Trichloroethene (Trichloroethylene[e])					
Trichlorofluoromethane				5.63E-06	5.63E-06
m-/p-Xylene[e]				4.32E-03	4.32E-03
o-Xylene[e]				4.19E-03	4.19E-03
Phenol[e,f]				4.19E-04	4.19E-04
Non-HAP Organic Compounds					
Methane				3.58E-01	3.58E-01

e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

hrs/day
ne
hrs/day

hrs/day
hrs/day

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs

12/10/2010 10:13 Permit/Facility ID: P-2010.Generic 000-00000

EMISSION INVENTORY
TONS PER YEAR

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Engine, Silo Fill/Load-out

A. Drum Mix Plant: 350 Tons/hour 1,143 Hours/year 400,000 Tons/year HMA throughput 2,500 hrs/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas
B. Tank Heater: 2.8200 MMBtu/hr 2,000 Hours/year 8 hrs/day
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Select ULSF #2 Fuel Oil Natural Gas
C1. Engine E1: 7.66 gal/hour 6000 Hours/year Engine <600hp ULSF #2 Fuel Oil 12 hrs/day
C2. Engine E2: 56.19 gal/hour 6000 Hours/year Engine > 600hp ULSF #2 Fuel Oil 12 hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (T/yr)	C Engine E1 + E2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling, Emission Rate for Pollutant (T/yr)	E TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives from D
PM (total)	6.60	6.79E-02	1.687	2.22E-01	8.35
PM-10 (total)	4.60	6.79E-02	1.687	2.22E-01	6.35
P.M.-2.5					
CO	26.00	2.32E-01	24.868	5.06E-01	51.10
NOx	11.00	4.12E-01	41.204		52.62
SO_2	2.20	0.146	1.258		3.60
VOC	6.40	1.52E-02	3.21E+00	8.06E-01	9.63
Lead	3.00E-03	3.11E-05	0.00E+00		3.03E-03
HCl [e]	4.20E-02	0.00E+00	0.00E+00		4.20E-02
Dioxins[e]					
2,3,7,8-TCDD	4.20E-11				4.20E-11
Total TCDD	1.86E-10				1.86E-10
1,2,3,7,8-PeCDD	6.20E-11				6.20E-11
Total PeCDD	4.40E-09				4.40E-09
1,2,3,4,7,8-HxCDD	8.40E-11	1.42E-11			9.82E-11
1,2,3,6,7,8-HxCDD	2.60E-10				2.60E-10
1,2,3,7,8,9-HxCDD	1.96E-10	1.56E-11			2.12E-10
Total HxCDD	2.40E-09				2.40E-09
1,2,3,4,6,7,8-Hp-CDD	9.60E-10	3.09E-10			1.27E-09
Total HpCDD	3.80E-09	4.12E-10			4.21E-09
Octa CDD	5.00E-09	3.29E-09			8.29E-09
Total PCDD[h]	1.58E-08	4.12E-09			1.99E-08
Furans[e]					
2,3,7,8-TCDF	1.94E-10				1.94E-10
Total TCDF	7.40E-10	6.79E-11			8.08E-10
1,2,3,7,8-PeCDF	8.60E-10				8.60E-10
2,3,4,7,8-PeCDF	1.68E-10				1.68E-10
Total PeCDF	1.68E-08	9.88E-12			1.68E-08
1,2,3,4,7,8-HxCDF	8.00E-10				8.00E-10
1,2,3,6,7,8-HxCDF	2.40E-10				2.40E-10
2,3,4,6,7,8-HxCDF	3.80E-10				3.80E-10
1,2,3,7,8,9-HxCDF	1.68E-09				1.68E-09
Total HxCDF	2.60E-09	4.12E-11			2.64E-09
1,2,3,4,6,7,8-HpCDF	1.30E-09				1.30E-09
1,2,3,4,7,8,9-HpCDF	5.40E-10				5.40E-10
Total HpCDF	2.00E-09	2.00E-10			2.20E-09
Octa CDF	9.60E-10	2.47E-10			1.21E-09
Total PCDF[h]	8.00E-09	6.38E-10			8.64E-09
Total PCDD/PCDF[h]	2.40E-08	4.73E-09			2.87E-08
Non-PAH HAPs					
Acetaldehyde[e]	2.60E-01		3.00E-03		2.63E-01
Acrolein[e]	5.20E-03		4.73E-04		5.67E-03
Benzene[e]	7.80E-02	5.81E-06	2.09E-02	1.21E-03	9.89E-02
1,3-Butadiene[e]	0.00E+00		1.23E-04		1.23E-04
Ethylbenzene[e]	4.80E-02			3.26E-03	4.80E-02
Formaldehyde[e]	6.20E-01	2.07E-04	5.54E-03	1.75E-02	6.26E-01
Hexane[e]	1.84E-01	4.98E-03		3.69E-03	1.89E-01
Isooctane	8.00E-03			2.25E-05	8.00E-03
Methyl Ethyl Ketone[e]	4.00E-03			1.36E-03	4.00E-03
Pentane[e]	0.00E+00	7.19E-03			7.19E-03
Propionaldehyde[e]	2.60E-02				2.60E-02
Quinone[e]	3.20E-02				3.20E-02
Methyl chloroform[e]	9.60E-03				9.60E-03
Toluene[e]	5.80E-01	9.40E-06	7.78E-03	3.26E-03	5.88E-01
Xylene[e]	4.00E-02	0.00E+00	5.36E-03	1.63E-02	4.54E-02
TOTAL Federal HAPs (T/yr)=					2.21E+00

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (T/yr)	C Engine E1 + E2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling Emission Rate for Pollutant (T/yr)
PAH HAPs				
2-Methylnaphthalene	3.40E-02	6.64E-08		4.30E-03
3-Methylchloranthrene[e]	0.00E+00	4.98E-09		
Acenaphthene	2.80E-04	1.09E-05	1.13E-04	4.16E-04
Acenaphthylene	4.40E-03	4.12E-06	2.29E-04	2.62E-05
Anthracene	6.20E-04	3.70E-06	3.43E-05	1.14E-04
Benzo(a)anthracene[e]	4.20E-05	4.98E-09	1.97E-05	4.14E-05
Benzo(a)pyrene[e]	1.96E-06	3.32E-09	6.53E-06	1.57E-06
Benzo(b)fluoranthene[e]	2.00E-05	2.06E-06	2.60E-05	5.18E-06
Benzo(e)pyrene	2.20E-05	0.00E+00		1.01E-05
Benzo(g,h,i)perylene	8.00E-06	3.32E-09	1.44E-05	1.30E-06
Benzo(k)fluoranthene[e]	8.20E-06	4.98E-09	5.52E-06	1.50E-06
Chrysene[e]	3.60E-05	4.98E-09	3.65E-05	1.77E-04
Dibenzo(a,h)anthracene[e]	0.00E+00	3.32E-09	9.83E-06	2.52E-07
Dichlorobenzene	0.00E+00	3.32E-06		
Fluoranthene	1.22E-04	9.05E-07	1.17E-04	1.10E-04
Fluorene	2.20E-03	6.59E-07	3.88E-04	1.04E-03
Indeno(1,2,3-cd)pyrene[e]	1.40E-06	4.98E-09	1.07E-05	3.20E-07
Naphthalene[e]	1.30E-01	3.50E-04	3.27E-03	1.78E-03
Perylene	1.76E-06	0.00E+00		3.02E-05
Phenanthrene	4.60E-03	1.01E-04	1.04E-03	1.47E-03
Pyrene	6.00E-04	6.59E-07	1.01E-04	3.26E-04
Non-HAP Organic Compounds				
Acetone[e]	1.66E-01	0.00E+00		1.73E-03
Benzaldehyde	2.20E-02	0.00E+00		
Butane	1.34E-01	5.81E-03		
Butyraldehyde	3.20E-02	0.00E+00		
Crotonaldehyde[e]	1.72E-02	0.00E+00		
Ethylene	1.40E+00	0.00E+00		3.27E-02
Heptane	1.88E+00	0.00E+00		
Hexanal	2.20E-02	0.00E+00		
Isovaleraldehyde	6.40E-03	0.00E+00		
2-Methyl-1-pentene	8.00E-01	0.00E+00		
2-Methyl-2-butene	1.16E-01	0.00E+00		
3-Methylpentane	3.80E-02	0.00E+00		
1-Pentene	4.40E-01	0.00E+00		
n-Pentane[e]	4.20E-02	0.00E+00		
Valeraldehyde[e]	1.34E-02	0.00E+00		
Metals				
Antimony[e]	3.60E-05	1.08E-04		
Arsenic[e]	1.12E-04	2.72E-05		
Barium[e]	1.16E-03	5.29E-05		
Beryllium[e]	0.00E+00	5.72E-07		
Cadmium[e]	8.20E-05	8.19E-06		
Chromium[e]	1.10E-03	1.74E-05		
Cobalt[e]	5.20E-06	1.24E-04		
Copper[e]	6.20E-04	3.62E-05		
Hexavalent Chromium[e]	9.00E-05	5.10E-06		
Manganese[e]	1.54E-03	6.17E-05		
Mercury[e]	5.20E-04	2.33E-06		
Molybdenum[e]	0.00E+00	1.62E-05		
Nickel[e]	1.26E-02	1.74E-03		
Phosphorus[e]	5.60E-03	1.95E-04		
Silver[e]	9.60E-05	0.00E+00		
Selenium[e]	7.00E-05	1.41E-05		
Thallium[e]	8.20E-07			
Vanadium[e]	0.00E+00	6.54E-04		
Zinc[e]	1.22E-02	5.99E-04		

e) IDAPA Toxic Air Pollutant

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs

12/10/2010 10:13 Permit/Facility ID: P-2010.Gen 000-00000

EMISSION INVENTORY

TONS PER YEAR

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Engine, Silo Fill/Load-out

A. Drum Mix Plant: 350 Tons/hour 1,143 Hours/year 400,000 Tons/year

Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas LPG/Propane

B. Tank Heater: 2.8200 MMBtu/hr 2,000 Hours/year

Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Natural Gas

C1. Engine E1: 7.66 gal/hour 6000 Hours/year #2 Fuel Oil Engine <600hp

C2. Engine E2: 56.19 gal/hour 6000 Hours/year #2 Fuel Oil Engine > 600hp

E TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives from D
3.40E-02
4.98E-09
4.03E-04
4.63E-03
6.58E-04
6.17E-05
8.49E-06
4.80E-05
2.20E-05
2.24E-05
1.37E-05
7.25E-05
9.83E-06
3.32E-06
2.40E-04
2.59E-03
1.21E-05
1.34E-01
1.76E-06
5.74E-03
7.01E-04
1.66E-01
2.20E-02
1.40E-01
3.20E-02
1.72E-02
1.40E+00
1.88E+00
2.20E-02
6.40E-03
8.00E-01
1.16E-01
3.80E-02
4.40E-01
4.20E-02
1.34E-02
1.44E-04
1.39E-04
1.21E-03
5.72E-07
9.02E-05
1.12E-03
1.29E-04
6.56E-04
9.51E-05
1.60E-03
5.22E-04
1.62E-05
1.43E-02
5.79E-03
9.60E-05
8.41E-05
8.20E-07
6.54E-04
1.28E-02

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (T/yr)	C Engine Max Emission Rate for Pollutant (T/yr)	D Load-out, Silo Filling, & Tank Storage Emission Rate for Pollutant (T/yr)	E TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives from D
non-PAH HAPs[e]					
Bromomethane[e]				1.99E-04	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)					0.00E+00
Carbon disulfide[e]				4.98E-04	0.00E+00
Chloroethane (Ethyl chloride[e])				9.92E-05	0.00E+00
Chloromethane (Methyl chloride[e])				6.85E-04	0.00E+00
Cumene				9.15E-04	0.00E+00
n-Hexane				0.00E+00	0.00E+00
Methylene chloride (Dichloromethane[e])				6.58E-06	0.00E+00
MTBE					0.00E+00
Styrene[e]				1.92E-04	0.00E+00
Tetrachloroethene (Tetrachloroethylene[e])				6.40E-05	0.00E+00
1,1,1-Trichloroethane (Methyl chloroform[e])				0.00E+00	0.00E+00
Trichloroethene (Trichloroethylene[e])				0.00E+00	0.00E+00
Trichlorofluoromethane				1.08E-05	0.00E+00
m-/p-Xylene[e]				8.29E-03	0.00E+00
o-Xylene[e]				8.04E-03	0.00E+00
Phenol[e,f]				8.05E-04	0.00E+00
Non-HAP Organic Compounds					
Methane				6.88E-01	0.00E+00

e) IDAPA Toxic Air Pollutant

2,500 Tons/day
LPG/Propane
8 hrs/day

12 hrs/day
12 hrs/day

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs

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AP-42 3.3-1 SO2 EF = 0.29 for #2 fuel oil, presumed max 0.5%

SO2 emissions are multiplied by a factor: User Input Value/0.5% = 0.1000

User Input Weight % Sulfur = 0.0500%

E1 Engine <175 bhp

Fuel Type Toggle =	1	150 bhp
Fuel Consumption Rate	7.66 gal/hr	
Calculated MMBtu/hr	1.0500 MMBtu/hr	
Max Daily Operation	12 hr/day	
Max Annual Operation	6,000 hrs/yr	

40 CFR 89.112 TIER 2 EMISSION STANDARDS:		<175 bhp conversion from kW to b
PM (presume PM = PM10)	0.60 g/bhp-hr	0.8 g/kW-
CO	6.00 g/bhp-hr	8 g/kW-
NMHC + NOx	5.60 g/bhp-hr	7.5 g/kW-

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total)[b]	0.31	0.326	9.77E-01	
PM-10 (total)[b]	0.31	0.326	9.77E-01	
P.M.-2.5				
CO[b]	0.95	0.998	2.99E+00	
NOx[b]	4.41	4.631	1.39E+01	
SO_2[b] (total SOx presumed SO2)	2.900E-02	3.05E-02	0.091	
VOC[b] (total TOC--> VOCs)	0.36	0.378	1.13E+00	
Lead				
HCl[e]				
Dioxins[e]				
2,3,7,8-TCDD	**TIER 2 EMISSIONS <175hp**			
Total TCDD	**PM/PM10**	**0.198**	**0.595**	
1,2,3,7,8-PeCDD	**CO**	**1.984**	**5.95**	
Total PeCDD	**NMHC + NO**	**1.852**	**5.56**	
1,2,3,4,7,8-HxCDD[c]				
1,2,3,6,7,8-HxCDD	**1 lb =**	**453.5924**	**g**	
1,2,3,7,8,9-HxCDD[c]				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]				
Total HpCDD$_c$				
Octa CDD[c]				
Total PCDD[c]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]				
Octa CDF[c]				
Total PCDF[c]				
Total PCDD/PCDF[c]				
Non-PAH HAPs				
Acetaldehyde[c]	7.67E-04	8.05E-04	2.42E-03	**5.52E-04**
Acrolein[c]	9.25E-05	9.71E-05	2.91E-04	4.86E-05
Benzene[c,e]	9.33E-04	9.80E-04	2.94E-03	**6.71E-04**
1,3-Butadiene[c,e]	3.91E-05	4.11E-05	1.23E-04	**2.81E-05**
Ethylbenzene[e]				
Formaldehyde[c,e]	1.18E-03	1.24E-03	3.72E-03	**8.49E-04**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	4.09E-04	4.29E-04	1.29E-03	2.15E-04
Xylene[c,e]	2.85E-04	2.99E-04	8.98E-04	1.50E-04
PAH, Total		1.76E-04		**1.21E-04**
POM (7-PAH Group)		3.60E-06		**2.47E-06**

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c]	1.42E-06	1.49E-06	4.47E-06	**1.02E-06**
Acenaphthylene[c]	5.06E-06	5.31E-06	1.59E-05	**3.64E-06**
Anthracene[c]	1.87E-06	1.96E-06	5.89E-06	**1.34E-06**
Benzo(a)anthracene[c]	1.68E-06	1.76E-06	5.29E-06	**1.21E-06**
Benzo(a)pyrene[c,e]	1.88E-07	1.97E-07	5.92E-07	**1.35E-07**
Benzo(b)fluoranthene[c]	9.91E-08	1.04E-07	3.12E-07	**7.13E-08**
Benzo(e)pyrene				
Benzo(g,h,l)perylene[c]	4.89E-07	5.13E-07	1.54E-06	**3.52E-07**
Benzo(k)fluoranthene[c]	1.55E-07	1.63E-07	4.88E-07	**1.11E-07**
Chrysene[c]	3.53E-07	3.71E-07	1.11E-06	**2.54E-07**
Dibenzo(a,h)anthracene[c]	5.83E-07	6.12E-07	1.84E-06	**4.19E-07**
Dichlorobenzene				
Fluoranthene[c]	7.61E-06	7.99E-06	2.40E-05	**5.47E-06**
Fluorene[c]	2.92E-05	3.07E-05	9.20E-05	**2.10E-05**
Indeno(1,2,3-cd)pyrene[c]	3.75E-07	3.94E-07	1.18E-06	**2.70E-07**
Naphthalene[c,e]	8.48E-05	8.90E-05	2.67E-04	**6.10E-05**
Perylene				
Phenanthrene[c]	2.94E-05	3.09E-05	9.26E-05	**2.11E-05**
Pyrene[c]	4.78E-06	5.02E-06	1.51E-05	**3.44E-06**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42

b) AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96

c) AP-42, Table 3.3-2, Speciated Organic Compoun Emission Factors for Uncontrolled Diesel Engine, Emission Factor Rating E, 10/96

d) (reserved)

e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
12/10/2010 10:13 Permit/Facility ID: P-2010.Gen(000-00000

E2 Engine > 175 bhp

Fuel Type Toggle =	1	1,100 bhp Engine
Fuel Consumption Rate	56.19 gal/hr	
Calculated MMBtu/hr	7.7000 MMBtu/hr	
Max Daily Operation	12 hr/day	
Max Annual Operation	6,000 hrs/yr	

User Input Weight % Sulfur = 0.0500% AP-42 3.4-1 SO2 EF = 1.01 x S

40 CFR 89.112 TIER 2 EMISSION STANDARDS:		>175 bhp conversion from kW to bhp
PM (presume PM = PM10)	0.15 g/bhp-hr	0.2 g/kW-hr
CO	2.60 g/bhp-hr	3.5 g/kW-hr
NMHC + NOx	4.90 g/bhp-hr	6.6 g/kW-hr

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM [b]	0.1	0.770	2.31E+00	
PM-10 (total) [d]	0.0573	0.441	1.324	
P.M.-2.5		0.000		
CO [b]	0.85	6.545	19.64	
NOx[b]	3.2	24.640	73.92	
SO_2 [b] (total SOx presumed SO2)	5.050E-02	3.89E-01	1.167	
VOC [b] (total TOC--> VOCs)	0.09	0.693	2.079	
Lead				
HCl [e]				
Dioxins[e]				
2,3,7,8-TCDD	TIER 2 EMISSIONS >175hp			
Total TCDD	PM/PM10	0.364	1.091	
1,2,3,7,8-PeCDD	CO	6.305	18.92	
Total PeCDD	NMHC + NOx	11.883	35.65	
1,2,3,4,7,8-HxCDD[c]				
1,2,3,6,7,8-HxCDD	1 lb =	453.5924	g	
1,2,3,7,8,9-HxCDD[c]				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]				
Total HpCDD[c]				
Octa CDD[c]				
Total PCDD[c]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]				
Octa CDF[c]				
Total PCDF[c]				
Total PCDD/PCDF[c]				
Non-PAH HAPs				
Acetaldehyde[c]	2.52E-05	1.94E-04	5.82E-04	**1.33E-04**
Acrolein[c]	7.88E-06	6.07E-05	1.82E-04	
Benzene[c,e]	7.76E-04	5.98E-03	1.79E-02	**4.09E-03**
1,3-Butadiene[c,e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	7.89E-05	6.08E-04	1.82E-03	**4.16E-04**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	2.81E-04	0.002	6.49E-03	1.08E-03
Xylene[c,e]	1.93E-04	0.001	4.46E-03	7.43E-04
PAH, Total		1.63E-03		**1.12E-03**
POM (7-PAH Group)		3.46E-05		**2.37E-05**

