Statement of Basis

Permit to Construct No. P-2015.0024
Project ID 61529

POE Asphalt Paving 00084
Lewiston, Idaho

Facility ID 777-00084

Final

March 8, 2016
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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.

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ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
bhp	break horsepower
BMP	best management practices
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CAS No.	Chemical Abstracts Service registry number
CBP	concrete batch plant
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CMS	continuous monitoring systems
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FEC	Facility Emissions Cap
GHG	greenhouse gases
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HHV	higher heating value
HMA	hot mix asphalt
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
iwg	inches of water gauge
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
LPG	liquefied petroleum gas
m	meters
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide

NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
O_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PCB	polychlorinated biphenyl
PERF	Portable Equipment Relocation Form
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
RAP	recycled asphalt pavement
RFO	reprocessed fuel oil
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SOB	statement of basis
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
TEQ	toxicity equivalent
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

The Poe Cedarapids #1900 portable hot mix asphalt (HMA) facility consists of a drum mix asphalt plant that includes a counterflow drum dryer with a 5 MMBtu/hr duct burner, an aboveground asphalt oil storage tank with a tank heater, a baghouse, storage silos, conveyors and feed bins, aggregate stock piles, and haul trucks. A 1,190 bhp generator supplies power to the facility when line power is not available.

Drum mix asphalt plants may be of either parallel flow design or the counterflow design. In either design, aggregate (gravel) is dried in the drum and mixed with liquid asphalt cement to produce hot-mix asphalt which is used primarily for road and parking lot construction. The production of hot-mix asphalt includes aggregate handling operations which may include front end loaders, storage bins, conveyance systems, stock piles and haul trucks.

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).

April 28, 2006	P-050215, Permit modification to burn used oil, Permit status (A, but will become S upon issuance of this permit)
March 26, 1993	777-00084, initial PTC, Permit status (S)

Application Scope

This PTC is a revision of an existing PTC.

The applicant has proposed to:

- replace the existing drum dryer
- replace the existing recycled asphalt pavement (RAP) system
- replace the existing baghouse
- add a 5 MMBtu/hr duct burner between the new drum dryer and the new baghouse.

Application Chronology

June 2, 2015	DEQ received an application and an application fee.
September 4, 2015	DEQ determined that the application was complete.
September 9, 2015	DEQ received supplemental information from the applicant.
October 29, 2015	DEQ made available the draft permit and statement of basis for peer and regional office review.
November 2, 2015	DEQ made available the draft permit and statement of basis for applicant review.
November 16, 2015	DEQ received the permit processing fee.
January 8, 9, and February 17, 2016	DEQ received supplemental information from the applicant.
February 16, 2016	DEQ made available the second draft permit and statement of basis for applicant review.
March 8, 2016	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Sources	Control Equipment	Emission Point ID No.
Hot-mix Asphalt Drum Dryer Manufacturer: Maxam Equipment, Inc. (drum) on a CMI frame/chasis Model: 8'x45' (SN #14110707-02) for the drum but a CMI tag with model TDT400; SN#212 of old drum is still there. Type: portable. counterflow drum mix Manufacture date: 2014 Drum dryer burner manufacturer: HOUCK Drum dryer heat input capacity: 97 MMBtu/hr Max. asphalt production: 425 T/hr, 10,200 T/day, 309,091 T/yr Max. RAP: up to 50% Fuel: natural gas, liquefied petroleum gas(LPG), propane, ASTM Grade 2 fuel oil, used oil at 0.75% sulfur, or Grade 4 reprocessed fuel oil (RF04) at 0.75% sulfur Duct burner between drum dryer and the baghouse Rated heater input capacity: 5 MMBtu/hr Fuel: natural gas, propane, LPG, or ASTM Grade 2 fuel oil	Baghouse: Manufacturer: Maxam equipment, Inc. Model: Maxam portable baghouse size 36 Type: pulse jet Number of filter elements: 504 Air to cloth ratio: 3.18 to 1 Operating pressure drop: 3 to 6 inch-H_2O PM_{10} control efficiency: 0.010 gr/dscf based on 80% particulate above 5 µm	Exit height: 30 ft Exit diameter: 42 inch Exit flow rate: 79,000 acfm Exit temperature: 225 °F
Asphalt Tank Heater Manufacturer: ASTEC/CEI Model: CEI-1800 Type: circulating hot oil heater with power flame burner (indirect heat) Fuel types: natural gas, propane, LPG, or ASTM Grade 2 fuel oil Rated heat input capacity: 2.115 MMBtu/hr	None	NA
Primary IC Engine: Manufacturer: Caterpillar Model: 3412 Manufacture date: 2003 Maximum power rating: 1,190 bhp (rated at 800 kW or 1,190 hp/725 kW) Fuel: ultra-low-sulfur diesel (ULSD) for non-road engine	None	NA