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c1]	4.68E-06	3.60E-05	1.08E-04	**2.47E-05**
Acenaphthylene[c1]	9.23E-06	7.11E-05	2.13E-04	**4.87E-05**
Anthracene[c1]	1.23E-06	9.47E-06	2.84E-05	**6.49E-06**
Benzo(a)anthracene[c1]	6.22E-07	4.79E-06	1.44E-05	**3.28E-06**
Benzo(a)pyrene[c1,e]	2.57E-07	1.98E-06	5.94E-06	**1.36E-06**
Benzo(b)fluoranthene[c1]	1.11E-06	8.55E-06	2.56E-05	**5.85E-06**
Benzo(e)pyrene				
Benzo(g,h,l)perylene[c1]	5.56E-07	4.28E-06	1.28E-05	**2.93E-06**
Benzo(k)fluoranthene[c1]	2.18E-07	1.68E-06	5.04E-06	**1.15E-06**
Chrysene[c1]	1.53E-06	1.18E-05	3.53E-05	**8.07E-06**
Dibenzo(a,h)anthracene[c1]	3.46E-07	2.66E-06	7.99E-06	**1.82E-06**
Dichlorobenzene				
Fluoranthene[c1]	4.03E-06	3.10E-05	9.31E-05	**2.13E-05**
Fluorene[c1]	1.28E-05	9.86E-05	2.96E-04	**6.75E-05**
Indeno(1,2,3-cd)pyrene[c1]	4.14E-07	3.19E-06	9.56E-06	**2.18E-06**
Naphthalene[c1,e]	1.30E-04	1.00E-03	3.00E-03	**6.86E-04**
Perylene				
Phenanthrene[c1]	4.08E-05	3.14E-04	9.42E-04	**2.15E-04**
Pyrene[c1]	3.71E-06	2.86E-05	8.57E-05	**1.96E-05**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42
b) AP-42, Table 3.4-1, Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual Fuel Engines, 10/96
c) AP-42, Table 3.4-3, Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, **Emission Factor Rating E**, 10/96
c1) AP-42, Table 3.4-4, PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines, **Emission Factor Rating E**, 10/96
d) AP-42, Table 3.4-2, Particulate and Particle-Sizing Emission Factors for Large Uncontrolled Stationary Diesel Engines, **Emission Factor Rating E**, 10/96
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs

12/10/2010 10:13 **Permit/Facility ID:** P-2010.Gen 000-00000

TAPs EL Screen - ALL SOURCES

586 pollutants are shown in bold

Max Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Engine, Silo Fill/Load-out

A. Drum Mix Plant: **350** Tons/hour 1,143 Hours/year **400,000** Tons/year **2,500** Tons/day

Maximum emission for each pollutant from any fuel-burning option selected on "Facility Data" worksheet

B. Tank Heater: **2.8200** MMBtu Rated **2,000** Hours/year

Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet

D. Include all emissions from Load-out/Silo Filling? **Yes**

Short Term Source Factor 586 ELs? 1

Pollutant	TOTAL of Max Emission Rates from A, B, C & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled? Meets AAC or AACC?
HCl[e]	0.074	0.05	Exceeds	
Dioxins[e]		**Toxic Equivalency Factor[c]**	**Adjusted Emission Rate (lb/hr)**	
2,3,7,8-TCDD	7.35E-11	1.0	7.35E-11	
Total TCDD	3.26E-10	n/a		
1,2,3,7,8-PeCDD	1.09E-10	0.5	5.43E-11	
Total PeCDD	7.70E-09	n/a		
1,2,3,4,7,8-HxCDD	1.61E-10	0.1	1.61E-11	
1,2,3,6,7,8-HxCDD	4.55E-10	0.1	4.55E-11	
1,2,3,7,8,9-HxCDD	3.59E-10	0.1	3.59E-11	
Total HxCDD	4.20E-09	n/a		
1,2,3,4,6,7,8-Hp-CDD	1.99E-09	0.01	1.99E-11	
Total HpCDD	1.28E-09	n/a		
Octa CDD	1.89E-09	0.0001	1.89E-13	
Total PCDD[h]	4.55E-09	n/a		
Furans[e]				
2,3,7,8-TCDF	4.43E-11	0.1	4.43E-12	
Total TCDF	1.84E-10	n/a		
1,2,3,7,8-PeCDF	1.96E-10	0.05	9.82E-12	
2,3,4,7,8-PeCDF	3.84E-11	0.5	1.92E-11	
Total PeCDF	3.84E-09	n/a		
1,2,3,4,7,8-HxCDF	1.83E-10	0.1	1.83E-11	
1,2,3,6,7,8-HxCDF	5.48E-11	0.1	5.48E-12	
2,3,4,6,7,8-HxCDF	8.68E-11	0.1	8.68E-12	
1,2,3,7,8,9-HxCDF	3.84E-10	0.1	3.84E-11	
Total HxCDF	6.03E-10	n/a		
1,2,3,4,6,7,8-HpCDF	2.97E-10	0.01	2.97E-12	
1,2,3,4,7,8,9-HpCDF	1.23E-10	0.01	1.23E-12	
Total HpCDF	5.02E-10	n/a		
Octa CDF	2.76E-10	0.0001	2.76E-14	
Total PCDF[h]	1.97E-09	n/a		
Total PCDD/PCDF[h]	6.56E-09	n/a		
TOTAL	Adjusted lb/hr	TAPs EL for 2,3,7,8 TCDD	**Exceeds TAPs EL?**	Modeled?
Dioxin/Furans[c]	3.54E-10	1.50E-10	Exceeds	
Non-PAH HAPs				
Acetaldehyde[e]	6.00E-02	3.00E-03	Exceeds	
Acrolein[e]	2.76E-03	0.017	No	
Benzene[e]	2.28E-02	8.00E-04	Exceeds	
1,3-Butadiene[e]				
Ethylbenzene[e]	2.67E-02	29	No	
Formaldehyde[e]	1.47E-01	5.10E-04	Exceeds	
Hexane[e]	9.94E-02	12	No	
Isooctane	4.18E-03			
Methyl Ethyl Ketone[e]	2.79E-03	39.3	No	
Pentane[e]	2.40E-03	118	No	
Propionaldehyde[e]	1.35E-02	0.0287	No	
Quinone[e]	1.67E-02	0.027	No	
Methyl chloroform[e]	5.00E-03	127	No	
Toluene[e]	3.05E-01	25	No	
Xylene[e]	3.02E-02	29	No	
TOTAL PAH HAPs (lb/hr) =	4.40E-02	9.10E-05	Exceeds	

Pollutant	TOTAL of Max Emission Rates from A, B, C & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled? Meets AAC or AACC?
PAH HAPs				
2-Methylnaphthalene	8.74E-03	9.10E-05	Exceeds	
3-Methylchloranthrene[e]	1.14E-09	2.50E-06	No	
Acenaphthene	1.87E-04	9.10E-05	Exceeds	
Acenaphthylene	1.06E-03	9.10E-05	Exceeds	
Anthracene	1.76E-04	9.10E-05	Exceeds	
Benzo(a)anthracene	2.35E-05			see POM
Benzo(a)pyrene[e]	2.30E-06	2.00E-06	Exceeds	see POM
Benzo(b)fluoranthene	1.21E-05			see POM
Benzo(e)pyrene	7.34E-06	9.10E-05	No	
Benzo(g,h,l)perylene	5.41E-06	9.10E-05	No	
Benzo(k)fluoranthene	3.48E-06			see POM
Chrysene	5.69E-05			see POM
Dibenzo(a,h)anthracene	2.30E-06			see POM
Dichlorobenzene	7.57E-07	9.10E-05	No	
Fluoranthene	8.00E-05	9.10E-05	No	
Fluorene	8.28E-04	9.10E-05	Exceeds	
Indeno(1,2,3-cd)pyrene	2.85E-06			see POM
Naphthalene[e]	3.09E-02	9.10E-05	Exceeds	
Perylene	7.30E-06	9.10E-05	No	
Phenanthrene	1.64E-03	9.10E-05	Exceeds	
Pyrene	2.35E-04	9.10E-05	Exceeds	
PolycyclicOrganicMatter[d,e]	1.04E-04	2.00E-06	Exceeds	
Non-HAP Organic Compounds				
Acetone[e]	8.74E-02	119	No	
Benzaldehyde	1.15E-02			
Butane	7.17E-02			
Butyraldehyde	1.67E-02			
Crotonaldehyde[e]	8.96E-03	0.38	No	
Ethylene	7.46E-01			
Heptane	9.79E-01	109	No	
Hexanal	1.15E-02			
Isovaleraldehyde	3.33E-03			
2-Methyl-1-pentene	4.17E-01			
2-Methyl-2-butene	6.04E-02			
3-Methylpentane	1.98E-02			
1-Pentene	2.29E-01			
n-Pentane[e]	2.19E-02	118	No	
Valeraldehyde (n-Valeraldehyde[e])	6.98E-03	11.7	No	
Metals				
Antimony[e]	5.48E-05	0.033	No	
Arsenic[e]	3.18E-05	1.50E-06	Exceeds	
Barium[e]	6.22E-04	0.033	No	
Beryllium[e]	1.31E-07	2.80E-05	No	
Cadmium[e]	2.06E-05	3.70E-06	Exceeds	
Chromium[e]	5.79E-04	0.033	No	
Cobalt[e]	4.40E-05	0.0033	No	
Copper[e]	3.35E-04	0.013	No	
Hexavalent Chromium[e]	2.17E-05	5.60E-07	Exceeds	
Manganese[e]	8.23E-04	0.067	No	
Mercury[e]	2.72E-04	0.003	No	
Molybdenum[e]	5.40E-06	0.333	No	
Nickel[e]	3.27E-03	2.70E-05	Exceeds	
Phosphorus[e]	2.98E-03	0.007	No	
Silver[e]	5.00E-05	0.007	No	
Selenium[e]	4.11E-05	0.013	No	
Thallium[e]	4.27E-07	0.007	No	
Vanadium[e]	2.18E-04	0.003	No	
Zinc[e]	6.55E-03	0.667	No	

a) Reserved.

b) Toxic Air Pollutants, IDAPA 58.01.01.585 and .586, levels in effect as of January 27, 2006

c) Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-dioxins and Dibenzofurans (CDDs and CDFs, 1989 update, EPA/625/3-89/016, March 1989 (Source: Mike Dubois, IDEQ State Office, April 2005)

Plus 1,2,3,7,8 PeCDD,OCDD & OCDF TEFs, Van den Berg, et al, 1998, Environmental Health Perspectives 106, 775. accessed at www.dioxinfacts.org/dioxin_health/dioxin_tissues/dioxin_toxicity.html

n/a = not available. IDAPA 58.01.01.586, TAPs Carcinogenic Increments: Total of adjusted emission rates are treated as a single TAP (2,3,7,8 TCDD)

d) IDAPA 58.01.01.586, Polycyclic Organic Matter: Emissions of PAHs shown in bold shall be considered together as one TAP equivalent in potency to benzo(a)pyrene.

e) IDAPA Toxic Air Pollutant, 58.01.01.585 or .586

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs

12/10/2010 10:13 Permit/Facility ID: P-2010.Gei 000-00000

Max Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Engine, Silo Fill/Load-out

A. Drum Mix Plant: 350 Tons/hour 1,143 Hours/year 400,000 Tons/year 2,500 Tons/day
Maximum emission for each pollutant from any fuel-burning option selected in "Facility Data" worksheet.

B. Tank Heater: 2.8200 MMBtu Rated 2,000 Hours/year D. Include all emissions from Load-out/Silo/Storage? Yes
Maximum emission for each pollutant for heater burning any fuel selected in "Facility Data" worksheet.

C. Engine: 56.19207473 gal/hour #REF! Hours/year Small or Large Engine using Diesel Fuel

Pollutant	TOTAL of Max Emission Rates from A, B, C & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled?
non-PAH HAPs[a]				
Bromomethane (Methyl bromide[e])	1.04E-04	1.27	No	
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	2.59E-04	2	No	
Chloroethane (Ethyl chloride[e])	5.17E-05	176	No	
Chloromethane (Methyl chloride[e])	3.57E-04	6.867	No	
Cumene[e]	4.77E-04	16.3	No	
n-Hexane[e] (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	3.43E-06	1.60E-03	No	
MTBE	0.00E+00			
Styrene[e]	1.00E-04	6.67	No	
Tetrachloroethene (Tetrachloroethylene[e])	3.34E-05	1.30E-02	No	
1,1,1-Trichloroethane (see Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])	0.00E+00	17.93	No	
Trichlorofluoromethane	5.63E-06			
m-/p-Xylene[e] (added into Xylene[e])				
o-Xylene[e] (added into Xylene[e])				
Phenol[e,f]	4.19E-04	1.27	No	
Non-HAP Organic Compounds				
Methane	3.58E-01			

a) For HMA facilities subject to NSPS (40 CFR 60, Subpart I), PTE includes fugitive emissions of PM from load-out, silo filling & storage tank operations.
e) IDAPA Toxic Air Pollutant, 58.01.01.585 or .586

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
12/10/2010 10:28 **Permit/Facility ID:** P-2010.Generi 000-00000

Used Oil Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle =	1	
Max Hourly Production	350	T/hr
Max Daily Production	2,500	Tons/day
Max Annual Production	400,000	Tons/yr

User Input Weight % Sulfur = 0.5000%

[illegible]

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total) [b]	0.033	11.55	6.6	
PM-10 (total) [b]	0.023	8.05	4.6	
P.M.-2.5 [b1]	*0.0029*			
CO [c]	0.13	45.5	26	
NOx [c]	0.055	19.25	11	
[illegible]	[illegible]	[illegible]	[illegible]	
VOC [d]	0.032	11.2	6.4	
Lead	1.50E-05	5.25E-03	3.00E-03	
HCl [d,e]	0.00021	0.0735	4.20E-02	
Dioxins[e,f]				
2,3,7,8-TCDD	2.10E-13	7.35E-11	4.20E-11	**9.59E-12**
Total TCDD	9.30E-13	3.26E-10	1.86E-10	**4.25E-11**
1,2,3,7,8-PeCDD	3.10E-13	1.09E-10	6.20E-11	**1.42E-11**
Total PeCDD	2.20E-11	7.70E-09	4.40E-09	**1.00E-09**
1,2,3,4,7,8-HxCDD	4.20E-13	1.47E-10	8.40E-11	**1.92E-11**
1,2,3,6,7,8-HxCDD	1.30E-12	4.55E-10	2.60E-10	**5.94E-11**
1,2,3,7,8,9-HxCDD	9.80E-13	3.43E-10	1.96E-10	**4.47E-11**
Total HxCDD	1.20E-11	4.20E-09	2.40E-09	**5.48E-10**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	1.68E-09	9.60E-10	**2.19E-10**
Total HpCDD	1.90E-11	6.65E-09	3.80E-09	**8.68E-10**
Octa CDD	2.50E-11	8.75E-09	5.00E-09	**1.14E-09**
Total PCDD[h]	7.90E-11	2.77E-08	1.58E-08	**3.61E-09**
Furans[e,f]				
2,3,7,8-TCDF	9.70E-13	3.40E-10	1.94E-10	**4.43E-11**
Total TCDF	3.70E-12	1.30E-09	7.40E-10	**1.69E-10**
1,2,3,7,8-PeCDF	4.30E-12	1.51E-09	8.60E-10	**1.96E-10**
2,3,4,7,8-PeCDF	8.40E-13	2.94E-10	1.68E-10	**3.84E-11**
Total PeCDF	8.40E-11	2.94E-08	1.68E-08	**3.84E-09**
1,2,3,4,7,8-HxCDF	4.00E-12	1.40E-09	8.00E-10	**1.83E-10**
1,2,3,6,7,8-HxCDF	1.20E-12	4.20E-10	2.40E-10	**5.48E-11**
2,3,4,6,7,8-HxCDF	1.90E-12	6.65E-10	3.80E-10	**8.68E-11**
1,2,3,7,8,9-HxCDF	8.40E-12	2.94E-09	1.68E-09	**3.84E-10**
Total HxCDF	1.30E-11	4.55E-09	2.60E-09	**5.94E-10**
1,2,3,4,6,7,8-HpCDF	6.50E-12	2.28E-09	1.30E-09	**2.97E-10**
1,2,3,4,7,8,9-HpCDF	2.70E-12	9.45E-10	5.40E-10	**1.23E-10**
Total HpCDF	1.00E-11	3.50E-09	2.00E-09	**4.57E-10**
Octa CDF	4.80E-12	1.68E-09	9.60E-10	**2.19E-10**
Total PCDF[h]	4.00E-11	1.40E-08	8.00E-09	**1.83E-09**
Total PCDD/PCDF[h]	1.20E-10	4.20E-08	2.40E-08	**5.48E-09**
Non-PAH HAPs[f]				
Acetaldehyde[e]	1.30E-03	4.55E-01	2.60E-01	**5.94E-02**
Acrolein[e]	2.60E-05	9.10E-03	5.20E-03	2.71E-03
Benzene[e]	3.90E-04	1.37E-01	7.80E-02	**1.78E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	8.40E-02	4.80E-02	2.50E-02
Formaldehyde[e]	3.10E-03	1.09E+00	6.20E-01	**1.42E-01**
Hexane[e]	9.20E-04	3.22E-01	1.84E-01	9.58E-02
Isooctane	4.00E-05	1.40E-02	8.00E-03	4.17E-03
Methyl Ethyl Ketone[e]	2.00E-05	7.00E-03	4.00E-03	2.08E-03
Pentane[e]				
Propionaldehyde[e]	1.30E-04	4.55E-02	2.60E-02	1.35E-02
Quinone[e]	1.60E-04	5.60E-02	3.20E-02	1.67E-02
Methyl chloroform[e]	4.80E-05	1.68E-02	9.60E-03	5.00E-03
Toluene[e]	2.90E-03	1.02E+00	5.80E-01	3.02E-01
Xylene[e]	2.00E-04	7.00E-02	4.00E-02	2.08E-02
PAH, Total		3.10E-01		**4.04E-02**
POM (7-PAH Group)		1.92E-04		**2.50E-05**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	1.70E-04	5.95E-02	3.40E-02	**7.76E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	4.90E-04	2.80E-04	**6.39E-05**
Acenaphthylene	2.20E-05	7.70E-03	4.40E-03	**1.00E-03**
Anthracene	3.10E-06	1.09E-03	6.20E-04	**1.42E-04**
Benzo(a)anthracene	2.10E-07	7.35E-05	4.20E-05	**9.59E-06**
Benzo(a)pyrene[e]	9.80E-09	3.43E-06	1.96E-06	**4.47E-07**
Benzo(b)fluoranthene	1.00E-07	3.50E-05	2.00E-05	**4.57E-06**
Benzo(e)pyrene	1.10E-07	3.85E-05	2.20E-05	**5.02E-06**
Benzo(g,h,i)perylene	4.00E-08	1.40E-05	8.00E-06	**1.83E-06**
Benzo(k)fluoranthene	4.10E-08	1.44E-05	8.20E-06	**1.87E-06**
Chrysene	1.80E-07	6.30E-05	3.60E-05	**8.22E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.14E-04	1.22E-04	**2.79E-05**
Fluorene	1.10E-05	3.85E-03	2.20E-03	**5.02E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.45E-06	1.40E-06	**3.20E-07**
Naphthalene[e]	6.50E-04	2.28E-01	1.30E-01	**2.97E-02**
Perylene	8.80E-09	3.08E-06	1.76E-06	**4.02E-07**
Phenanthrene	2.30E-05	8.05E-03	4.60E-03	**1.05E-03**
Pyrene	3.00E-06	1.05E-03	6.00E-04	**1.37E-04**
Non-HAP Organic Compounds[f]				
Acetone[e]	8.30E-04	2.91E-01	1.66E-01	8.65E-02
Benzaldehyde	1.10E-04	3.85E-02	2.20E-02	1.15E-02
Butane	6.70E-04	2.35E-01	1.34E-01	6.98E-02
Butyraldehyde	1.60E-04	5.60E-02	3.20E-02	1.67E-02
Crotonaldehyde[e]	8.60E-05	3.01E-02	1.72E-02	8.96E-03
Ethylene	7.00E-03	2.45E+00	1.40E+00	7.29E-01
Heptane	9.40E-03	3.29E+00	1.88E+00	9.79E-01
Hexanal	1.10E-04	3.85E-02	2.20E-02	1.15E-02
Isovaleraldehyde	3.20E-05	1.12E-02	6.40E-03	3.33E-03
2-Methyl-1-pentene	4.00E-03	1.40E+00	8.00E-01	4.17E-01
2-Methyl-2-butene	5.80E-04	2.03E-01	1.16E-01	6.04E-02
3-Methylpentane	1.90E-04	6.65E-02	3.80E-02	1.98E-02
1-Pentene	2.20E-03	7.70E-01	4.40E-01	2.29E-01
n-Pentane	2.10E-04	7.35E-02	4.20E-02	2.19E-02
Valeraldehyde[e]	6.70E-05	2.35E-02	1.34E-02	6.98E-03
Metals[g]				
Antimony[e]	1.80E-07	6.30E-05	3.60E-05	1.88E-05
Arsenic[e]	5.60E-07	1.96E-04	1.12E-04	**2.56E-05**
Barium[e]	5.80E-06	2.03E-03	1.16E-03	6.04E-04
Beryllium[e]				
Cadmium[e]	4.10E-07	1.44E-04	8.20E-05	**1.87E-05**
Chromium[e]	5.50E-06	1.93E-03	1.10E-03	5.73E-04
Cobalt[e]	2.60E-08	9.10E-06	5.20E-06	2.71E-06
Copper[e]	3.10E-06	1.09E-03	6.20E-04	3.23E-04
Hexavalent Chromium[e]	4.50E-07	1.58E-04	9.00E-05	**2.05E-05**
Manganese[e]	7.70E-06	2.70E-03	1.54E-03	8.02E-04
Mercury[e]	2.60E-06	9.10E-04	5.20E-04	2.71E-04
Molybdenum[e]				
Nickel[e]	6.30E-05	2.21E-02	1.26E-02	**2.88E-03**
Phosphorus[e]	2.80E-05	9.80E-03	5.60E-03	2.92E-03
Silver[e]	4.80E-07	1.68E-04	9.60E-05	5.00E-05
Selenium[e]	3.50E-07	1.23E-04	7.00E-05	3.65E-05
Thallium[e]	4.10E-09	1.44E-06	8.20E-07	4.27E-07
Vanadium[e]				
Zinc[e]	6.10E-05	2.14E-02	1.22E-02	6.35E-03

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
SO2 for AP-42 = 0.058. However permit limit = 0.5% S, so it is more appropriate to use the same EF as for used oil at 0.5% S = 0.011
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04
h) Compound is classified as polycyclic organic matter, as defined in the 1990 CAAA. Total PCDD is the sum of the total tetra through octa dioxins; total PCDF is sum of the total tetra through octa furans; and total PCDD/PCDF is the sum of total PCDD and total PCDF.
Pollutants shown in bold/blue text are emitted when using Used Oil but not when using #2 Fuel Oil or Natural Gas.
Pollutants shown in magenta are emitted when using Used Oil or #2 Fuel Oil, but not when using Natural Gas

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.
Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

Facility: **T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs**
12/10/2010 10:13 **Permit/Facility ID: P-2010.Ger 000-00000**

#2 Fuel Oil Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle =	1	User Input Weight % Sulfur = 0.5000%
Hourly Production	350 T/hr	AP-42 EF of 0.011 lb SO2/ton presumed based on #2 oil, max 0.5% sulfur content
Daily Production	2,500 Tons/day	SO2 emissions are multiplied by a factor: User Input Value/0.5% = 1.00
Max Annual Production	400,000 Tons/yr	

*(lb/hr) Maximum based on maximum hourly HMA production, (T/yr) based on maximum annual producton, TAPs based on (T/yr)*2000 lb/T*yr/8760 hrs

*Pollutant	Emission Factor[a] (lb/ton)	*Emissions (lb/hr) Maximum	*Emissions (T/yr)	**TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total) [b]	0.033	11.6	6.6	
PM-10 (total) [b]	0.023	8.1	4.6	
P.M.-2.5 [b1]	*0.0029*			
CO [c]	0.13	45.5	26	
NOx [c]	0.055	19.3	11.0	
SO_2 [c]	0.011	3.85	2.2	
VOC [d]	0.032	11.2	6.4	
Lead	1.50E-05	5.25E-03	3.00E-03	
HCl [d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD	2.10E-13	7.35E-11	4.20E-11	**9.59E-12**
Total TCDD	9.30E-13	3.255E-10	1.86E-10	**4.25E-11**
1,2,3,7,8-PeCDD	3.10E-13	1.085E-10	6.20E-11	**1.42E-11**
Total PeCDD	2.20E-11	7.7E-09	4.40E-09	**1.00E-09**
1,2,3,4,7,8-HxCDD	4.20E-13	1.47E-10	8.40E-11	**1.92E-11**
1,2,3,6,7,8-HxCDD	1.30E-12	4.55E-10	2.60E-10	**5.94E-11**
1,2,3,7,8,9-HxCDD	9.80E-13	3.43E-10	1.96E-10	**4.47E-11**
Total HxCDD	1.20E-11	4.2E-09	2.40E-09	**5.48E-10**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	1.68E-09	9.60E-10	**2.19E-10**
Total HpCDD	1.90E-11	6.65E-09	3.80E-09	**8.68E-10**
Octa CDD	2.50E-11	8.75E-09	5.00E-09	**1.14E-09**
Total PCDD[h]	7.90E-11	2.765E-08	1.58E-08	**3.61E-09**
Furans[e]				
2,3,7,8-TCDF	9.70E-13	3.395E-10	1.94E-10	**4.43E-11**
Total TCDF	3.70E-12	1.295E-09	7.40E-10	**1.69E-10**
1,2,3,7,8-PeCDF	4.30E-12	1.505E-09	8.60E-10	**1.96E-10**
2,3,4,7,8-PeCDF	8.40E-13	2.94E-10	1.68E-10	**3.84E-11**
Total PeCDF	8.40E-11	2.94E-08	1.68E-08	**3.84E-09**
1,2,3,4,7,8-HxCDF	4.00E-12	1.4E-09	8.00E-10	**1.83E-10**
1,2,3,6,7,8-HxCDF	1.20E-12	4.2E-10	2.40E-10	**5.48E-11**
2,3,4,6,7,8-HxCDF	1.90E-12	6.65E-10	3.80E-10	**8.68E-11**
1,2,3,7,8,9-HxCDF	8.40E-12	2.94E-09	1.68E-09	**3.84E-10**
Total HxCDF	1.30E-11	4.55E-09	2.60E-09	**5.94E-10**
1,2,3,4,6,7,8-HpCDF	6.50E-12	2.275E-09	1.30E-09	**2.97E-10**
1,2,3,4,7,8,9-HpCDF	2.70E-12	9.45E-10	5.40E-10	**1.23E-10**
Total HpCDF	1.00E-11	3.5E-09	2.00E-09	**4.57E-10**
Octa CDF	4.80E-12	1.68E-09	9.60E-10	**2.19E-10**
Total PCDF[h]	4.00E-11	1.4E-08	8.00E-09	**1.83E-09**
Total PCDD/PCDF[h]	1.20E-10	4.2E-08	2.40E-08	**5.48E-09**
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	1.37E-01	7.80E-02	**1.78E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	8.40E-02	4.80E-02	2.50E-02
Formaldehyde[e]	3.10E-03	1.09E+00	6.20E-01	**1.42E-01**
Hexane[e]	9.20E-04	3.22E-01	1.84E-01	9.58E-02
Isooctane	4.00E-05	1.40E-02	8.00E-03	4.17E-03
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	1.68E-02	9.60E-03	5.00E-03
Toluene[e]	2.90E-03	1.02E+00	5.80E-01	3.02E-01
Xylene[e]	2.00E-04	7.00E-02	4.00E-02	2.08E-02
PAH, Total		3.10E-01		**4.04E-02**
POM (7-PAH Group)		1.92E-04		**2.50E-05**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr) Maximum	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	0.00017	5.95E-02	3.40E-02	**7.76E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	4.90E-04	2.80E-04	**6.39E-05**
Acenaphthylene	2.20E-05	7.70E-03	4.40E-03	**1.00E-03**
Anthracene	3.10E-06	1.09E-03	6.20E-04	**1.42E-04**
Benzo(a)anthracene	2.10E-07	7.35E-05	4.20E-05	**9.59E-06**
Benzo(a)pyrene[e]	9.80E-09	3.43E-06	1.96E-06	**4.47E-07**
Benzo(b)fluoranthene	1.00E-07	3.50E-05	2.00E-05	**4.57E-06**
Benzo(e)pyrene	1.10E-07	3.85E-05	2.20E-05	**5.02E-06**
Benzo(g,h,l)perylene	4.00E-08	1.40E-05	8.00E-06	**1.83E-06**
Benzo(k)fluoranthene	4.10E-08	1.44E-05	8.20E-06	**1.87E-06**
Chrysene	1.80E-07	6.30E-05	3.60E-05	**8.22E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.14E-04	1.22E-04	**2.79E-05**
Fluorene	1.10E-05	3.85E-03	2.20E-03	**5.02E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.45E-06	1.40E-06	**3.20E-07**
Naphthalene[e]	0.00065	2.28E-01	1.30E-01	**2.97E-02**
Perylene	8.80E-09	3.08E-06	1.76E-06	**4.02E-07**
Phenanthrene	2.30E-05	8.05E-03	4.60E-03	**1.05E-03**
Pyrene	3.00E-06	1.05E-03	6.00E-04	**1.37E-04**
Non-HAP Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.35E-01	1.34E-01	6.98E-02
Butyraldehyde				0.00E+00
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.45E+00	1.40E+00	7.29E-01
Heptane	9.40E-03	3.29E+00	1.88E+00	9.79E-01
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.40E+00	8.00E-01	4.17E-01
2-Methyl-2-butene	5.80E-04	2.03E-01	1.16E-01	6.04E-02
3-Methylpentane	1.90E-04	6.65E-02	3.80E-02	1.98E-02
1-Pentene	2.20E-03	7.70E-01	4.40E-01	2.29E-01
n-Pentane	2.10E-04	7.35E-02	4.20E-02	2.19E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	6.30E-05	3.60E-05	1.88E-05
Arsenic[e]	5.60E-07	1.96E-04	1.12E-04	**2.56E-05**
Barium[e]	5.80E-06	2.03E-03	1.16E-03	6.04E-04
Beryllium[e]				
Cadmium[e]	4.10E-07	1.44E-04	8.20E-05	**1.87E-05**
Chromium[e]	5.50E-06	1.93E-03	1.10E-03	5.73E-04
Cobalt[e]	2.60E-08	9.10E-06	5.20E-06	2.71E-06
Copper[e]	3.10E-06	1.09E-03	6.20E-04	3.23E-04
Hexavalent Chromium[e]	4.50E-07	1.58E-04	9.00E-05	**2.05E-05**
Manganese[e]	7.70E-06	2.70E-03	1.54E-03	8.02E-04
Mercury[e]	2.60E-06	9.10E-04	5.20E-04	2.71E-04
Molybdenum[e]				
Nickel[e]	6.30E-05	2.21E-02	1.26E-02	**2.88E-03**
Phosphorus[e]	2.80E-05	9.80E-03	5.60E-03	2.92E-03
Silver[e]	4.80E-07	1.68E-04	9.60E-05	5.00E-05
Selenium[e]	3.50E-07	1.23E-04	7.00E-05	3.65E-05
Thallium[e]	4.10E-09	1.44E-06	8.20E-07	4.27E-07
Vanadium[e]				
Zinc[e]	6.10E-05	2.14E-02	1.22E-02	6.35E-03

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO. CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04
h) Compound is classified as polycyclic organic matter, as defined in the 1990 CAAA. Total PCDD is the sum of the total tetra through octa dioxins; total PCDF is sum of the total tetra through octa furans; and total PCDD/PCDF is the sum of total PCDD and total PCDF.

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
12/10/2010 10:28 Permit/ Facility ID: P-2010.Gen 000-00000

Natural Gas Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle =	1	
Max Hourly Production	350	Tons/hr
Max Daily Production	2,500	Tons/day
Max Annual Production	400,000	Tons/yr (Proposed Throughput Limit)

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total)[b]	0.033	11.55	6.6	
PM-10 (total)[b]	0.023	8.05	4.6	
P.M.-2.5 [b1]	*0.0029*			
CO [c]	0.13	45.5	26	
NOx [c]	0.026	9.1	5.2	
SO_2 [c]	0.0034	1.19	0.68	
VOC [d]	0.032	11.2	6.4	
Lead	6.20E-07	2.17E-04	1.24E-04	
HCl [d,e]	No Data			
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	1.37E-01	7.80E-02	**1.78E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	8.40E-02	4.80E-02	2.50E-02
Formaldehyde[e]	3.10E-03	1.09E+00	6.20E-01	**1.42E-01**
Hexane[e]	9.20E-04	3.22E-01	1.84E-01	9.58E-02
Isooctane	4.00E-05	1.40E-02	8.00E-03	4.17E-03
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	1.68E-02	9.60E-03	5.00E-03
Toluene[e]	1.50E-04	5.25E-02	3.00E-02	1.56E-02
Xylene[e]	2.00E-04	7.00E-02	4.00E-02	2.08E-02
PAH, Total		6.56E-02		**8.56E-03**
POM (7-PAH Group)		3.97E-02		**5.18E-03**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPS Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	7.40E-05	2.59E-02	1.48E-02	**3.38E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	4.90E-04	2.80E-04	**6.39E-05**
Acenaphthylene	8.60E-06	3.01E-03	1.72E-03	**3.93E-04**
Anthracene	2.20E-07	7.70E-05	4.40E-05	**1.00E-05**
Benzo(a)anthracene	2.10E-07	7.35E-05	4.20E-05	**9.59E-06**
Benzo(a)pyrene[e]	9.80E-09	3.43E-06	1.96E-06	**4.47E-07**
Benzo(b)fluoranthene	1.00E-07	3.50E-05	2.00E-05	**4.57E-06**
Benzo(e)pyrene	1.10E-07	3.85E-05	2.20E-05	**5.02E-06**
Benzo(g,h,i)perylene	4.00E-08	1.40E-05	8.00E-06	**1.83E-06**
Benzo(k)fluoranthene	4.10E-08	1.44E-05	8.20E-06	**1.87E-06**
Chrysene	1.80E-07	6.30E-05	3.60E-05	**8.22E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.14E-04	1.22E-04	**2.79E-05**
Fluorene	3.80E-06	1.33E-03	7.60E-04	**1.74E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.45E-06	1.40E-06	**3.20E-07**
Naphthalene[e]	9.00E-05	3.15E-02	1.80E-02	**4.11E-03**
Perylene	8.80E-09	3.08E-06	1.76E-06	**4.02E-07**
Phenanthrene	7.60E-06	2.66E-03	1.52E-03	**3.47E-04**
Pyrene	5.40E-07	1.89E-04	1.08E-04	**2.47E-05**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.35E-01	1.34E-01	6.98E-02
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.45E+00	1.40E+00	7.29E-01
Heptane	9.40E-03	3.29E+00	1.88E+00	9.79E-01
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.40E+00	8.00E-01	4.17E-01
2-Methyl-2-butene	5.80E-04	2.03E-01	1.16E-01	6.04E-02
3-Methylpentane	1.90E-04	6.65E-02	3.80E-02	1.98E-02
1-Pentene	2.20E-03	7.70E-01	4.40E-01	2.29E-01
n-Pentane	2.10E-04	7.35E-02	4.20E-02	2.19E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	6.30E-05	3.60E-05	1.88E-05
Arsenic[e]	5.60E-07	1.96E-04	1.12E-04	**2.56E-05**
Barium[e]	5.80E-06	2.03E-03	1.16E-03	6.04E-04
Beryllium[e]				
Cadmium[e]	4.10E-07	1.44E-04	8.20E-05	**1.87E-05**
Chromium[e]	5.50E-06	1.93E-03	1.10E-03	5.73E-04
Cobalt[e]	2.60E-08	9.10E-06	5.20E-06	2.71E-06
Copper[e]	3.10E-06	1.09E-03	6.20E-04	3.23E-04
Hexavalent Chromium[e]	4.50E-07	1.58E-04	9.00E-05	**2.05E-05**
Manganese[e]	7.70E-06	2.70E-03	1.54E-03	8.02E-04
Mercury[e]	2.40E-07	8.40E-05	4.80E-05	2.50E-05
Molybdenum[e]				
Nickel[e]	6.30E-05	2.21E-02	1.26E-02	**2.88E-03**
Phosphorus[e]	2.80E-05	9.80E-03	5.60E-03	2.92E-03
Silver[e]	4.80E-07	1.68E-04	9.60E-05	5.00E-05
Selenium[e]	3.50E-07	1.23E-04	7.00E-05	3.65E-05
Thallium[e]	4.10E-09	1.44E-06	8.20E-07	4.27E-07
Vanadium[e]				
Zinc[e]	6.10E-05	2.14E-02	1.22E-02	6.35E-03

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
12/10/2010 10:13 Permit/ Facility ID: P-2010.Gen 000-00000

LPG or Propane Fired Drum Mix Asphalt Plant With Fabric Filter

Fuel Type Toggle =	1	
Max Hourly Production	350	Tons/hr
Max Daily Production	2,500	Tons/day
Max Annual Production	400,000	Tons/yr

Note: Presumes same emissions as natural gas except for NOx (see AP-42, Section 1.5, Liquefied Petroleum Gas Combustion) SO2 emissions from natural gas are ~70% lower than with #2 Fuel Oil, and ~94% lower than with Used Oil or #6 Fuel Oil (minimal impact on emissions, used Nat Gas EF)