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an

air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Uncontrolled Potential to Emit

Using the definition of Potential to Emit, uncontrolled Potential to Emit is then defined as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall **not** be treated as part of its design **since** the limitation or the effect it would have on emissions **is not** state or federally enforceable.

The uncontrolled Potential to Emit is used to determine if a facility is a "Synthetic Minor" source of emissions. Synthetic Minor sources are facilities that have an uncontrolled Potential to Emit for regulated air pollutants or HAP above the applicable Major Source threshold without permit limits.

The following table represents uncontrolled PTE that is taken from the statement of basis (SOB) for PTC No. P-050215 issued on April 28, 2006.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS AND HAP

	POTENTIAL TO EMIT WITHOUT LIMITS[a]			
Pollutant	**Drum Dryer**	**Asphalt Tank Heater**	**Generator**	**Total Emissions**
	(T/yr)	**(T/yr)**	**(T/yr)**	**(T/yr)**
PM (total)	67,452	0.135	3.29	67,455
PM_{10} (total)	15,659	0.135	1.63	15,660
CO	313.2	0.763	28.0	342
NO_x	132.5	1.35	105	239
SO_2	209.6	4.80	16.6	231
VOC	77.1	0.050	2.96	80.1
Lead	3.61E-02	1.02E-04	0.0	0.0362
Any HAP	7.47[b]	---	---	7.47[b]
Total HAPs	---	---	---	26.0

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria pollutants and HAP from the HMA plant as calculated using DEQ's HMA EI spreadsheet.

Table 3 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS AND HAP

Pollutant	A **Drum Mix** Max Emission Rate for Pollutant (T/yr)	B **Asphalt Tank Heater** Max Emission Rate for Pollutant (T/yr)	C **IC Engine IC1 + IC2** Max Emission Rate for Pollutant (T/yr)	D **Load-out & Silo Filling,** Emission Rate for Pollutant (T/yr)	E **POINT SOURCE TOTAL** of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	6.60	0.10	0.43	0.22	7.13
PM-10 (total)	4.60	0.07	0.52	0.22	5.19
PM-2.5	4.46	0.05	0.20	0.22	4.71

Pollutant	A **Drum Mix** Max Emission Rate for Pollutant (T/yr)	B **Asphalt Tank Heater** Max Emission Rate for Pollutant (T/yr)	C **IC Engine IC1 + IC2** Max Emission Rate for Pollutant (T/yr)	D **Load-out & Silo Filling,** Emission Rate for Pollutant (T/yr)	E **POINT SOURCE TOTAL** of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
CO	26.00	0.35	2.97	0.51	29.32
NOx	11.00	0.74	11.54		23.28
SO_2	17.80	2.19	0.00		20.00
VOC	6.40	0.02	0.42	0.81	6.85
Lead	3.00E-03	4.66E-05	0.00E+00		3.05E-03
HAP					2.18

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for criteria and HAP from the HMA plant as determined using DEQ's HMA emissions inventory (EI) Spreadsheet. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 4 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS AND HAP

Pollutant	A **Drum Mix** Max Emission Rate for Pollutant (T/yr)	B **Asphalt Tank Heater and Duck Burner** Max Emission Rate for Pollutant (T/yr)	C **IC Engine IC1 + IC2** Max Emission Rate for Pollutant (T/yr)	D **Load-out & Silo Filling,** Emission Rate for Pollutant (T/yr)	E **POINT SOURCE TOTAL** of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	5.10	0.15	0.43	0.17	5.63
PM-10 (total)	3.55	0.10	0.52	0.17	4.15
PM-2.5	3.45	0.07	0.20	0.17	3.69
CO	20.09	0.50	2.97	0.39	23.41
NOx	8.50	1.06	11.55		20.79
SO_2	20.63	3.13	4.59E-03		22.83
VOC	4.95	0.03	0.42	0.62	5.39
Lead	2.32E-03	6.66E-05	0.00E+00		2.36E-03
HAP					1.70