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	0.033	11.55	6.6	
PM-10 (total)[b]	0.023	8.05	4.6	
P.M.-2.5 [b1]	*0.0029*			
CO[c]	0.13	45.5	26	
NOx[c1] (Natural Gas EF x 1.5)	0.039	13.65	7.8	
SO_2[c]	0.0034	1.19	0.68	
VOC[d]	0.032	11.2	6.4	
Lead	6.20E-07	0.000217	1.24E-04	
HCl[d,e]	No Data			
Dioxins[e]				
-- No EFs for LP Gas or Propane Fuel --				
Furans[e]				
-- No EFs for LP Gas or Propane Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	1.37E-01	7.80E-02	**1.78E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	8.40E-02	4.80E-02	2.50E-02
Formaldehyde[e]	3.10E-03	1.09E+00	6.20E-01	**1.42E-01**
Hexane[e]	9.20E-04	3.22E-01	1.84E-01	9.58E-02
Isooctane	4.00E-05	1.40E-02	8.00E-03	4.17E-03
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	1.68E-02	9.60E-03	5.00E-03
Toluene[e]	1.50E-04	5.25E-02	3.00E-02	1.56E-02
Xylene[e]	2.00E-04	7.00E-02	4.00E-02	2.08E-02
PAH, Total		6.56E-02		**2.06E-04**
POM (7-PAH Group)		1.92E-04		**2.50E-05**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	7.40E-05	2.59E-02	1.48E-02	**3.38E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	4.90E-04	2.80E-04	**6.39E-05**
Acenaphthylene	8.60E-06	3.01E-03	1.72E-03	**3.93E-04**
Anthracene	2.20E-07	7.70E-05	4.40E-05	**1.00E-05**
Benzo(a)anthracene	2.10E-07	7.35E-05	4.20E-05	**9.59E-06**
Benzo(a)pyrene[e]	9.80E-09	3.43E-06	1.96E-06	**4.47E-07**
Benzo(b)fluoranthene	1.00E-07	3.50E-05	2.00E-05	**4.57E-06**
Benzo(e)pyrene	1.10E-07	3.85E-05	2.20E-05	**5.02E-06**
Benzo(g,h,i)perylene	4.00E-08	1.40E-05	8.00E-06	**1.83E-06**
Benzo(k)fluoranthene	4.10E-08	1.44E-05	8.20E-06	**1.87E-06**
Chrysene	1.80E-07	6.30E-05	3.60E-05	**8.22E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.14E-04	1.22E-04	**2.79E-05**
Fluorene	3.80E-06	1.33E-03	7.60E-04	**1.74E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.45E-06	1.40E-06	**3.20E-07**
Naphthalene[e]	9.00E-05	3.15E-02	1.80E-02	**4.11E-03**
Perylene	8.80E-09	3.08E-06	1.76E-06	**4.02E-07**
Phenanthrene	7.60E-06	2.66E-03	1.52E-03	**3.47E-04**
Pyrene	5.40E-07	1.89E-04	1.08E-04	**2.47E-05**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.35E-01	1.34E-01	6.98E-02
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.45E+00	1.40E+00	7.29E-01
Heptane	9.40E-03	3.29E+00	1.88E+00	9.79E-01
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.40E+00	8.00E-01	4.17E-01
2-Methyl-2-butene	5.80E-04	2.03E-01	1.16E-01	6.04E-02
3-Methylpentane	1.90E-04	6.65E-02	3.80E-02	1.98E-02
1-Pentene	2.20E-03	7.70E-01	4.40E-01	2.29E-01
n-Pentane	2.10E-04	7.35E-02	4.20E-02	2.19E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	6.30E-05	3.60E-05	1.88E-05
Arsenic[e]	5.60E-07	1.96E-04	1.12E-04	**2.56E-05**
Barium[e]	5.80E-06	2.03E-03	1.16E-03	6.04E-04
Beryllium[e]				
Cadmium[e]	4.10E-07	1.44E-04	8.20E-05	**1.87E-05**
Chromium[e]	5.50E-06	1.93E-03	1.10E-03	5.73E-04
Cobalt[e]	2.60E-08	9.10E-06	5.20E-06	2.71E-06
Copper[e]	3.10E-06	1.09E-03	6.20E-04	3.23E-04
Hexavalent Chromium[e]	4.50E-07	1.58E-04	9.00E-05	**2.05E-05**
Manganese[e]	7.70E-06	2.70E-03	1.54E-03	8.02E-04
Mercury[e]	2.40E-07	8.40E-05	4.80E-05	2.50E-05
Molybdenum[e]				
Nickel[e]	6.30E-05	2.21E-02	1.26E-02	**2.88E-03**
Phosphorus[e]	2.80E-05	9.80E-03	5.60E-03	2.92E-03
Silver[e]	4.80E-07	1.68E-04	9.60E-05	5.00E-05
Selenium[e]	3.50E-07	1.23E-04	7.00E-05	3.65E-05
Thallium[e]	4.10E-09	1.44E-06	8.20E-07	4.27E-07
Vanadium[e]				
Zinc[e]	6.10E-05	2.14E-02	1.22E-02	6.35E-03

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers (**Emission Rating Factor E - "Poor"**)
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
c1) AP-42, Table 1.5-1, Emission Factors for LPG Combustion, note (a): "Assumes emissions (except SOx and NOx) are the same, on a heat input basis, as for natural gas combustion. The NOx emission factors have been multiplied by a factor of 1.5, which is the approximate ration of propane/butane NOx emissions to natural gas NOx emissions.
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Asphalt Tank Heater - #2 Oil Fired, Estimated Emissions Using AP42 Sections 11.1 (HMA Plants) & 1.3 (Fuel Oil Combustion)

Fuel Type Toggle =	1		Fuel Input Sulfur Content =	0.0500%
Fuel Consumption Rate	20.58 gal/hr			
Max Daily Operation	8 hr/day			
Max Annual Operation	2,000 hrs/yr			

Pollutant	Emission Factor[a] (lb/gal)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual or** 24-hr Average
PM (total)[b] (filterable+cond)	0.0033	6.79E-02	0.07	
PM-10 (total)[b] (filterable+con	0.0033	6.79E-02	0.07	
P.M.-2.5				
CO[b] ("C" EF Rating Factor)	0.005	1.03E-01	0.10	
NOx[b]	0.02	4.12E-01	0.41	
SO_2[b]				
VOC[d] (TOC EF)	5.56E-04	1.14E-02	1.14E-02	
Lead[f]	1.51E-06	3.11E-05	3.11E-05	
HCl[e]				
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[c]	6.90E-13	1.42E-11	1.42E-11	**3.24E-12**
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]	7.60E-13	1.56E-11	1.56E-11	**3.57E-12**
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]	1.50E-11	3.09E-10	3.09E-10	**7.05E-11**
Total HpCDD[c]	2.00E-11	4.12E-10	4.12E-10	**9.40E-11**
Octa CDD[c]	1.60E-10	3.29E-09	3.29E-09	**7.52E-10**
Total PCDD[c]	2.00E-10	4.12E-09	4.12E-09	**9.40E-10**
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]	3.30E-12	6.79E-11	6.79E-11	**1.55E-11**
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]	4.80E-13	9.88E-12	9.88E-12	**2.26E-12**
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]	2.00E-12	4.12E-11	4.12E-11	**9.40E-12**
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]	9.70E-12	2.00E-10	2.00E-10	**4.56E-11**
Octa CDF[c]	1.20E-11	2.47E-10	2.47E-10	**5.64E-11**
Total PCDF[c]	3.10E-11	6.38E-10	6.38E-10	**1.46E-10**
Total PCDD/PCDF[c]	2.30E-10	4.73E-09	4.73E-09	**1.08E-09**
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	3.50E-06	7.20E-05	7.20E-05	**1.64E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
PAH, Total		4.74E-04		**1.08E-04**
POM (7-PAH Group)		2.06E-06		**4.70E-07**

Pollutant	Emission Factor[a] (lb/gal)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual or** 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c]	5.30E-07	1.09E-05	1.09E-05	**2.49E-06**
Acenaphthylene[c]	2.00E-07	4.12E-06	4.12E-06	**9.40E-07**
Anthracene[c]	1.80E-07	3.70E-06	3.70E-06	**8.46E-07**
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene[c]	1.00E-07	2.06E-06	2.06E-06	**4.70E-07**
Benzo(e)pyrene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a.h)anthracene				
Dichlorobenzene				
Fluoranthene[c]	4.40E-08	9.05E-07	9.05E-07	**2.07E-07**
Fluorene[c]	3.20E-08	6.59E-07	6.59E-07	**1.50E-07**
Indeno(1,2,3-cd)pyrene				
Naphthalene[c,e]	1.70E-05	3.50E-04	3.50E-04	**7.99E-05**
Perylene				
Phenanthrene[c]	4.90E-06	1.01E-04	1.01E-04	**2.30E-05**
Pyrene[c]	3.20E-08	6.59E-07	6.59E-07	**1.50E-07**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals[f]				
Antimony[e]	5.25E-06	1.08E-04	1.08E-04	3.60E-05
Arsenic[e]	1.32E-06	2.72E-05	2.72E-05	**6.20E-06**
Barium[e]	2.57E-06	5.29E-05	5.29E-05	1.76E-05
Beryllium[e]	2.78E-08	5.72E-07	5.72E-07	**1.31E-07**
Cadmium[e]	3.98E-07	8.19E-06	8.19E-06	**1.87E-06**
Chromium[e]	8.45E-07	1.74E-05	1.74E-05	5.80E-06
Cobalt[e]	6.02E-06	1.24E-04	1.24E-04	4.13E-05
Copper[e]	1.76E-06	3.62E-05	3.62E-05	1.21E-05
Hexavalent Chromium[e]	2.48E-07	5.10E-06	5.10E-06	**1.17E-06**
Manganese[e]	3.00E-06	6.17E-05	6.17E-05	2.06E-05
Mercury[e]	1.13E-07	2.33E-06	2.33E-06	7.75E-07
Molybdenum[e]	7.87E-07	1.62E-05	1.62E-05	5.40E-06
Nickel[e]	8.45E-05	1.74E-03	1.74E-03	**3.97E-04**
Phosphorus[e]	9.46E-06	1.95E-04	1.95E-04	6.49E-05
Silver[e]				
Selenium[e]	6.83E-07	1.41E-05	1.41E-05	4.69E-06
Thallium[e]				
Vanadium[e]	3.18E-05	6.54E-04	6.54E-04	2.18E-04
Zinc[e]	2.91E-05	5.99E-04	5.99E-04	2.00E-04

a) Emission factors for criteria pollutants are from AP-42, 1.3, Fuel Oil Combustion, 9/98; all other factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 1.3-1, Criteria Pollutant Emission Factors for Fuel Oil Combustion, 9/98, Boilers < 100 MMBtu, SOx based on max fuel sulfur content
c) AP-42, Table 11.1-13, Emission Factors for Hot Mix Asphalt Hot Oil Systems, 3/04
d) AP-42, Table 1.3-3, Emission Factors for Total Organic Compounds (TOC), Methane, and Nonmethane TOC (NMTOC) from Uncontrolled Fuel Oil Combustion; Comm Boiler
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 1.3-11, Emission Factors for Metals from Uncontrolled No. 6 Fuel Oil Combustion

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
12/10/2010 10:28 Permit/Facility ID: P-2010.Generic 000-00000

Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP42 Section 11.1 (Hot Mix Asphalt Plants)

Fuel Type Toggle = 1
Fuel Consumption Rate 2,765 scf/hr
Max Daily Operation 8 hr/day
Max Annual Operation 2,000 hrs/yr

Note: CO EF per AP-42 Table 1.4.1 for natural gas combustion in boilers is 84 lb/MMscf, a factor of 10 higher than the factor shown in Table 11.1-13
Tank heater CO emissions are based on using 84 lb/MMscf

Pollutant	Emission Factor[a] (lb/scf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)				
PM-10 (total)				
P.M.-2.5				
CO [c]	8.90E-06	2.46E-02	2.46E-02	
NOx				
SO_2				
VOC				
Lead				
HCl [e]				
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	2.60E-08	7.19E-05	7.19E-05	1.64E-05
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
PAH, Total		0.00E+00		0.00E+00
POM (7-PAH Group)		0.00E+00		0.00E+00

Pollutant	Emission Factor[a] (lb/scf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene				
Acenaphthylene				
Anthracene				
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene				
Benzo(e)pyrene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene				
Fluorene				
Indeno(1,2,3-cd)pyrene				
Naphthalene[e]				
Perylene				
Phenanthrene				
Pyrene				
Non-HAPs Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42
b) (reserved)
c) AP-42, Table 11.1-13, Emission Factors for Hot Mix Asphalt Hot Oil Systems, 3/04
d) (reserved)
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
12/10/2010 10:13 Permit/Facility ID: P-2010.Ger 000-00000

Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP42 Section 1.4 (Natural Gas Combustion)

Fuel Type Toggle =	1	
Fuel Consumption Rate	2,765	scf/hr
Max Daily Operation	8	hr/day
Max Annual Operation	2,000	hrs/yr
Heating Value Correction:	1.000	applied to Emissions (lb/hr, T/yr) calculations

Note: CO EF per AP-42 Table 1.4.1 for natural gas combustion in boilers is 84 lb/MMscf, a factor of 10 higher than the factor shown in Table 11.1-13
Tank heater CO emissions are based on using 84 lb/MMscf

Pollutant	Emission Factor[a] (lb/MMscf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total)[c]	7.6	2.10E-02	2.10E-02	
PM-10 (total)[c]	7.6	2.10E-02	2.10E-02	
P.M.-2.5				
CO[b]	**84**	2.32E-01	2.32E-01	
NOx[b]	100	2.76E-01	2.76E-01	
SO_2[c]	0.6	1.66E-03	1.66E-03	
VOC[c]	5.5	1.52E-02	1.52E-02	
Lead[c]	5.00E-04	1.38E-06	1.38E-06	
HCl[e]				
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[c1, e]	2.10E-03	5.81E-06	5.81E-06	**1.33E-06**
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[e]	7.50E-02	2.07E-04	2.07E-04	**4.73E-05**
Hexane[e]	1.80E+00	4.98E-03	4.98E-03	1.66E-03
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[c1, e]	2.60E+00	7.19E-03	7.19E-03	2.40E-03
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c1, e]	3.40E-03	9.40E-06	9.40E-06	3.13E-06
Xylene[e]				
PAH, Total		5.20E-06		**1.19E-06**
POM (7-PAH Group)		3.15E-08		**7.20E-09**

Pollutant	Emission Factor[a] (lb/MMscf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene[c1]	2.40E-05	6.64E-08	6.64E-08	**1.51E-08**
3-Methylchloranthrene[c1, e]	1.80E-06	4.98E-09	4.98E-09	**1.14E-09**
Acenaphthene[c1]	1.80E-06	4.98E-09	4.98E-09	**1.14E-09**
Acenaphthylene[c1]	1.80E-06	4.98E-09	4.98E-09	**1.14E-09**
Anthracene[c1]	2.40E-06	6.64E-09	6.64E-09	**1.51E-09**
Benzo(a)anthracene[c1]	1.80E-06	4.98E-09	4.98E-09	**1.14E-09**
Benzo(a)pyrene[c1, e]	1.20E-06	3.32E-09	3.32E-09	**7.57E-10**
Benzo(b)fluoranthenec[1]	1.80E-06	4.98E-09	4.98E-09	**1.14E-09**
Benzo(e)pyrene				
Benzo(g,h,l)perylene[c1]	1.20E-06	3.32E-09	3.32E-09	**7.57E-10**
Benzo(k)fluoranthene[c1]	1.80E-06	4.98E-09	4.98E-09	**1.14E-09**
Chrysene[c1]	1.80E-06	4.98E-09	4.98E-09	**1.14E-09**
Dibenzo(a,h)anthracene[c1]	1.20E-06	3.32E-09	3.32E-09	**7.57E-10**
Dichlorobenzene[c1]	1.20E-03	3.32E-06	3.32E-06	**7.57E-07**
Fluoranthene[c1]	3.00E-06	8.29E-09	8.29E-09	**1.89E-09**
Fluorene[c1]	2.80E-06	7.74E-09	7.74E-09	**1.77E-09**
Indeno(1,2,3-cd)pyrene[c1]	1.80E-06	4.98E-09	4.98E-09	**1.14E-09**
Naphthalene[c1, e]	6.10E-04	1.69E-06	1.69E-06	**3.85E-07**
Perylene				
Phenanthrene[c1]	1.70E-05	4.70E-08	4.70E-08	**1.07E-08**
Pyrene[c1]	5.00E-06	1.38E-08	1.38E-08	**3.16E-09**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane[c1]	2.10E+00	5.81E-03	5.81E-03	1.94E-03
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals[g]				
Antimony[e]				
Arsenic[d,e]	2.00E-04	5.53E-07	5.53E-07	**1.26E-07**
Barium[d,e]	4.40E-03	1.22E-05	1.22E-05	4.05E-06
Beryllium[e]	1.20E-05	3.32E-08	3.32E-08	**7.57E-09**
Cadmium[d,e]	1.10E-03	3.04E-06	3.04E-06	**6.94E-07**
Chromium[d,e]	1.40E-03	3.87E-06	3.87E-06	1.29E-06
Cobalt[d,e]	8.40E-05	2.32E-07	2.32E-07	7.74E-08
Copper[d,e]	8.50E-04	2.35E-06	2.35E-06	7.83E-07
Hexavalent Chromium[e]				
Manganese[d,e]				
Mercury[d,e]				
Molybdenum[d,e]	1.10E-03	3.04E-06	3.04E-06	1.01E-06
Nickel[d,e]				
Phosphorus[e]				
Silver[e]				
Selenium[d,e]				
Thallium[e]				
Vanadium[d,e]	2.30E-03	6.36E-06	6.36E-06	2.12E-06
Zinc[d,e]				

a) Emission factors are from AP-42
b) AP-42, Table 1.4-1, Emission Factors for NOx and CO from Natural Gas Combustion, 7/98
c) AP-42, Table 1.4-2, Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion, 7/98
c1) AP-42, Table 1.4-3, Emission Factors for Speciated Organic Compounds from Natural Gas Combustion, 7/98
d) AP-42, Table 1.4-4, Emission Factors for Metals from Natural Gas Combustion, 7/98
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
12/10/2010 10:13 **Permit/Facility ID:** P-2010.Generic 000-00000

Silo Filling Operations AP-42 Section 11.1

Emissions Toggle = 1
Max Hourly Production 350 T/hr
Max Daily Production 2,500 Tons/day
Max Annual Production 400,000 Tons/yr

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total) [b]	5.86E-04	0.2051	0.1172	
PM-10 (total) [b]	5.86E-04	0.2051	0.1172	
P.M.-2.5 [b]				
CO [b]	1.18E-03	0.4130	0.2360	
NOx				
SO_2				
VOC [d,g]	1.22E-04	4.27E-02	0.0244	
Lead				
HCl [d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD				
Total HpCDD				
Octa CDD				
Total PCDD[h]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF				
Octa CDF				
Total PCDF[h]				
Total PCDD/PCDF[h]				
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-06	1.36E-03	7.80E-04	1.78E-04
1,3-Butadiene[e]				
Ethylbenzene[e]	4.63E-06	1.62E-03	9.26E-04	4.82E-04
Formaldehyde[e]	8.41E-05	2.94E-02	1.68E-02	0.0038
Hexane[e]	1.22E-05	4.27E-03	2.44E-03	1.27E-03
Isooctane	3.78E-08	1.32E-05	7.56E-06	3.94E-06
Methyl Ethyl Ketone[e]	4.75E-06	1.66E-03	9.51E-04	4.95E-04
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]		0.00E+00	0.00E+00	
Toluene[e]	7.56E-06	2.64E-03	1.51E-03	7.87E-04
Xylene[e]	3.13E-05	1.10E-02	6.26E-03	3.26E-03
PAH, Total		1.01E-02		**1.32E-03**
POM (7-PAH Group)		2.36E-04		**3.08E-05**

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	1.34E-05	4.68E-03	2.68E-03	6.11E-04
3-Methylchloranthrene[e]				
Acenaphthene	1.19E-06	4.18E-04	2.39E-04	5.45E-05
Acenaphthylene	3.55E-08	1.24E-05	7.11E-06	1.62E-06
Anthracene	3.30E-07	1.16E-04	6.60E-05	1.51E-05
Benzo(a)anthracene	1.42E-07	4.98E-05	2.84E-05	6.49E-06
Benzo(a)pyrene[e]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(e)pyrene	2.41E-08	8.44E-06	4.82E-06	1.10E-06
Benzo(g,h,l)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	5.33E-07	1.87E-04	1.07E-04	2.43E-05
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene				
Fluoranthene	3.81E-07	1.33E-04	7.62E-05	1.74E-05
Fluorene	2.56E-06	8.97E-04	5.13E-04	1.17E-04
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene[e]	4.62E-06	1.62E-03	9.24E-04	2.11E-04
Perylene	7.62E-08	2.67E-05	1.52E-05	3.48E-06
Phenanthrene	4.57E-06	1.60E-03	9.14E-04	2.09E-04
Pyrene	1.12E-06	3.91E-04	2.23E-04	5.10E-05
Non-HAP Organic Compounds				
Acetone[e]	6.70E-06	2.35E-03	1.34E-03	6.98E-04
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	1.34E-04	4.69E-02	2.68E-02	1.40E-02
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-14, Predictive Emission Factor Equations for Load-Out and Silo Filling Operations, 3/04 Defaults: (-V) = 0.5 T (°F) = 325

Equation		LOADOUT	SILO FILL
Total PM $EF = 0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)} + 000332+0.00105(-V)e^{((0.0251)(T+460)-20.4}$	=	5.219E-04	5.859E-04 (split addends)
Organic PM $EF = 0.00141(-V)e^{((0.0251)(T+460)-20.43)} + 0.00105(-V)e^{((0.0251)(T+460)-20.43)}$	=	3.409E-04	2.539E-04 (split addends)
TOC PM $EF = 0.0172(-V)e^{((0.0251)(T+460)-20.43)} + 0.0504(-V)e^{((0.0251)(T+460)-20.43)}$	=	4.159E-03	1.219E-02 (split addends)
CO PM $EF = 0.00558(-V)e^{((0.0251)(T+460)-20.43)} + 0.00488(-V)e^{((0.0251)(T+460)-20.43)}$	=	1.349E-03	1.180E-03 (split addends)

e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-15, Speciation Profiles for Load-out, Silo Filling, & Asphalt Storage--Organic Particulate-Based Compounds, 3/04 (EF=Spec% * Organic PM EF)
g) AP-42, Table 11.1-16, Speciation Profiles for Load-out, Silo Filling, &Asphalt Storage--Organic Volatile-Based Compounds, 3/04, (EF=Spec% * TOC PM EF)

Pollutants shown in bold text are carcinogens subject to an annual standard. These lb/hr values are annual averages.

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
12/10/2010 10:13 **Permit/Facility ID:** P-2010.Generi 000-00000

Silo Filling Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle =	1	
Max Hourly Production	350	T/hr
Max Daily Production	2,500	Tons/day
Max Annual Production	400,000	Tons/yr

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
non-PAH HAPs[g]				
Bromomethane[e]	5.97E-07	2.09E-04	0.0001	6.22E-05
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	1.95E-06	6.82E-04	0.0004	2.03E-04
Chloroethane (Ethyl chloride[e])	4.87E-07	1.71E-04	0.0001	5.08E-05
Chloromethane (Methyl chloride[e])	2.80E-06	9.81E-04	0.0006	2.92E-04
Cumene[e]				
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	3.29E-08	1.15E-05	6.58E-06	3.43E-06
MTBE				
Styrene[e]	6.58E-07	2.30E-04	1.32E-04	6.86E-05
Tetrachloroethene (Tetrachloroethylene[e])	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane (Methyl chloroform[e])	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene (Trichloroethylene[e])				
Trichlorofluoromethane				
m-/p-Xylene[e] (added into Xylene[e])	2.44E-05	8.53E-03	0.0049	2.54E-03
o-Xylene[e] (added into Xylene[e])	6.95E-06	2.43E-03	0.0014	7.24E-04
Phenol[e,f]				
Non-HAP Organic Compounds				
Methane	3.17E-03	1.11E+00	0.6337	3.30E-01

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
12/10/2010 10:13 Permit/Facility ID: P-2010.Generi(000-00000

Load-out Operations AP-42 Section 11.1

Emissions Toggle =	1	
Max Hourly Production	350	T/hr
Max Daily Production	2,500	Tons/day
Max Annual Production	400,000	Tons/yr

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total)[b]	5.22E-04	0.183	0.10	
PM-10 (total)[b]	5.22E-04	0.183	0.10	
P.M.-2.5[b]				
CO[b]	1.35E-03	0.472	0.27	
NOx				
SO_2				
VOC[d,g]	3.91E-03	1.368	0.78	
Lead				
HCl[d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD				
Total HpCDD				
Octa CDD				
Total PCDD[h]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF				
Octa CDF				
Total PCDF[h]				
Total PCDD/PCDF[h]				
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	2.16E-06	7.57E-04	4.33E-04	**9.88E-05**
1,3-Butadiene[e]				
Ethylbenzene[e]	1.16E-05	4.08E-03	2.33E-03	1.21E-03
Formaldehyde[e]	3.66E-06	1.28E-03	7.32E-04	**1.67E-04**
Hexane[e]	6.24E-06	2.18E-03	1.25E-03	6.50E-04
Isooctane	7.49E-08	2.62E-05	1.50E-05	7.80E-06
Methyl Ethyl Ketone[e]	2.04E-06	7.13E-04	4.08E-04	2.12E-04
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]	8.73E-06	3.06E-03	1.75E-03	9.10E-04
Xylene[e]	5.03E-05	1.76E-02	1.01E-02	5.24E-03
PAH, Total		7.08E-03		**9.24E-04**
POM (7-PAH Group)		1.61E-04		**2.10E-05**

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	8.11E-06	2.84E-03	1.62E-03	**3.71E-04**
3-Methylchloranthrene[e]				
Acenaphthene	8.86E-07	3.10E-04	1.77E-04	**4.05E-05**
Acenaphthylene	9.55E-08	3.34E-05	1.91E-05	**4.36E-06**
Anthracene	2.39E-07	8.35E-05	4.77E-05	**1.09E-05**
Benzo(a)anthracene	6.48E-08	2.27E-05	1.30E-05	**2.96E-06**
Benzo(a)pyrene[e]	7.84E-09	2.74E-06	1.57E-06	**3.58E-07**
Benzo(b)fluoranthene	2.59E-08	9.07E-06	5.18E-06	**1.18E-06**
Benzo(e)pyrene	2.66E-08	9.31E-06	5.32E-06	**1.21E-06**
Benzo(g,h,I)perylene	6.48E-09	2.27E-06	1.30E-06	**2.96E-07**
Benzo(k)fluoranthene	7.50E-09	2.63E-06	1.50E-06	**3.42E-07**
Chrysene	3.51E-07	1.23E-04	7.02E-05	**1.60E-05**
Dibenzo(a,h)anthracene	1.26E-09	4.42E-07	2.52E-07	**5.76E-08**
Dichlorobenzene				
Fluoranthene	1.70E-07	5.97E-05	3.41E-05	**7.78E-06**
Fluorene	2.63E-06	9.19E-04	5.25E-04	**1.20E-04**
Indeno(1,2,3-cd)pyrene	1.60E-09	5.61E-07	3.20E-07	**7.32E-08**
Naphthalene[e]	4.26E-06	1.49E-03	8.52E-04	**1.95E-04**
Perylene	7.50E-08	2.63E-05	1.50E-05	**3.42E-06**
Phenanthrene	2.76E-06	9.67E-04	5.52E-04	**1.26E-04**
Pyrene	5.11E-07	1.79E-04	1.02E-04	**2.34E-05**
Non-HAP Organic Compounds				
Acetone[e]	1.95E-06	6.81E-04	3.89E-04	2.03E-04
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	2.95E-05	1.03E-02	5.91E-03	3.08E-03
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04

b) AP-42, Table 11.1-14, Predictive Emission Factor Equations for Load-Out and Silo Filling Operations, 3/04

Defaults: (-V) = 0.5 T (°F) = 325

Equation		LOADOUT	SILO FILL
Total PM $EF = 0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)} + 000332+ 0.00105(-V)e^{((0.0251)(T+460)-20.43)}$	=	5.219E-04	5.859E-04 (split addends)
Organic PM $EF = 0.00141(-V)e^{((0.0251)(T+460)-20.43)} + 0.00105(-V)e^{((0.0251)(T+460)-20.43)}$	=	3.409E-04	2.539E-04 (split addends)
TOC PM $EF = 0.0172(-V)e^{((0.0251)(T+460)-20.43)} + 0.0504(-V)e^{((0.0251)(T+460)-20.43)}$	=	4.159E-03	1.219E-02 (split addends)
CO PM $EF = 0.00558(-V)e^{((0.0251)(T+460)-20.43)} + 0.00488(-V)e^{((0.0251)(T+460)-20.43)}$	=	1.349E-03	1.180E-03 (split addends)

e) IDAPA Toxic Air Pollutant

f) AP-42, Table 11.1-15, Speciation Profiles for Load-out, Silo Filling, & Asphalt Storage--Organic Particulate-Based Compounds, 3/04 (EF=Spec% * Organic PM EF)

g) AP-42, Table 11.1-16, Speciation Profiles for Load-out, Silo Filling, &Asphalt Storage--Organic Volatile-Based Compounds, 3/04, (EF=Spec% * TOC PM EF)

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs
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Load-out Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle =	1	
Max Hourly Production	350	T/hr
Max Daily Production	2,500	Tons/day
Max Annual Production	400,000	Tons/yr

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
non-PAH HAPs[a]				
Bromomethane[e]	3.99E-07	1.40E-04	7.99E-05	4.16E-05
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	5.41E-07	1.89E-04	1.08E-04	5.63E-05
Chloroethane (Ethyl chloride[e])	8.73E-09	3.06E-06	1.75E-06	9.10E-07
Chloromethane (Methyl chloride[e])	6.24E-07	2.18E-04	1.25E-04	6.50E-05
Cumene[e]	4.57E-06	1.60E-03	9.15E-04	4.77E-04
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])				
MTBE				
Styrene[e]	3.04E-07	1.06E-04	6.07E-05	3.16E-05
Tetrachloroethene (Tetrachloroethylene[e])	3.20E-07	1.12E-04	6.40E-05	3.34E-05
1,1,1-Trichloroethane (Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])				
Trichlorofluoromethane	5.41E-08	1.89E-05	1.08E-05	5.63E-06
m-/p-Xylene[e] (added into Xylene[e])	1.71E-05	5.97E-03	3.41E-03	1.78E-03
o-Xylene[e] (added into Xylene[e])	3.33E-05	1.16E-02	6.65E-03	3.47E-03
Phenol[e,f]	4.02E-06	1.41E-03	8.05E-04	4.19E-04
Non-HAP Organic Compounds				
Methane	2.70E-04	9.46E-02	5.41E-02	2.82E-02

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: **T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs**
12/10/2010 10:13 **Permit/Facility ID:** **P-2010.Generic 000-00000**

Max Hourly Production	350 T/hr	96% T/hr is Aggregate & RAP =	**336 T/hr**
Max Daily Production	2,500 Tons/day	96% T/day is Aggregate & RAP =	**2,400 T/day**
Max Annual Production	400,000 Tons/yr	96% T/yr is Aggregate & RAP =	**384,000 T/yr**

Fine PM emitted from RAP use is negligible (see assumptions on page 1 of this spreadsheet). Worst case emissions are for 0% RAP

Aggregate Front-end Loader Drop Points, AP-42 13.2.4 (11/06)

$E = k (0.0032) \times (U/5)^{1.3} / (M/2)^{1.4}$ = 1.62E-03   7.65E-04 lb/ton for PM10   1.16E-04 lb/ton for PM2.5

k = particle size multiplier: 0.74 for PM; 0.35 for PM10; 0.053 for PM2.5
U = mean wind speed = **10 mph** Wind speed range for source conditions for Equation 1: 1.3 to 15 mph. Select 10 mph as base case wind speed.
M = moisture content = **5 %**

Moisture Content: STAPPA-ALAPCO-EPA, Emission Inventory Improvement Program, Volume II, Chapter 3, Preferred and Alternative Methods for Estimating Air Emissions from Hot Mix Asphalt Plants, Final Report, July 1996: Aggregate moisture content into dryer typically 3 to 7 %
BAAQMD, Hot Mixing Asphalt Facilities, Engineering Evaluation Template, www.baaqmd.gov/pmt/handbook/s11c02ev.htm: Bulk aggregate moisture content typically stabilizes between 3 and 5% by weight.

Windspeed Variation Factors for AERMOD modeling:				PM10		PM2.5	
Wind Category	Upper windspeed (m/sec)	Avg windspeed (m/sec)	Avg windspeed (mph)	E @ avg mph	F = Eavg mph/ E@10mph	E @ avg mph	mph/ E@10mph
Cat 1:	1.54	0.77	1.72	7.77E-05	0.1016	1.18E-05	0.1016
Cat 2:	3.09	2.32	5.18	3.25E-04	0.4251	4.92E-05	0.4251
Cat 3:	5.14	4.12	9.20	6.87E-04	0.8979	1.04E-04	0.8979
Cat 4:	8.23	6.69	14.95	1.29E-03	1.687	1.95E-04	1.687
Cat 5:	10.80	9.52	21.28	2.04E-03	2.670	3.09E-04	2.670
Cat 6:	14.00	12.40	27.74	2.88E-03	3.767	4.36E-04	3.767

Aggregate Front End Loader Drop Points

Drop to storage pile and drop to bins: **336 T/hr** **2** Transfer Points

Pollutant	Emission Factor (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	1.62E-03	0.54	0.16	0.31	0.07	1.09	0.32	0.62	0.14
PM-10 (total)	7.65E-04	0.26	0.08	0.15	0.03	0.51	1.529E-01	2.936E-01	6.703E-02
P.M.-2.5	1.16E-04	0.04	0.01	0.02	0.01	0.08	0.02	0.04	0.01

Conveyor and Scalping Screen Emission Points

Moisture/Control %:
AP-42 Table 11.19.2-2, Note b. Moisture content of uncontrolled sources ranged from 0.21 to 1.3%
AP-42 Table 11.19.2-2, Note b. Moisture content of controlled (water spray) sources ranged from 0.55 to 2.88% --> ~91.3% control for screening, ~95% control for conveyor transfer
Bulk aggregate for HMA plants typically stabilizes between 3 and 5% by weight--> Apply additional 0% control to lb/hr, etc. for the higher moisture.

Aggregate Weigh Conveyor

Transfer from bins to conveyor and from conveyor to scalping screen: **336 T/hr** **2** Transfer Points

Pollutant	Emission Factor Table 11.19.2-2 CONVEYOR TRANSFER PT CONTROLLED (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.00014	4.70E-02	1.40E-02	2.69E-02	6.14E-03	9.41E-02	2.80E-02	5.38E-02	1.23E-02
PM-10 (total)	4.60E-05	1.55E-02	4.60E-03	8.83E-03	2.02E-03	3.09E-02	9.20E-03	1.77E-02	4.03E-03
P.M.-2.5	1.30E-05	4.37E-03	1.30E-03	2.50E-03	5.70E-04	8.74E-03	2.60E-03	4.99E-03	1.14E-03

Aggregate Scalping Screen, AP-42 11.19 (8/04)

Aggregate flow across scalping screen onto conveyor: **336 T/hr**

Pollutant	Emission Factor Table 11.19.2-2 SCREENING CONTROLLED (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.0022	0.739	0.220	0.422	0.096
PM-10 (total)	0.00074	0.249	0.074	0.142	0.032
P.M.-2.5	5.00E-05	0.017	0.005	0.010	0.002

Aggregate Conveyor to Drum (~top end of the drum)

Aggregate transfer from conveyor to drum dryer (1 transfer point): **336 T/hr**

Pollutant	Emission Factor Table 11.19.2-2 CONVEYOR TRANSFER PT CONTROLLED (lb/ton)	Emissions Per Transfer Point			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.00014	0.047	0.014	2.69E-02	6.14E-03
PM-10 (total)	4.60E-05	0.015	0.005	8.83E-03	2.02E-03
P.M.-2.5	1.30E-05	0.004	0.001	2.50E-03	5.70E-04

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33% hrs

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CRITERIA POLLUTANT MODELING

POUNDS PER HOUR

Maximum Controlled Emissions of Any Pollutant from Drum Mix HMA Plant with Fabric Filter, Tank Heater, Engine, Load-out/Silo/Asphalt Storage

A. Drum Mix Plant: 350 Tons/hour 1,143 Hours/year 400,000 Tons/year — 2,500 Tons/day 7.1 hr/day 1,143 hr/yr

Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected =

#2 Fuel Oil	Used Oil	Natural Gas	LPG/Propane
0.5000% S	0.5000% S		

B. Tank Heater: 2.8200 MMBtu Rate 2,000 Hours/year — 8 hrs/day

Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = ######## #2 Fuel Oil — Natural Gas

C1. Engine: 7.662555645 gal/hour 6000 Hours/year Engine < 25hp — ######## #2 Fuel Oil — 12 hrs/day

C2. Engine: 56.19 gal/hour 6000 Hours/year Engine > 25hp — ######## #2 Fuel Oil — 12 hrs/day

Max 1-hour, 3-hour, and 8-hour averages: permit emissions (HMA/silos/loadout: max hourly HMA prodution, tank heater/engines: actual hours)

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 E1< 175 hp Engine Max Emission Rate for Pollutant (lb/hr) Tier 2 Engine	C2 E2 > 175hp Engine Max Emission Rate for Pollutant (lb/hr) Tier 2 Engine	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from thosa sources.
PM (total)							
PM-10 (total)	8.05	6.79E-02	1.98E-01	0.364	2.05E-01	1.83E-01	
P.M.-2.5							
CO	45.50	2.32E-01	1.98E+00	6.31	4.13E-01	4.72E-01	
NOx	19.25	4.12E-01	1.85E+00	11.88			
SO_2	3.85	0.146	3.05E-02	3.89E-01			
VOC	11.20	1.52E-02	3.78E-01	6.93E-01	4.27E-02	1.37E+00	
Lead	5.25E-03	3.11E-05					

Max 24-hour averages: (permit emissions) * [HMA/silo/load-out ((daily max T/D) / (hourly max T/hr)) / (24 hr/day)] or (tank htr (8hrs actual/24 hrs)] or engines at (24/24) hrs/day]