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 5 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Pollutant	**A Drum Mix** Max Emission Rate Change for Pollutant (T/yr)	**B Asphalt Tank Heater and Duct Burner** Max Emission Rate Change for Pollutant (T/yr)	**C IC Engine IC1 + IC2** Max Emission Rate Change for Pollutant (T/yr)	**D Load-out & Silo Filling,** Emission Rate Change for Pollutant (T/yr)	**E POINT SOURCE TOTAL** of Max Emission Rates Change from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	-1.50	0.04	0.00	-0.05	-1.50
PM-10 (total)	-1.05	0.03	0.00	-0.05	-1.05
PM-2.5	-1.01	0.02	0.00	-0.05	-1.01
CO	-5.91	0.15	0.00	-0.11	-5.91
NOx	-2.50	0.32	0.00		-2.50
SO_2	-6.07	0.94	-1.65		-7.72
VOC	-1.45	0.01	0.00	-0.18	-1.45
Lead	-6.82E-04	2.00E-05	0.00		-6.82E-04
HAP					-0.48

TAP Emissions

All TAP increments are below their respective screening emission levels (ELs). Refer to the EI spreadsheet in Appendix A for details.

Ambient Air Quality Impact Analyses

Modeling is not required because the emissions decrease as a result of this permitting action.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The modeling analysis previously performed for this facility demonstrates compliance with applicable standards in attainment areas. However, because a separate modeling analysis was not provided to demonstrate compliance with applicable standards in non-attainment areas, this portable facility is not permitted for operation in non-attainment areas. This requirement is assured by Section 4 of the permit.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For THAPs (Total Hazardous Air Pollutants) Only:

A = Use when any one HAP has actual or potential emissions $\geq$ 10 T/yr or if the aggregate of all HAPS (Total HAPs) has actual or potential emissions $\geq$ 25 T/yr.

SM80 = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the permit sets limits $\geq$ 8 T/yr of a single HAP or $\geq$ 20 T/yr of THAP.

SM = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only

if the source complies with federally enforceable limitations) and the potential HAP emissions are limited to < 8 T/yr of a single HAP and/or < 20 T/yr of THAP.

B = Use when the potential to emit without permit restrictions is below the 10 and 25 T/yr major source threshold

UNK = Class is unknown

For All Other Pollutants:

A = Actual or potential emissions of a pollutant are ≥ 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are < 80 T/yr.

B = Actual and potential emissions are < 100 T/yr without permit restrictions.

UNK = Class is unknown.

Table 6 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	> 100	< 80	**100**	SM
$PM_{10}/PM_{2.5}$	> 100	<80	**100**	SM
SO_2	> 100	<80	**100**	SM
NO_X	> 100	<80	**100**	SM
CO	> 100	<80	**100**	SM
VOC	< 100	<80	**100**	B
HAP (single)	< 10	< 1	**10**	SM
HAP (Total)	> 25	< 1	**25**	

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 proposed new emissions source and for the modified emissions sources. 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.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625..... Visible Emissions

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 3.2, 3.16, and 3.17.

Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701)

IDAPA 58.01.01.701 ..... Particulate Matter – New Equipment Process Weight Limitations

IDAPA 58.01.01.700 through 703 set PM emission limits for process equipment based on when the piece of equipment commenced operation and the piece of equipment's process weight (PW) in pounds per hour (lb/hr). IDAPA 58.01.01.701 and IDAPA 58.01.01.702 establish PM emission limits for equipment that commenced operation on or after October 1, 1979 and for equipment operating prior to October 1, 1979, respectively.

As presented previously in the Emissions Inventories Section, the post project PTE for each emissions unit is well below respective process weight limitation. Therefore, compliance with this requirement has been demonstrated.

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 each criteria pollutants or 10 tons per year for any one HAP or 25 tons per year for all HAP 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, 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/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)

This project does not alter the facility's applicability to 40 CFR 60, Subpart I - National Standards of Performance for Hot Mix Asphalt Plants.