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 E1<175 hp Engine Max Emission Rate for Pollutant (lb/hr)	C2 E2 > 175 hp Engine Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)							
PM-10 (total)	2.396E+00	2.264E-02	9.921E-02	1.819E-01	6.103E-02	5.437E-02	
P.M.-2.5							
CO							
NOx							
SO_2	1.146E+00	4.870E-02	1.523E-02	1.944E-01			
VOC							
Lead							

Max Annual averages: (permit emissions) * {HMA and loadout [(daily max T/D)/(hourly max T/hr)]/8760 hrs/yr} OR {silo [(max tons/year) / 8760 hr/yr]} OR {htr/engines at input hrs/yr / 8760 }

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 E1< 175 hp Engine Max Emission Rate for Pollutant (lb/hr)	C2 E2 > 175 hp Engine Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)							
PM-10 (total)	1.050E+00	1.551E-02	1.359E-01	2.492E-01	2.675E-02	2.383E-02	
P.M.-2.5							
CO							
NOx	2.511E+00	9.397E-02	1.268E+00	8.139E+00			
SO_2	5.023E-01	3.336E-02	2.086E-02	2.663E-01			
VOC							
Lead							

Facility: T2, 175 + 1350 hp ICEs, 0.5S HMA, 0.0015S engine/htr, 6000 hrs, heater @ 33

12/10/2010 10:13 **Permit/Facility ID:** P-2010.Generic 000-00000

TAPs MODELING
POUNDS PER HOUR

Maximum Controlled Emissions of Any Pollutant from Drum Mix HMA Plant with Fabric Filter, Tank Heater, Engine, Load-out/Silo/Asphalt Storage

A. Drum Mix Plant: 350 Tons/hour 1,143 Hours/year 400,000 Tons/year 2,500 Tons/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas LPG/Propane
B. Tank Heater: 2.8200 MMBtu Rat 2,000 Hours/year 8 hrs/day
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Natural Gas
C. E2 Engine: 56.1920747 gal/hour 6000 Hours/year Engine > 25bhp #2 Fuel Oil 12 hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C E1 + E2 Engine Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)
PM (total)					
PM-10 (total)					
P.M.-2.5					
CO					
NOx					
SO_2					
VOC					
Lead					
HCl [e]	7.35E-02	0.00E+00			
Dioxins [e]					
2,3,7,8-TCDD	7.35E-11				
Total TCDD	3.26E-10				
1,2,3,7,8-PeCDD	1.09E-10				
Total PeCDD	7.70E-09				
1,2,3,4,7,8-HxCDD	1.47E-10	1.42E-11			
1,2,3,6,7,8-HxCDD	4.55E-10				
1,2,3,7,8,9-HxCDD	3.43E-10	1.56E-11			
Total HxCDD	4.20E-09				
1,2,3,4,6,7,8-Hp-CDD	1.68E-09	3.09E-10			
Total HpCDD	8.68E-10	4.12E-10			
Octa CDD	1.14E-09	7.52E-10			
Total PCDD [h]	3.61E-09	9.40E-10			
Furans [e]					
2,3,7,8-TCDF	4.43E-11				
Total TCDF	1.69E-10	1.55E-11			
1,2,3,7,8-PeCDF	1.96E-10				
2,3,4,7,8-PeCDF	3.84E-11				
Total PeCDF	3.84E-09	2.26E-12			
1,2,3,4,7,8-HxCDF	1.83E-10				
1,2,3,6,7,8-HxCDF	5.48E-11				
2,3,4,6,7,8-HxCDF	8.68E-11				
1,2,3,7,8,9-HxCDF	3.84E-10				
Total HxCDF	5.94E-10	9.40E-12			
1,2,3,4,6,7,8-HpCDF	2.97E-10				
1,2,3,4,7,8,9-HpCDF	1.23E-10				
Total HpCDF	4.57E-10	4.56E-11			
Octa CDF	2.19E-10	5.64E-11			
Total PCDF [h]	1.83E-09	1.46E-10			
Total PCDD/PCDF [h]	5.48E-09	1.08E-09			
Non-PAH HAPs					
Acetaldehyde [e]	5.94E-02		6.85E-04		
Acrolein [e]	2.71E-03		4.86E-05		
Benzene [e]	1.78E-02	1.33E-06	4.76E-03	1.78E-04	9.88E-05
1,3-Butadiene [e]			2.81E-05		
Ethylbenzene [e]	2.50E-02			4.82E-04	1.21E-03
Formaldehyde [e]	1.42E-01	4.73E-05	1.26E-03	3.84E-03	1.67E-04
Hexane [e]	9.58E-02	1.66E-03		1.27E-03	6.50E-04
Isooctane	4.17E-03			3.94E-06	7.80E-06
Methyl Ethyl Ketone [e]	2.08E-03			4.95E-04	2.12E-04
Pentane [e]		2.40E-03			
Propionaldehyde [e]	1.35E-02				
Quinone [e]	1.67E-02				
Methyl chloroform [e]	5.00E-03				
Toluene [e]	3.02E-01	3.13E-06	1.30E-03	7.87E-04	9.10E-04
Xylene [e]	2.08E-02		8.93E-04	3.26E-03	5.24E-03
PolycyclicOrganic Matter [d,e]	2.50E-05	4.76E-07	2.62E-05	3.08E-05	2.10E-05
TOTAL PAH HAPs	4.04E-02	1.09E-04	1.24E-03	1.32E-03	9.24E-04

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C E1 + E2 Engine Max Emission Rate for Pollutant (lb/hr)	D Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)
PAH HAPs					
2-Methylnaphthalene	7.76E-03	1.51E-08	0.00E+00	6.11E-04	3.71E-04
3-Methylchloranthrene [e]	0.00E+00	1.14E-09	0.00E+00		
Acenaphthene	6.39E-05	2.49E-06	2.57E-05	5.45E-05	4.05E-05
Acenaphthylene	1.00E-03	9.40E-07	5.23E-05	1.62E-06	4.36E-06
Anthracene	1.42E-04	8.46E-07	7.83E-06	1.51E-05	1.09E-05
Benzo(a)anthracene [e]	9.59E-06	1.14E-09	4.49E-06	6.49E-06	2.96E-06
Benzo(a)pyrene [e]	4.47E-07	7.57E-10	1.49E-06	0.00E+00	3.58E-07
Benzo(b)fluoranthene [e]	4.57E-06	4.70E-07	5.93E-06	0.00E+00	1.18E-06
Benzo(e)pyrene	5.02E-06	0.00E+00	0.00E+00	1.10E-06	1.21E-06
Benzo(g,h,l)perylene	1.83E-06	7.57E-10	3.28E-06	0.00E+00	2.96E-07
Benzo(k)fluoranthene [e]	1.87E-06	1.14E-09	1.26E-06	0.00E+00	3.42E-07
Chrysene [e]	8.22E-06	1.14E-09	8.32E-06	2.43E-05	1.60E-05
Dibenze(a,h)anthracene [e]	0.00E+00	7.57E-10	2.24E-06	0.00E+00	5.76E-08
Dichlorobenzene	0.00E+00	7.57E-07	0.00E+00		
Fluoranthene	2.79E-05	2.07E-07	2.67E-05	1.74E-05	7.78E-06
Fluorene	5.02E-04	1.50E-07	8.85E-05	1.17E-04	1.20E-04
Indeno(1,2,3-cd)pyrene [e]	3.20E-07	1.14E-09	2.45E-06	0.00E+00	7.32E-08
Naphthalene [e]	2.97E-02	7.99E-05	7.47E-04	2.11E-04	1.95E-04
Perylene	4.02E-07	0.00E+00	0.00E+00	3.48E-06	3.42E-06
Phenanthrene	1.05E-03	2.30E-05	2.36E-04	2.09E-04	1.26E-04
Pyrene	1.37E-04	1.50E-07	2.30E-05	5.10E-05	2.34E-05
Non-HAP Organic Compounds					
Acetone [e]	8.65E-02	0.00E+00		6.98E-04	2.03E-04
Benzaldehyde	1.15E-02	0.00E+00			
Butane	6.98E-02	1.94E-03			
Butyraldehyde	1.67E-02	0.00E+00			
Crotonaldehyde [e]	8.96E-03	0.00E+00			
Ethylene	7.29E-01	0.00E+00		1.40E-02	3.08E-03
Heptane	9.79E-01	0.00E+00			
Hexanal	1.15E-02	0.00E+00			
Isovaleraldehyde	3.33E-03	0.00E+00			
2-Methyl-1-pentene	4.17E-01	0.00E+00			
2-Methyl-2-butene	6.04E-02	0.00E+00			
3-Methylpentane	1.98E-02	0.00E+00			
1-Pentene	2.29E-01	0.00E+00			
n-Pentane	2.19E-02	0.00E+00			
Valeraldehyde [e]	6.98E-03	0.00E+00			
Metals					
Antimony [e]	1.88E-05	3.60E-05			
Arsenic [e]	2.56E-05	6.20E-06			
Barium [e]	6.04E-04	1.76E-05			
Beryllium [e]	0.00E+00	1.31E-07			
Cadmium [e]	1.87E-05	1.87E-06			
Chromium [e]	5.73E-04	5.80E-06			
Cobalt [e]	2.71E-06	4.13E-05			
Copper [e]	3.23E-04	1.21E-05			
Hexavalent Chromium [e]	2.05E-05	1.17E-06			
Manganese [e]	8.02E-04	2.06E-05			
Mercury [e]	2.71E-04	7.75E-07			
Molybdenum [e]	0.00E+00	5.40E-06			
Nickel [e]	2.88E-03	3.97E-04			
Phosphorus [e]	2.92E-03	6.49E-05			
Silver [e]	5.00E-05	0.00E+00			
Selenium [e]	3.65E-05	4.69E-06			
Thallium [e]	4.27E-07	0.00E+00			
Vanadium [e]	0.00E+00	2.18E-04			
Zinc [e]	6.35E-03	2.00E-04			

e) IDAPA Toxic Air Pollutant

Criteria Pollutant lb/hr emissions are maximum 1-hr averages

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: October 20, 2010

TO: Carole Zundel, Permit Writer, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

PROJECT: P-2010.0060 PROJ60565. PTC Application for the LeGrand Johnson Construction Company Portable Hot Mix Asphalt Plant

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs)

1.0 Summary

LeGrand Johnson Construction Company (LeGrand/Johnson) submitted a Permit to Construct (PTC) application for a portable hot mix asphalt (HMA) plant to be operated in Idaho. Non-site-specific air quality impact analyses involving atmospheric dispersion modeling of emissions associated with the HMA plant were performed by DEQ to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 and 203.03 [Idaho Air Rules Section 203.02 and 203.03]). LeGrand/Johnson submitted applicable information and data enabling DEQ to perform non-site-specific ambient impact analyses.

DEQ performed non-site-specific air quality impact analyses to assure compliance with air quality standards for the LeGrand/Johnson HMA plant. Results from DEQ's atmospheric dispersion modeling were used to establish minimum setback distances between emissions points and the property boundary of the site. The submitted information, in combination with DEQ's air quality analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all locations outside of the required setback distance (closest distance from pollutant emissions points to the property boundary). Table 1 presents key assumptions and results to be considered in the development of the permit.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information, in combination with DEQ's analyses, demonstrated to the satisfaction of the Department that operation of the proposed facility or modification will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Maximum HMA throughput does not exceed 350 ton HMA/hour and 400,000 ton HMA/year.	Short-term and annual modeling was performed assuming these rates.
Daily HMA production is restricted according to the available setback distance at the site (distance between any emissions points and the nearest property boundary), as follows: - Up to 2,500 ton/day for a setback of greater than 69 meters. - Up to 5,000 ton/day for a setback of greater than 103 meters.	These setback distances are necessary to assure compliance with applicable air quality standards at all ambient air locations.
HMA daily production is half the stated value for the winter season (December 1 through March 31).	Substantially greater setback distances would be needed if full production was assumed for the winter season.
The HMA plant will not locate to a site where there are co-contributing emissions sources such as other CBPs, HMAs, or rock crushing plants within 1,000 feet of emissions points, except as noted below for a rock crushing plant. However, NAAQS compliance is assured for the HMA plant with a co-contributing rock crushing plant, without increased setback distances, provided it is not operated during any day when the HMA plant is operated and the annual throughput of the rock crushing plant is less than 500,000 ton/year.	Emissions are considered co-contributing if they occur within 1,000 feet (305 meters) of each other. Once the HMA plant is established at a specific site, that facility is not responsible for controlling other facilities from moving in nearby, provided they are not on the same property. Neighboring facilities would be required to account for the HMA impacts for their own permitting analyses.
DEQ modeling staff contend that NAAQS compliance is assured for the HMA plant operating simultaneously (both within a given day) with a crushing plant, provided HMA daily throughput for that day is limited to half that normally allowed.	Decreased HMA throughput will offset potential impacts of a nearby crushing plant.
Large diesel engine powering an 800 kW generator: rated at < 1,100 bph; maximum sulfur content of fuel = 0.05% sulfur by weight.	Different combinations can be used if it is demonstrated that total emissions from generators are less than those modeled for these sources.
Small diesel engine powering a 75 kW generator: rated at <150 bhp; maximum sulfur content of fuel = 0.05% sulfur by weight.	Different combinations can be used if it is demonstrated that total emissions from generators are less than those modeled for these sources.
Fugitive emissions from material handling and vehicle traffic are controlled to a high degree.	Control of conveyor transfers and screening are equivalent to that achieved by a water spray.
The HMA plant is not located in any non-attainment areas.	All analyses performed assumed the facility will be located in areas attaining air quality standards.
Emissions rates for applicable averaging periods are not greater than those used in the modeling analyses, as listed in this memorandum.	Emissions may vary according to available setback as indicated in this memo.
Stack heights for the drum dryer, tank heater, and generator are as listed in this memorandum or higher.	NAAQS compliance is still assured if actual stack heights are greater than those listed in this memo.
NAAQS compliance is assured provided stack parameters of exhaust temperature and flow rate are not less than about 75 percent of values listed in this memorandum.	Higher temperatures and flow rates increase plume rise, allowing the plume to disperse to a larger degree before impacting ground level.
T-RACT is used for all TAP emissions sources except diesel engines (which are not applicable for those TAPs modeled, since they are subject to 40 CFR 63.zzzz or iiii)	Setback distances would be substantially greater if DEQ does not concur that T-RACT was used to control TAP emissions.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The HMA plant will be a portable facility. The HMA plant will only locate in areas designated as attainment or unclassifiable for all criteria pollutants.

2.1.2 Significant and Cumulative NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the proposed facility exceed the significant impact levels (SILs) of Idaho Air Rules Section 006.105 (referred to as a significant contribution in Idaho Air Rules), then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02. A cumulative NAAQS impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any nearby co-contributing sources, to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled value that must be used for comparison to the NAAQS.

New source review requirements for assuring compliance with $PM_{2.5}$ standards have not yet been completed and promulgated into Idaho regulation. EPA has asserted through a policy memorandum (October 23, 1997) that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding PM_{10} standard. DEQ allows a direct surrogate use of PM_{10} modeling results rather than the adjustments and justifications for surrogate use as suggested by the EPA March 23, 2010, Page Memo (memorandum from Stephen Page, Director of Office of Air Quality Planning and Standards, EPA, *Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS*, March 23, 2010). Although the PM_{10} annual standard was revoked in 2006, compliance with the revoked PM_{10} annual standard must be demonstrated as a surrogate to the annual $PM_{2.5}$ standard.

New NO_2 and SO_2 short-term standards have recently been promulgated by EPA. These standards will not be applicable for permitting purposes in Idaho until they are incorporated by reference into Idaho Air Rules (Spring 2011).

DEQ used non-site-specific full impact analyses to demonstrate compliance with Idaho Air Rules Section 203.02. Established setback distances are minimal distances between any emissions points and the ambient air boundary (usually the property boundary) needed to assure compliance with standards, considering the impact of the HMA plant and a conservative background value.

Table 2. APPLICABLE REGULATORY LIMITS				
<u>Pollutant</u>	Averaging Period	Significant Impact Levels[a] (μg/m³)[b]	Regulatory Limit[c] (μg/m³)	Modeled Value Used[d]
PM_{10}[e]	Annual[f]	1.0	50[g]	Maximum 1st highest[h]
	24-hour	5.0	150[i]	Maximum 6th highest[j]
$PM_{2.5}$[k]	Annual	0.3	15[l]	Use PM_{10} as surrogate
	24-hour	1.2	35[m]	Use PM_{10} as surrogate
Carbon monoxide (CO)	8-hour	500	10,000[n]	Maximum 2nd highest[h]
	1-hour	2,000	40,000[n]	Maximum 2nd highest[h]
Sulfur Dioxide (SO_2)	Annual	1.0	80[g]	Maximum 1st highest[h]
	24-hour	5	365[n]	Maximum 2nd highest[h]
	3-hour	25	1,300[n]	Maximum 2nd highest[h]
	1-hour	Not established	75 ppb[o]	Mean of maximum 4th highest[p]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[g]	Maximum 1st highest[h]
	1-hour	Not established	100ppb[q]	Mean of maximum 8th highest[r]
Lead (Pb)	Quarterly	NA	1.5[g]	Maximum 1st highest[h]
	3-month[s]	NA	0.15[g]	Maximum 1st highest[h]

a. Idaho Air Rules Section 006.105.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.03.b.
d. The maximum 1st highest modeled value is always used for the significant impact analysis.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers.
f. The annual PM_{10} standard was revoked in 2006. The standard is still listed because compliance with the annual $PM_{2.5}$ standard is demonstrated by a PM_{10} analysis that demonstrates compliance with the revoked PM_{10} standard.
g. Not to be exceeded in any calendar year.
h. Concentration at any modeled receptor.
i. Never expected to be exceeded more than once in any calendar year.
j. Concentration at any modeled receptor when using five years of meteorological data.
k. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
l. 3-year average of annual concentration.
m. 3-year average of the upper 98th percentile of 24-hour concentrations.
n. Not to be exceeded more than once per year.
o. 3-year average of the upper 99th percentile of the distribution of maximum daily 1-hour concentrations.
p. Mean (of 5 years of data) of the maximum of 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled.
q. 3-year average of the upper 98th percentile of the distribution of maximum daily 1-hour concentrations.
r. Mean (of 5 years of data) of the maximum of 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled.
s. 3-month rolling average.

2.1.3 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permit requirements for toxic air pollutants from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.

Per Section 210, if the total project-wide emissions increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated. If DEQ determines T-RACT is used to control emissions of carcinogenic TAPs, then modeled concentrations of 10 times the AACC are considered acceptable, as per Idaho Air Rules Section 210.12.

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Table 3 lists appropriate background concentrations for rural Idaho areas.

Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations in the DEQ non-site-specific analyses were based on DEQ default values for rural/agricultural areas.

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	73
	Annual	26
Carbon monoxide (CO)	1-hour	3,600
	8-hour	2,300
Sulfur dioxide (SO_2)	3-hour	34
	24-hour	26
	Annual	8
Nitrogen dioxide (NO_2)	Annual	17
Lead (Pb)	Quarterly	0.03

a. Micrograms per cubic meter.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

This section describes the modeling methods used by DEQ to demonstrate compliance with applicable air quality standards.

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

3.1.1 Overview of Analyses

DEQ performed non-site-specific analyses that were determined to be reasonably representative of the proposed HMA plant, and the results demonstrated compliance with applicable air quality standards to DEQ's satisfaction.

Table 4 provides a brief description of parameters used in the DEQ modeling analyses.

Table 4. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Portable	Can only locate in attainment or unclassifiable areas
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 09292
Meteorological Data	Multiple Data Sets	See Section 3.1.4
Terrain	Flat	The analyses assumed flat terrain for the immediate area
Building Downwash	Considered	A structure of 3 m X 2.5 m X 3 m high was assumed for downwash consideration, representing a large generator.
Receptor Grid	Grid 1	5-meter spacing along the property boundary out 100 meters
	Grid 2	10-meter spacing out to 200 meters

3.1.2 Modeling protocol and Methodology

A modeling protocol was not submitted to DEQ prior to the application because DEQ staff performed the non-site-specific air quality impact analyses rather than the applicant. Non-site-specific modeling was generally conducted using data and methods described in the *State of Idaho Air Quality Modeling Guideline*.

Because of the portable nature of the HMA plant, DEQ performed non-site-specific modeling to establish setback distances between locations of emissions points and the property boundary of the proposed HMA plant. HMA throughput rates, equipment specifications, and emissions release parameters were provided to DEQ by the applicant.

3.1.3 Model Selection

Idaho Air Rules Section 202.02 require that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. EPA provided a 1-year transition period during which either ISCST3 or AERMOD could be used at the discretion of the permitting agency. AERMOD must be used for all air impact analyses, performed in support of air quality permitting, conducted after November 2006.

AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD offers the following improvements over ISCST3:

- Improved dispersion in the convective boundary layer and the stable boundary layer
- Improved plume rise and buoyancy calculations

- Improved treatment of terrain affects on dispersion
- New vertical profiles of wind, turbulence, and temperature

AERMOD was used for the DEQ analyses to evaluate impacts of the proposed HMA plant.

3.1.4 Meteorological Data

Because of the portable nature of HMA plants, DEQ used seven different meteorological data sets from various locations in Idaho to assure compliance with applicable standards for the non-site-specific analyses. Table 5 lists the meteorological data sets used in the air impact analyses.

Table 5. METEOROLOGICAL DATA SETS USED IN MODELING ANALYSES

Surface Data	Upper Air Data	Years
Boise	Boise	2001-2005
Aberdeen	Boise	2001-2005
Idaho Falls	Boise	2000-2004
Minidoka	Boise	2000-2004
Soda Springs	Boise	2004-2008
Lewiston	Spokane, Wa	1992-1995, 1997
Sandpoint	Spokane, Wa	2002-2006

Use of representative meteorological data is of greater concern when using AERMOD than when using ISCST3. This is because AERMOD uses site-specific surface characteristics to more accurately account for turbulence. To account for this uncertainty, the following measures were taken:

- Use the maximum of 2nd high modeled concentrations to evaluate compliance with the 24-hour PM_{10} standard, rather than the maximum of 6th high modeled concentrations typically used when modeling a five-year meteorological data set to demonstrate that the standard will not be exceeded more than once per year on average over a five year period.

- Use the maximum of 1st high modeled concentration to evaluate compliance with all pollutants and averaging times, except for 24-hour PM_{10}.

3.1.5 Terrain Effects

Terrain effects on dispersion were not considered in the non-site-specific analyses. Assuming flat terrain is not a critical limitation of the analyses because most emissions points associated with HMA plants are near ground-level and the immediate surrounding area is typically flat for dispersion modeling purposes. Emissions sources near ground-level typically have maximum pollutant impacts near the source, minimizing the potential affect of surrounding terrain to influence the magnitude of maximum modeled impacts.

3.1.6 Facility Layout

DEQ's analyses used a conservative generic facility layout. This was done because the specific layout will vary depending upon product needs and specific characteristics of the site. To provide conservative results, DEQ used a tight grouping of emissions sources. Sources were positioned within 2.5 meters of the center of the facility.

3.1.7 Building Downwash

Downwash effects caused by the generator housing were accounted for by including the generator structure as a building with dimensions of 3.0 meter by 2.5 meter by 3.0 meter high.

Downwash effects from other structures at the site were not accounted for because of the following:

- Determining a building configuration is extremely difficult given the portable nature of the facility.
- Much of the equipment is porous with regard to wind, thereby minimizing downwash effects.

3.1.8 Ambient Air Boundary

DEQ's non-site-specific analyses, using a generic facility layout, were used to generate minimum setback distances between emissions points and the property boundary or the established boundary to ambient air (if not the same as the property boundary). Ambient air is any area where the general public (anyone not under direct control of the HMA plant) has access. The issued permit will specify throughput restrictions as a function of the setback from ambient air available at any specific site.

3.1.9 Receptor Network and Generation of Setback Distances

Setback distances were determined by first modeling the plant using a dense receptor grid. Results were then reviewed to find the receptor furthest from any emissions point that shows an exceedance of the standard when combined with a background value. The setback distance was calculated as the maximum distance between the next furthest receptor and any emissions point.

A circular grid with 5.0 meter receptor spacing, extending out to at least 100 meters, was used in the non-site-specific modeling performed by DEQ. A secondary grid with 10-meter spacing, extending out to about 200 meters, was used for larger production scenarios to assure the maximum impact was captured by the modeling run. To establish a setback distance, the following procedure was followed for various production levels and operational configurations:

1) Trigger values for the modeling analyses were determined. These are values, when combined with background concentrations, indicated an exceedance of a standard. They were calculated by subtracting the background value from the standard (because the model does not specifically include background in the results). The following are trigger values:

PM_{10}	24-hour	77 $\mu g/m^3$
	annual	24 $\mu g/m^3$
SO_2	3-hour	1266 $\mu g/m^3$
	24-hour	339 $\mu g/m^3$
	annual	72 $\mu g/m^3$
CO	1-hour	36400 $\mu g/m^3$
	8-hour	7700 $\mu g/m^3$
NO_2	annual	83 $\mu g/m^3$

2) For each operational configuration scenario, pollutant, averaging period, and meteorological data set, all receptors with concentrations equal or greater than the trigger value were plotted. This effectively gave a plot of receptors where the standard could be exceeded for that pollutant and averaging period.

3) The controlling receptor for each pollutant, averaging period, and meteorological data set was identified. First, the receptor having a concentration in excess of the trigger value that was furthest from any emissions point was identified. The controlling receptor was the next furthest downwind receptor from that point.

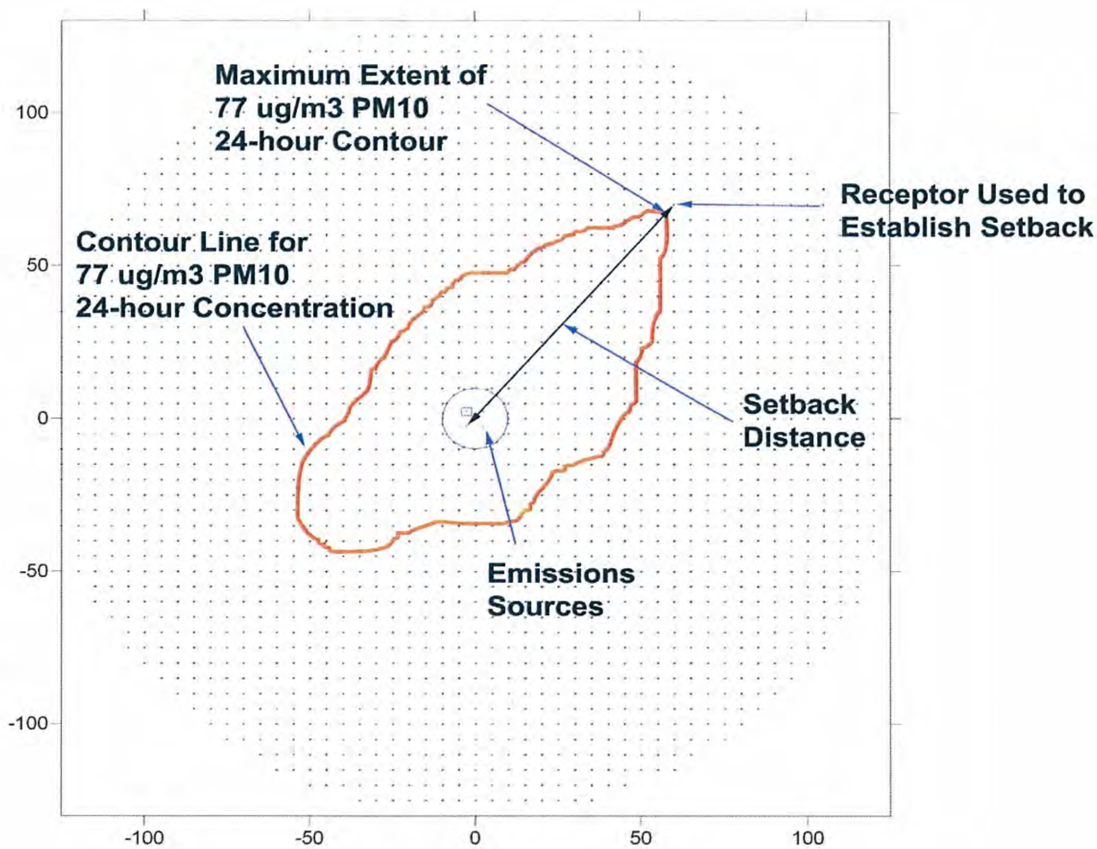
4) The minimum setback distance was calculated. This was the furthest distance between an emissions point and the controlling receptor.

Figure 1 shows how setback distances are determined for a specific modeling run. Emissions points are grouped in a cluster at the center within a 5.0 meter square area. The contour line shows the extent of modeled concentrations exceeding the trigger value for 24-hour PM_{10}. The point on the contour line that is the furthest from the emissions points is identified, and then the controlling receptor is identified as the next furthest receptor beyond that point. The setback distance is determined from the coordinates of the controlling receptor according to the following (with the center of the emissions points at 0.0 meters Northing and 0.0 meters Easting):

$$\text{Distance} = \sqrt{\left(\left|\text{Northing Coordinate}\right| + 3\right)^2 + \left(\left|\text{Easting Coordinate}\right| + 3\right)^2}$$

The factor of 3 in the equation accounts for an emissions point located on the opposite side of the facility center from where the maximum impact is (at -2.5 meters Easting, -2.5 meters Northing if the maximum setback distance is in the direction of positive easting and northing coordinates).

Figure 1 - Determination of Setback Distance for a Modeling Run



3.2 Emission Rates

Emissions rates of criteria pollutants and TAPs were calculated for two HMA plant daily production rates and operational configurations for various applicable averaging periods.

3.2.1 Criteria Pollutant Emissions Rates

Table 6 lists criteria pollutant emissions rates used in the DEQ non-site-specific modeling analyses for the HMA plant described by the applicant. Attachment 1 provides additional details of DEQ emissions calculations.

Table 6. EMISSIONS USED IN DEQ ANALYSES				
Emissions Point in Model	**Pollutant**	**Averaging Period**	**Emissions Rate (lb/hr)**	
			350 ton/hr 2,500 ton/day[a] 400,000 ton/yr	**5,000 ton/day[a]**
DRYER – drum dryer/mixer - emissions controlled by a baghouse	PM_{10}	24-hour	2.396	4.792
		annual	1.050	
	CO	1-hour 8-hour	45.50	
	SO_2	3-hour	3.850	
		24-hour	1.146	2.292
		Annual	0.5023	
	NOx	annual	2.511	
SILO – asphalt storage silo	PM_{10}	24-hour	0.06103	0.1221
		annual	0.02675	
	CO	1-hour 8-hour	0.4130	
LOAD – asphalt loadout	PM_{10}	24-hour	0.05437	0.1087
		annual	0.02383	
	CO	1-hour 8-hour	0.4722	
HOTOIL[b] – asphalt oil heater	PM_{10}	24-hour	0.02264	0.02264
		annual	0.01551	
	CO	1-hour 8-hour	0.2322	
	SO_2	3-hour	0.1461	
		24-hour	0.04870	0.04870
		Annual	0.03336	
	NOx	annual	0.09397	
GEN1[c] – electrical generator	PM_{10}	24-hour	0.4883	0.4883
		annual	0.4883	
	CO	1-hour 8-hour	6.545	
	SO_2	3-hour	0.3889	
		24-hour	0.1944	0.1944
		Annual	0.1944	
	NOx	annual	12.32	
GEN2[c] – electrical generator	PM_{10}	24-hour	0.1628	0.1628
		annual	0.1628	
	CO	1-hour 8-hour	0.9975	
	SO_2	3-hour	0.3045	
		24-hour	0.1523	0.1523
		Annual	0.1523	
	NOx	annual	2.315	
MATHNDHI[d] – aggregate handling by frontend loader	PM_{10}	24-hour	0.1529	0.3058
		annual	0.06703	
CONVEY – conveyors, scalping screen	PM_{10}	24-hour	0.08780	0.1756
		annual	0.03849	

a. During December 1 through March 31 throughput and resulting emissions levels will be half that listed.

b. Assumes 8 hr/day of actual operation and 2000 hr/year operation.

c. Assumes 24 hr/day operation and 6000 hr/year operation.

d. Emissions are varied in the model according to wind speed category. Emissions listed are based on a 10 mph wind speed.

Fugitive particulate emissions from frontend loader handling of aggregate materials for the HMA plant were designated as emissions point MATHNDHI in the model. Two transfers were included for the source: 1) transfer of aggregate from truck unloading to a storage pile; 2) transfer of aggregate from the storage pile to a hopper. Emissions rates are a function of wind speed and were varied in the model according to wind speed. Attachment 1 provides details on emissions calculations.

Emissions from screening of aggregate and three conveyor transfers were combined into one source (emissions point CONVEY in the model). DEQ used emissions factors for controlled screening and conveyor transfers. Controlled emissions, based on use of water sprays, were used for screening and conveyor transfers because compliance with the 24-hour PM_{10} standard could not be demonstrated with a reasonable setback distance when using uncontrolled screening and conveyor transfer emissions.

DEQ's air impact analyses assumed that daily operations and resulting emissions during the period of December 1 through March 31 were at half those otherwise listed at the top of Table 6. The reductions in emissions were only applied to sources where emissions are a direct function of throughput. Reductions were not applied to generators and the asphalt oil tank heater.

Operations of the 2.82 MMBtu/hour asphalt oil tank heater were assumed to be 8.0 hour/day and 2,000 hour/year. This accounts for the intermittent nature of the heater – only operating a maximum of about 33 percent of the time while keeping asphalt oil at desired temperature.

Short-term CO emissions are estimated to be about 55 pounds/hour. This is less than the DEQ discretionary modeling threshold of 70 pounds/hour. The discretionary threshold was designed to assure impacts remain below SILs for applicable sources, which is well below the CO NAAQS. DEQ is confident that impacts from a 350 ton/hour HMA plant would be well below the CO NAAQS, since maximum emissions are less than the 70 pounds/hour threshold and these emissions represent facility-wide emissions rather than project emissions that are only a fraction of facility-wide emissions. Specific modeling for CO was not performed to provide additional compliance assurance.

3.2.2 TAP Emissions Rates

Table 7 lists TAP emissions rates for those TAPs exceeding ELs for an HMA plant producing 400,000 ton HMA/year.

Allowable impacts of carcinogenic TAPs may be 10 times the AACC if DEQ determines the facility uses T-RACT to control emissions. When T-RACT is used, DEQ has determined that compliance with a concentration of 10 times the AACCs is assured if emissions remain below 10 times the ELs. This approach is valid because conservative modeling was used to generate the emissions screening levels (ELs) of Idaho Air Rules Section 586, assuring that impacts are less than AACCs when emissions are less than ELs. Consequently, if emissions are below 10 times the ELs it is assured that impacts are below 10 times AACCs.

These air impact analyses assumed T-RACT was implemented for sources of TAPs at the HMA plant.

Table 7. TAP EMISSIONS USED IN DEQ ANALYSES			
Emissions Point in Model	**Pollutant**	**Averaging Period**	**Emissions Rate (lb/hr)**
DRYER – drum dryer/mixer - emissions controlled by a baghouse	Acetaldehyde	period	5.94E-2
	Arsenic	period	2.56E-5
	Benzene	period	1.78E-2
	Cadmium	period	1.87E-5
	Chromium 6+	period	2.05E-5
	Dioxins/furans	period	1.40E-10
	Formaldehyde	period	1.42E-1
	Nickel	period	2.88E-3
	PAH (naphthalene)	period	2.97E-2
	POM	period	2.50E-5
	Quinone	24-hour	1.67E-2
SILO – asphalt storage silo	Benzene	period	1.78E-4
	Formaldehyde	period	3.84E-3
	PAH(naphthalene)	period	2.11E-4
	POM	period	3.08E-5
LOAD – asphalt loadout	Benzene	period	9.88E-5
	Formaldehyde	period	1.67E-4
	PAH(naphthalene)	period	1.94E-4
	POM	period	2.10E-5
HOTOIL[a] – asphalt oil heater	Arsenic	period	6.20E-6
	Benzene	period	1.33E-6
	Cadmium	period	1.87E-6
	Chromium 6+	period	1.17E-6
	Dioxins/furans	period	1.47E-12
	Formaldehyde	period	4.73E-5
	Nickel	period	3.97E-4
	PAH (naphthalene)	period	7.99E-5
	POM	period	4.76E-7
GEN1[b] – electrical generator	Acetaldehyde	period	1.33E-4
	Benzene	period	4.09E-3
	Formaldehyde	period	4.16E-4
	PAH (naphthalene)	period	6.86E-4
	POM	period	2.37E-5
GEN2[b] – electrical generator	Acetaldehyde	period	5.52E-4
	Benzene	period	6.71E-4
	Formaldehyde	period	8.49E-4
	PAH (naphthalene)	period	6.10E-5
	POM	period	2.47E-6

	TAP	**Averaging Period**	**Emissions**	**EL**	**Modeling Required (10 x EL)[c]**
TOTALs	Acetaldehyde	period	6.01E-2	3.0E-3	Yes
	Arsenic	period	3.18E-5	1.5E-6	Yes
	Benzene	period	2.28E-2	8.0E-4	Yes
	Cadmium	period	2.06E-5	3.7E-6	No
	Chromium 6+	period	2.17E-5	5.6E-7	Yes
	Dioxins/furans	period	1.41E-10	1.5E-10	No
	Formaldehyde	period	1.47E-1	5.1E-4	Yes
	Nickel	period	3.28E-3	2.7E-5	Yes
	PAH(naphthalene)	period	3.09E-2	9.1E-5	Yes
	POM	period	1.03E-4	2.0E-6	Yes
	Quinone	24-hour	1.67E-2	2.7E-2	No

a. Assumes 2000 hr/year of actual operation.

b. Assumes 4,380 hr/year of actual operation.

c. A value of 10 x EL is only applicable for carcinogenic compounds of Idaho Air Rules Section 586 when T-RACT is implemented for control. For non-carcinogenic compounds of Idaho Air Rules Section 585, modeling is based on emissions exceeding the EL. Quinone is the only non-carcinogenic TAP emitted at levels exceeding the EL.

3.3 Emission Release Parameters and Plant Criteria

Table 8 lists the characteristics of the LeGrand/Johnson HMA plant used in DEQ's non-site-specific air impact analyses. Different scenarios were used to generate different setback distances depending upon throughput rates.