According to Poe's 2/9/2016 email, the change to the facility does not qualify as "reconstructed" of the HMA facility as defined in 40 CFR 60.15 because the fixed capital cost of the new components was less than 50% of the cost that would be incurred to construct a comparable HMA facility ($1,285,700 < 50% of $3 million +).

40 CFR 60, Subpart I — **National Standards of Performance for Hot Mix Asphalt Plants**

§ 60.90 — Applicability and designation of affected facility

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

The affected facility includes: the dryer; 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.

Analysis: The Poe HMA plant commenced construction or modification after June 11, 1973, therefore, is subject to requirements of this subpart.

§ 60.91 — Definitions

This section contains the definitions of this subpart.

§ 60.92 — Standard for particulate matter

In accordance with §60.92, no owner or operator shall discharge or cause the discharge into the atmosphere from any affected facility any gases which contain particulate matter in excess of 0.04 gr/dscf or exhibit 20% opacity or greater. Permit Conditions 3.1 and 3.3 include the requirements of this section.

§ 60.93 — Test methods and procedures

In accordance with §60.93(a), performance tests shall use as reference methods and procedures the test methods in Appendix A of 40 CFR 60.

In accordance with §60.93(b), compliance with the particulate matter standards shall be determined by EPA Reference Method 5, and opacity shall be determined by EPA Reference Method 9.

Permit Condition 3.17 includes the requirements of this section.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

The HMA plant currently has three CI generator engines. They are Caterpillar 1,190 bhp engine, Pine Power 165 bhp engine, and Stamford New Age 72.4 bhp engine. According to the application, the subpart does not apply as the engines are portable and do not stay in one location for any continuous 12 months period. According to the applicant, the 165 bhp and 72.4 bhp engines were exempt from getting a PTC.

Permit Conditions Review

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

Permit Condition 1.1 describes the scope of this PTC revision.

Permit Condition 1.3 states that this PTC replaces Permit to Construct No. P-050215, issued on April 28, 2006.

Table 1.1 is revised to include the information for the new drum dryer, new baghouse, the new duct burner, and new fuel type. According to the application, Poe's engines are non-road engines, and therefore are required to use ultra-low-sulfur diesel (ULSD, 15 ppm) after 2014. The fuel type is changed from "ASTM grade 2 fuel oil" to "ultra-low-sulfur diesel" for the primary IC engine in the permit.

Permit Condition 2.1 is revised to add "A 5 MMBtu/hr duct burner is added between the drum dryer and the baghouse."

Permit Condition 3.4 and Table 3.1 are revised to reflect the new emissions limits for the new drum dryer with the new 5 MMBut/hr duct burner.

PM_{10} emissions from the drum dryer are taken from DEQ's HMA EI spreadsheet; they are 9.78 lb/hr and 3.55 T/yr.

PM_{10} emissions from the duct burner are taken from DEQ's HMA EI spreadsheet by inputting 5 MMBtu/hr as a rated heat input rate under Asphalt Tank Heater. Because the duct burner and the asphalt tank heater use the same emissions factor for PM_{10}, they have the same calculated emissions for the same rated heat input rate. The PM_{10} emissions from the duct burner are 0.084 lb/hr and 0.0305 T/yr.

The emissions limits in Table 3.1 are the sum of the emissions from the drum dryer and the duct burner.

The footnote of Table 3.1 is new and is taken from the current permitting guidance (2008AAF202).

Permit Condition 3.6 is revised to reflect the change to the fuel types of the asphalt tank heater and the generator engines.

Permit Condition 3.8 is revised to add the new duct burner.

Permit Condition 3.9 is revised to replace the daily and annual throughputs with the new values.

Permit conditions 3.10 and 3.12 are replaced with "reserved" as pressure drop across a baghouse is no longer a monitoring parameter for baghouse in accordance with the permitting guidance (2008AAF202).

Permit Condition 3.11 is replaced with the standard language for baghouse taken from the permitting guidance document (2008AAF202). In Permit Condition 3.11, the frequency for visible emissions inspections and baghouse inspection is kept the same as that in the existing permit. That is monthly.

Permit condition 3.14 bullet No. 1 regarding baghouse pressure drop is removed as pressure drop across a baghouse is no longer a monitoring parameter for baghouse in accordance with the permitting guidance document (2008AAF202). In PC 3.14, "two-year" is replaced with "five-year" to be consistent with General Provisions 6.10.

Permit Conditions 3.15, 3.16, 3.18, and 3.19 are revised. For recordkeeping, "two-year" is replaced with "five-year" to be consistent with General Provisions 6.10.

Permit Condition 3.17.1 is revised regarding parameters monitoring and recording. The following revised requirements are taken from the current HMA general permit.

- The asphalt production rate, in tons per hour, at least once every 15 minutes,
- The visible emissions observed,
- The RAP percentage usage,
- The fuel combusted in the asphalt drum mixer, and
- The applicable emissions control device operating parameters at least once every 15 minutes.

New Permit Condition 3.21 is the performance test reporting requirement that was unintentionally missed in the existing permit.

New Permit Conditions 3.22 and 3.23 are taken from the current HMA general permit as the facility is subject 40 CFR 60 Subpart I.

New Permit Section 5 has addressed the applicability of 40 CFR 63 Subpart ZZZZ, should the engines are no longer non-road engines.

General Provisions are replaced with the ones from the current PTC template.

PUBLIC REVIEW

Public Comment Opportunity

Because this permitting action does not authorize an increase in emissions, an opportunity for public comment period was not required or provided in accordance with IDAPA 58.01.01.209.04.

APPENDIX A – EMISSIONS INVENTORIES

A.1 EI Spreadsheet for Emissions without Duct Burner

A.2 EI Spreadsheet for Duct Burner Emissions Only

Total emissions are the sum of the emissions calculated in the above two EI spreadsheets.

Post PTE without duct burner

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (T/yr)	C IC Engine IC1 + IC2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling, Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	5.100002	0.101868	0.433109	0.17121	5.634979
PM-10 (tot	3.554547	0.070999	0.523982	0.17121	4.149528
PM-2.5	3.446365	0.047538	0.197818	0.17121	3.691721
CO	20.09092	0.348353	2.973728	0.39088	23.413
NOx	8.500003	0.74086	11.54529		20.78616
SO2	20.63182	2.19171	4.59E-03		22.83
VOC	4.945456	0.022809	0.423818	0.623016	5.392083
Lead	0.002318	4.66E-05	0		0.002365

Post PTC duct burner only

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Duck Burner Max Emission Rate for Pollutant (T/yr)
PM (total)	0	0.043786
PM-10 (tot	0	0.030518
PM-2.5	0	0.020433
CO	0	0.149733
NOx	0	0.318444
SO2	0	0.942063
VOC	0	0.009804
Lead	0	2E-05

Post Project PTE with Duct Buner

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater and duct burner Max Emission Rate for Pollutant (T/yr)	C IC Engine IC1 + IC2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling, Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	5.10	0.15	0.43	0.17	5.63
PM-10 (tot	3.55	0.10	0.52	0.17	4.15
PM-2.5	3.45	0.07	0.20	0.17	3.69
CO	20.09	0.50	2.97	0.39	23.41
NOx	8.50	1.06	11.55		20.79
SO2	20.63	3.13	4.59E-03		22.83
VOC	4.95	0.03	0.42	0.62	5.39
Lead	2.32E-03	6.66E-05	0.00E+00		2.36E-03

Pre-project PTE

Pollutant	A **Drum Mix** Max Emission Rate for Pollutant (T/yr)	B **Asphalt Tank Heater** Max Emission Rate for Pollutant (T/yr)	C **IC Engine IC1 + IC2** Max Emission Rate for Pollutant (T/yr)	D **Load-out & Silo Filling,** Emission Rate for Pollutant (T/yr)	E **POINT SOURCE TOTAL** of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	6.60	1.02E-01	4.33E-01	2.22E-01	7.13
PM-10 (tot	4.60	7.10E-02	5.24E-01	2.22E-01	5.19
PM-2.5	4.46	4.75E-02	1.98E-01	2.22E-01	4.71
CO	26.00	3.48E-01	2.97E+00	5.06E-01	29.32
NOx	11.00	7.41E-01	1.15E+01		23.29
SO2	26.70	2.19E+00	1.65E+00		30.54
VOC	6.40	2.28E-02	4.24E-01	8.06E-01	6.85
Lead	3.00E-03	4.66E-05	0.00E+00		3.05E-03

Post Project PTE

TOTAL Federal HAPs (T/yr)=	1.692232	no burner
TOTAL Federal HAPs (T/yr)=	0.010654	burner
	1.702887	total post-proj HAP PTE

Pre-project PTE

TOTAL Federal HAPs (T/yr)=	2.180776

Net change

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater and duct burner Max Emission Rate for Pollutant (T/yr)	C IC Engine IC1 + IC2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling, Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	-1.50	0.04	0.00	-0.05	-1.50
PM-10 (tot	-1.05	0.03	0.00	-0.05	-1.05
PM-2.5	-1.01	0.02	0.00	-0.05	-1.01
CO	-5.91	0.15	0.00	-0.11	-5.91
NOx	-2.50	0.32	0.00		-2.50
SO2	-6.07	0.94	-1.65		-7.72
VOC	-1.45	0.01	0.00	-0.18	-1.45
Lead	-6.82E-04	2.00E-05	0.00E+00		-6.82E-04

Net change

TOTAL Federal HAPs (T/yr)=	-4.78E-01

A.1 EI Spreadsheet for Total Emissions without Duct Burner

Hot Mix Asphalt EI Spreadsheet

Idaho Department of Environmental Quality, Air Quality Division, Boise, Idaho Version 2/11/15

Information shown in bold blue on any worksheet indicates user input for that cell. Black or blue 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 collocated with only one rock crushing plant and no other sources of emissions within 1,000 feet.

User Input:

Facility Data Input worksheet: Input facility-specific data including contact information, equipment ratings, proposed HMA production levels, and tank heater and generator hours of operation. Select fuel types and generator 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 as this 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.

Asphalt Drum Mixer/Dryer with Fabric Filter (Baghouse), either counterflow or parallel flow, fired by the following fuels:

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

Asphaltic Oil Tank Heater, either fired by #2 fuel oil or natural gas

Note: For Facility Data Input., input "1" (use this fuel) or "0" (don't use this fuel).
Note: If line power is **ALWAYS** used to power the Asphaltic oil tank heater, input "0" for each fuel.
For distallate fuel oil the default is 0.5% sulfur content by weight. User input is required in "Facility Data Input" for any other sulfur content.
Note: The EI summary sheets will use the highest emission for any selected fuel for each pollutant.

For IC Engines Powering Electrical Generators (with a maximum of one small, less than 600 bhp, and/or one large IC engine, greater than 600 bhp)

Facility Data Input: Input "1" (include IC engine) or "0" (omit IC engine).
For distallate fuel oil the default is 0.5% sulfur content by weight. User input is required in "Facility Data Input" for any other sulfur content.
Engine Certification: Input whether or not the IC engine is certified, or is certfied to meet EPA Tier 1, Tier 2, Tier 3, or Blue Sky standards.
The EI will use the appropriate EFs for either a large or small diesel-fueled generator. EI summary sheets combine contributions from just one small (< 600 bhp) and/or one large (> 600 bhp) generator.

General Assumptions (see the next tab sheet for specific assumptions for each tab sheet):

This emissions evaluation is based on IDAPA regulatory requirements current as of spreadsheet version date.
EFs are drawn from AP-42 factors available as of spreadsheet version date.
Average brake-specific fuel consumption of 7,000 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 a density of 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 user **input** of facility-specific parameters)
EmissionInventory lb/hr - Drum dryer baghouse, tank heater, generator, silo filling, and load-out
EmissionInventory TPY - Drum dryer baghouse, tank heater, generator, silo filling, and load-out
Values in Emission Inventories reflect the maximum emissions ONLY from fuel types selected.
FACWIDE TAPs ELs. Used for TAPs EL screening. Includes silo/loadout fugitives.
Lb/hr emissions shown are 24-hr averages for noncarcinogens and annual averages for carcinogens.
Modeling - Criteria Pollutants 1-, 3-, 8-, 24-hour, and annual lb/hr emission rates
Modeling - TAPs 24-hour and annual lb/hr emission rates

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
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 # transfer pts, wind speeds & moisture**
IC1 Emission Factors (Selects appropriate EFs for non-certified engines and EPA Tier 1, 2, 3, and Blue Sky engines)
IC ENGINE 1< 600 bhp (< 447kW) #2 Fuel oil fired
IC2 Emission Factors (Selects appropriate EFs for non-certified engines and EPA Tier 1, 2, 3, and Blue Sky engines)
IC ENGINE 2 > 600 bhp (> 447kW) #2 Fuel oil fired

DEQ ASSUMPTIONS

DEQ assumptions for the "Drum Dryer UsedOil FabricFilter" Calculations
1. Drum Dryer may be either counter-flow or parallel flow (AP-42 specifies no diference in emissions from either type).
2. SO2 emissions are based on the sulfur content and the Scavenging Factor (varies from 50 to 97%). DEQ used a scavenging factor of 63%. The sulfur content of the three waste oil source tests averaged 0.44 % by weight.

DEQ assumptions for the "Drum Dryer NG FabricFilter" Calculations

DEQ assumptions for the "Drum Dryer #2 Oil FabricFilter" Calculations
1. SO2 emissions are based on the sulfur content and the Scavenging Factor (varies from 50 to 97%). DEQ used a scavenging factor of 63%. The sulfur content of the three waste oil source tests averaged 0.44 % by weight.

DEQ assumptions for the "Drum Dryer LPGProp FabricFilter" Calculations

DEQ assumptions for the "TankHtr #2 Oil-AP42 1.3,11.1" Calculations
1. VOC and TAPs emissions from the asphaltic oil storage tank were determined using Tanks 4.0.9d and the Working and Breathing losses were negligible (less than 1% of total VOC emissions).

DEQ assumptions for the "Tank Heater NG-AP42 11.1" Calculations
1. VOC and TAPs emissions from the asphaltic oil storage tank were determined using Tanks 4.0.9d and the Working and Breathing losses were negligible (less than 1% of total VOC emissions).

DEQ assumptions for the "Tank Heater NG-AP42 1.4" Calculations
1. VOC and TAPs emissions from the asphaltic oil storage tank were determined using Tanks 4.0.9d and the Working and Breathing losses were negligible (less than 1% of total VOC emissions).

DEQ assumptions for the "SiloFill Criteria&TAPs" Calculations
1. All PM10 is assumed to be PM2.5.

CURRENT PTC APPLICATION VALUES

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

Facility ID/AIRS No.	XXX-XXXXX	Spreadsheet Date	2/16/2016 14:58
Permit No.	P-20XX.XXXX	DEQ Version Date	7/20/2011
Facility Owner/Company Name:	Facility Name		
Address:	Facility Address		
City, State, Zip:	City, State Zip		
Facility Contact:	Facility Contact		
Contact Number/ e-mail:	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	make/model	Distallate (#2) Fuel Oil	1
Rated heat input capacity, MMBtu/hr	97	Used Oil or RFO4 Oil	1
Drum Dryer Hourly HMA Production, Tons/hour	425	Natural Gas	1
Max Production Per day, Tons per day	10,200	LPG or Propane	1
Max Annual HMA Production, Tons/year	309,091	Default #2 fuel oil and used oil sulfur content percentage by weight	0.0015% and 0.5%
Min Hours of operation per year (annual/max hourly production)	727	#2 Fuel Oil Max Sulfur Content	0.5000%
		Used Oil/RFO4 Oil Max Sulfur Content	0.7500%

Asphaltic Oil Tank Heater AP-42, Section 11.1 (oil or natural gas fuel), or Section 1.4 (natural gas fuel)

Rated heat input capacity, MMBtu/hr	2.115	**Fuel Type(s)**	**Fuel Toggle**
Hours of operation per day	24	#2 Fuel Oil	1
Operation, days per year (DEQ Assumption)	166.67	Fuel oil sulfur content	0.500%
Max Hours of operation per year (DEQ Assumption)	4,000	Natural Gas	1

Asphaltic Oil Tank Heater Fuel Consumption Calculations	**#2 Fuel Oil**	**Natural Gas**
Heat Input Rating, MMBtu/hr	2.115	