Table 8. CHARACTERISTIC OF HMA PLANT USED IN DEQ GENERIC ANALYSES	
Parameter	**Value or Description**
Throughput Rates	Scenario 1: < 350 ton/hr, 2,500 ton/day[a], 400,000 ton/yr Scenario 2: < 3,500 ton/day[a]
Co-Contributing Sources	The emissions points of the HMA plant are not located within 1,000 feet of other permittable emissions sources. A rock crushing plant could be operated at the site provided it is not operated during any day when the HMA plant is operated and annual throughput is less than 500,000 ton/yr. Alternatively, a rock crusher could be operated simultaneously (both operating in a given day) with the HMA plant provided the HMA throughput for that day does not exceed a value of half that otherwise allowed.
Dryer	Drum dryer fueled by natural gas, diesel, or used oil, with a baghouse for emissions control.
Dryer Stack Parameters	Stack height ≥6.8 m, stack diameter ≈1.2 m, gas temp ≥ 422 K, flow velocity ≥25 m/sec.
Asphalt Silo Filling	Model as a point source. Stack height = 9 m, stack diameter = 3.0 m, gas temp = 346 K (163° F), flow velocity = 0.1 m/sec. These parameters were developed by the DEQ modeling group to represent the nature of released emissions from this source in most all applications.
Asphalt Loadout	Model as a point source. Stack height = 5 m, stack diameter = 3.0 m, gas temp = 346 K (163° F), flow velocity = 0.1 m/sec. These parameters were developed by the DEQ modeling group to represent the nature of released emissions from this source in most all applications.
Tank Heater	<2.82 MMBtu/hr heat input, using low sulfur (<0.05%) distillate. ≤8 hr/day and 2000 hr/yr operation.
Heater Stack Parameters	Stack height ≥3.6 m, stack diameter ≈0.25 m, gas temp ≥589 K, flow velocity ≥6.0 m/sec.
Electrical Power	Line power or diesel-fired generators with the following characteristics: 1) a large generator powered by a diesel engine less than 1100 bhp, burning 0.05% S fuel; 2) a small generator powered by a diesel engine of less than 150 bhp, burning 0.05% S fuel. Other generators or combination of generators can be used provided the cumulative bhp rating of the engines do not exceed 150 bhp for the smaller engine and 1100 bhp for the larger engine. Hours of operation will be ≤12 hr/day and ≤4380 hr/yr.
Generator Stack Parameters	1100 bhp engine: stack height ≥4 m, stack diameter ≈0.2 m, gas temp ≥500 K, flow velocity ≥57 m/sec. 150 bhp engine: stack height ≥4 m, stack diameter ≈0.08 m, gas temp ≥500 K, flow velocity ≥41 m/sec.
Conveyor Transfers	≤3 transfers for any given quantity of material processed. Emissions controlled to a point equivalent to use of a water spray.
Scalping Screen	≤1 screen for any given quantity of material processed. Emissions controlled to a point equivalent to use of a water spray.
Frontend Loader Transfers	≤2 transfers for any given quantity of material processed. Typically involves: 1) aggregate to storage pile; 2) aggregate from pile to hopper.
Seasonal Restriction	Throughput is restricted to half allowable rates during the period between December 1 and March 31.

[a] Half the listed value for December 1 through March 31.

Table 9 provides emissions release parameters for the analyses including stack height, stack diameter, exhaust temperature, and exhaust velocity. Additional details are provided in Attachment 1.

Asphalt silo filling and asphalt loadout were modeled as point sources, rather than volume sources, to account for thermal buoyancy of the emissions plume. Release parameters for silo filling and asphalt loadout were based on the following:

- Release point of silo filling was established as the top of the storage silo and the release point of asphalt loadout operations was set to correspond to the top of a truck bed.
- Stack diameter of 3.0 meters was used to approximately correspond to a typical silo. Model-calculated stack tip downwash will account for downwash affects potentially caused by the silo.
- Stack gas temperature of 346K was calculated by assuming the gas temperature would be half that of the default asphalt temperature of 325°F (1/2 of 325° F = 163° F = 346 K).
- Flow velocity of 0.1 m/sec was used to establish a reasonably conservative total flow from the source of 1,500 actual cubic feet per minute, caused by convection.

DEQ modeling staff will make the determination of whether any release parameters slightly outside of those listed in Table 8 and 9 are still adequate for using DEQ's non-site-specific air impact analyses for the application in question. In general, if exit velocity and temperature are less than 75 percent of those used for the modeling analyses, compliance has not been adequately demonstrated by the analyses.

Table 9. EMISSIONS RELEASE PARAMETERS

Release Point /Location	Source Type	Stack Height (m)[a]	Modeled Diameter (m)	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
DRYER	Point	6.8	1.2	422	25
LOADOUT	Point	5.0	3.0	346	0.1
SILO	Point	9.0	3.0	346	0.1
HOTOIL	Point	3.6	0.25	589	6.0
GEN1	Point	4.1	0.20	500	57
GEN2	Point	4.1	0.076	500	41
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (m)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
MATHNDHI	Volume	2.5	4.65	1.16	
CONVY	Volume	5.0	4.65	1.16	

[a] Meters
[b] Kelvin
[c] Meters per second

3.4 Results for Cumulative NAAQS Impact Analyses and TAPs Analyses

DEQ determined required setback distances from the non-site-specific modeling results for each HMA production level scenario, criteria pollutant and TAP, and averaging period. Table 10 lists setback distances for each production level scenario and averaging period. Setback distances are the closest distance between the property boundary and the emissions release point of any emissions source (HMA plant stack, asphalt loadout point, aggregate hoppers, generator stacks, scalping screen, or conveyor transfer points).

Table 10. SETBACK DISTANCES AS A FUNCTION OF THROUGHPUT AND OPERATIONAL CONFIGURATION					
HMA Configuration Scenario	**Setback (m)**	**Controlling Pollutant**	**HMA Configuration Scenario**	**Setback (m)**	**Controlling Pollutant**
Setbacks for 2,500 ton HMA per day and 400,000 ton HMA per year					
Scenario 1[a]: mod fugitive dust control, baghouse on dryer, diesel generator	69	24-hr PM_{10}	Scenario 2[b]: mod fugitive dust control, baghouse on dryer, no generator	54	24-hr PM_{10}
Setbacks for 5,000 ton HMA per day or 2,500 ton per day when operating with a co-contributing rock crushing plant					
Scenario 1[a]: mod fugitive dust control, baghouse on dryer, diesel generator	103	24-hr PM_{10}	Scenario 2[b]: mod fugitive dust control, baghouse on dryer, no generator	97	24-hr PM_{10}
a. Scenario 1: moderate control of fugitives from material handling; 2.82 MMBtu/hr diesel boiler; 1,100 bhp and 150 bhp engine for generator; control on conveyors and screen equal to water spray. b. Scenario 2: moderate control of fugitives from material handling; 2.82 MMBtu/hr diesel boiler; no generators; control on conveyors and screen equal to water spray.					

3.5 Locating with Other Facilities/Equipment

The air impact analyses performed by DEQ assume there are no other emissions sources in the immediate area that measurably contribute to pollutant concentrations in a way not adequately accounted for by the background concentrations used. Such emissions sources could include a rock crushing plant, another HMA plant, a ready-mix concrete plant, or other permitted facility. DEQ modeling staff established a rule-of-thumb distance of 1,000 feet from emissions sources at the HMA plant where emissions from a nearby facility would need to be considered in the air impact analyses for the HMA plant. Emissions sources located beyond 1,000 feet are considered as too distant to have a measureable impact on receptors substantially impacted by the HMA plant.

HMA plants commonly co-locate with rock crushing plants. Impacts of 24-hour PM_{10} are the governing criteria for setback distances at the LeGrand Johnson HMA plant (governing for criteria pollutants – contributions of TAPs from other facilities are not considered in permitting analyses for the HMA plant). DEQ modeling staff determined NAAQS compliance is still assured when a rock crushing plant co-locates with the HMA plant, provided the HMA plant does not operate during any day when the rock crushing plant is operating and the annual actual throughput of the rock crushing plant is not greater than 500,000 tons. DEQ modeling staff also determined NAAQS compliance is assured when operating the HMA plant during the same day as the rock crushing plant, provided the throughput of the HMA plant is half that assumed for the modeling analyses used to generate setback distances.

4.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard.

ATTACHMENT 1

EMISSIONS CALCULATIONS AND MODELING PARAMETERS FOR DEQ'S AIR IMPACT ANALYSES

HMA Plant Modeled Emissions Rates

Setback requirements are linked to throughput levels and the equipment configuration.

Drum Dryer Emissions

The DEQ HMA plant emissions calculation spreadsheet was used to generate emissions quantities for applicable averaging periods. Emissions calculations assume worst-case fuels of either used oil, diesel, natural gas, or LPG. Emissions also assume control by a baghouse.

Asphalt Loadout

The DEQ HMA plant emissions calculation spreadsheet was used to generate emissions quantities for applicable averaging periods.

Asphalt Silo Filling

The DEQ HMA plant emissions calculation spreadsheet was used to generate emissions quantities for applicable averaging periods.

Asphalt Tank Heater Emissions

The DEQ HMA plant emissions calculation spreadsheet was used to generate emissions quantities for applicable averaging periods.

Power Generators

Operations involve use of two generators: 1) a large daytime generator powered by a diesel engine of 1,100 bhp rating or less; 2) a small nighttime generator powered by a diesel engine of 150 bhp rating or less. Emissions estimates were calculated assuming no EPA certification for the engines and combustion of 0.05% sulfur diesel. Generator operations of 12 hours per day and 4,380 hours per year were used to calculate emissions for respective averaging periods.

Aggregate Handling Emissions

Emissions from aggregate handling by frontend loaders were calculated for the following transfers: 1) aggregate to a storage pile; 2) aggregate from a pile to a hopper.

PM_{10} emissions associated with the handling of aggregate materials were calculated using emissions factors from AP42 Section 13.2.4.

Emissions were calculated using the following emissions equation:

$$E = k(0.0032)\left[\frac{(U/5)^{1.3}}{(M/2)^{1.4}}\right] \quad \text{lb/ton}$$

Where:

k	=	0.35 for PM_{10}
M	=	5% for aggregate
U	=	wind speed (mph)

A moisture content of 3% to 7% was estimated as a typical moisture content of aggregate entering the dryer, per STAPPA-ALAPCO-EPA, Emission Inventory Improvement Program, Volume II, Chapter 3, Preferred and Alternative Methods for Estimating Air Emissions from Hot Mix Asphalt Plants, Final Report, July 1996.

In the model, emissions are varied as a function of windspeed, with the base emissions entered for a windspeed of 10 mph.

upper windspeeds for 6 categories: 1.54, 3.09, 5.14, 8.23, 10.8 m/sec

Median windspeed for each category (1 m/sec = 2.237 mph)

Cat 1: (0 + 1.54)/2 = 0.77 m/sec ➢ 1.72 mph
Cat 2: (1.54 + 3.09)/2 = 2.32 m/sec ➢ 5.18 mph
Cat 3: (3.09 + 5.14)/2 = 4.12 m/sec ➢ 9.20 mph
Cat 4: (5.14 + 8.23)/2 = 6.69 m/sec ➢ 14.95 mph
Cat 5: (8.23 + 10.8)/2 = 9.52 m/sec ➢ 21.28 mph
Cat 6: (10.8 + 14)/2 = 12.4 m/sec ➢ 27.74 mph

Base factor – use 10 mph wind: $0.35\,(0.0032)\dfrac{(10/5)^{1.3}}{(5/2)^{1.4}} = 7.646\text{ E}-4$ lb/ton

Adjustment factors to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (3.105 E-4) = 7.756 E-5 lb/ton
Factor = 7.756 E-5/7.646 E-4 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (3.105 E-4) = 3.251 E-4 lb/ton
Factor = 3.251 E-4/ 7.646 E-4 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (3.105 E-4) = 6.861 E-4 lb/ton
Factor = 6.861 E-4/7.646 E-4 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (3.105 E-4) = 1.290 E-3 lb/ton
Factor = 1.290 E-3/7.646 E-4 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (3.105 E-4) = 2.041 E-3 lb/ton
Factor = 2.041 E-3/7.646 E-4 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (3.105 E-4) = 2.881 E-3 lb/ton
Factor = 2.881 E-3/7.646 E-4 = 3.768

For the operational scenario for 2,500 ton/day HMA and 400,000 ton/year HMA, emissions are as follows:

Daily PM_{10}:

7.646 E-4 lb PM_{10}	2400 ton	day	2 transfers	=	0.1529 lb
ton	day	24 hr			hr

Annual PM_{10}:

7.646 E-4 lb PM_{10}	384,000 ton	yr	2 transfers	=	0.06703 lb
ton	yr	8,760 hour			hr

Daily and annual throughputs were based on aggregate being 96% of the total HMA production.

These sources were modeled as a single volume source with a 20-meter square area, 5.0 meters thick, with a release height of 2.5 meters. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 20 m / 4.3 = 4.65 m

σ_{zo} = 5 m / 4.3 = 1.16 m

Conveyors and Screens Emissions

These sources include the scalping screen and conveyor transfers. Controlled emissions factors for the conveyor transfers and the scalping screen were used, assuming the control measures used would be equivalent to the application of water sprays.

Daily and annual throughputs were based on aggregate being 96% of the total HMA production.

For the operational scenario for 2,500 ton/day HMA and 400,000 ton/year HMA, emissions are as follows:

Scalping Screen (controlled emissions):

Daily PM_{10}:

$$\frac{0.00074 \text{ lb } PM_{10}}{\text{ton}} \cdot \frac{2400 \text{ ton}}{\text{day}} \cdot \frac{\text{day}}{24 \text{ hour}} = \frac{0.07400 \text{ lb}}{\text{hr}}$$

Annual PM_{10}:

$$\frac{0.00074 \text{ lb } PM_{10}}{\text{ton}} \cdot \frac{384{,}000 \text{ ton}}{\text{yr}} \cdot \frac{\text{yr}}{8{,}760 \text{ hour}} = \frac{0.03244 \text{ lb}}{\text{hr}}$$

Conveyor Transfers (controlled emissions):

Daily PM_{10}:

$$\frac{4.60 \text{ E-5 lb } PM_{10}}{\text{ton}} \cdot \frac{2400 \text{ ton}}{\text{day}} \cdot \frac{\text{day}}{24 \text{ hour}} \cdot 3 \text{ transfers} = \frac{0.01380 \text{ lb}}{\text{hr}}$$

Annual PM_{10}:

$$\frac{4.60 \text{ E-5 lb } PM_{10}}{\text{ton}} \cdot \frac{384{,}000 \text{ ton}}{\text{yr}} \cdot \frac{\text{yr}}{8{,}760 \text{ hour}} \cdot 3 \text{ transfers} = \frac{0.006049 \text{ lb}}{\text{hr}}$$

Total Daily Emissions (unloading, screening, conveyors) = 0.08780 lb/hr

Total Annual Emissions (unloading, screening, conveyors) = 0.03849 lb/hr

These sources were modeled as a single volume source with a 20-meter square area, 5.0 meters thick, with a release height of 5.0 meters. The initial dispersion coefficients are calculated as follows:

σ_{yo} = 20 m / 4.3 = 4.65 m

σ_{zo} = 5 m / 4.3 = 1.16 m

HMA Plant Modeling Parameters

Dryer Baghouse Stack

Release height = 6.8 meters; effective diameter of release area = 1.2 meters; typical stack gas temperature = 422K; typical flow velocity = 25 meters/second

Asphalt Silo Filling

DEQ modeled this source as a point source.
- release height of 9 meters (equal to height of silo)
- stack diameter of 3 meters, corresponding to the approximate diameter of the silo
- gas temperature was estimated at half the AP42 default asphalt temperature: 325^{o} F / 2 = 163^{o} F
- stack velocity of 0.1 m/sec to account for convective air flow.

Asphalt Loadout

DEQ modeled this source as a point source.
- release height of 5 meters (equal to height of silo)
- stack diameter of 3 meters, corresponding to the approximate diameter of the silo
- gas temperature was estimated at half the AP42 default asphalt temperature: 325^{o} F / 2 = 163^{o} F
- stack velocity of 0.1 m/sec to account for convective air flow.

Aggregate to and from Storage

Release emissions in model from a 20 m X 20 m area 5 m high, released at 2.5 m

Initial dispersion coefficients:

σ_{y0} = 20 m / 4.3 = 4.65 m

σ_{z0} = 5 m / 4.3 = 1.16 m

Sources include: two transfers, equivalent in emissions to that of a frontend loader, from the point of aggregate delivery to transfer to the HMA plant hopper.

Conveyor Transfers and Scalping Screen

Release emissions in model from a 20 m X 20 m area 5 m high, released at 5 m

Initial dispersion coefficients:

σ_{y0} = 20 m / 4.3 = 4.65 m

σ_{z0} = 5 m / 4.3 = 1.16 m

Sources include: all conveyor transfers associated with HMA operations

Asphalt Oil Heater

Stack parameters are dependent upon the fuel combusted. A combustion evaluation was used to estimate actual stack flow, assuming respective fuel requirements for a 2.82 MMBtu/hr boiler and a stack gas release temperature of 589 K.

Parameters for the diesel-fired boiler are as follows:

> Stack height = 3.6 m; stack diameter = 0.25 meters; stack gas temperature = 589 K; flow velocity = 6.0 meters/second

Power Generator

Stack gas temperatures and flow rates are often overestimated by permit applicants, likely because values reported by manufacturers are based on values measured at the exhaust manifold rather than at the point of release to the atmosphere.

The parameters used in modeling for the large diesel generator were derived by the following process:

1. The flow for a 1,000 kW generator found online was 6,907 cfm at 959° F (515° C)(788 K)
2. A reasonably conservative (on the low side) release temperature of 500 K was selected and the acfm flow of 4,383 was calculated for the new temperature.
3. using a flow of 4,000 acfm and the stated diameter of 0.20 m, a flow velocity of 57 m/sec was calculated.

The final point source parameters were as follows:

> Stack height = 4.1 m; stack diameter = 0.20 meters; stack gas temperature = 500 K; flow velocity = 57 meters/second.

The parameters used in modeling for the smaller diesel generator were derived by the following process:

1. The flow for a 100 kW generator found online was 805 cfm at 1076° F (580° C)(853 K)
2. A reasonably conservative (on the low side) release temperature of 500 K was selected and the acfm flow of 472 was calculated for the new temperature.
3. Using a flow of 400 acfm and the stated diameter of 0.076 m, a flow velocity of 41 m/sec was calculated.

The final point source parameters were as follows:

> Stack height = 4.1 m; stack diameter = 0.076 meters; stack gas temperature = 500 K; flow velocity = 41 meters/second.

APPENDIX C – PROCESSING FEE

PTC Fee Calculation

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company:	**LeGrand Johnson Construction Co.**
Address:	**P. O. Box 248**
City:	**Logan**
State:	**Utah**
Zip Code:	**84323**
Facility Contact:	**Lori Wadsworth**
Title:	**Estimator**
AIRS No.:	**777-00054**

N Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

Y Did this permit require engineering analysis? Y/N

N Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	52.6	0	52.6
SO_2	3.6	0	3.6
CO	51.6	0	51.6
PM10	6.6	0	6.6
VOC	10.4	0	10.4
TAPS/HAPS	7.3	0	7.3
Total:	**132.1**	0	**132.1**
Fee Due	$ 7,500.00		

Comments: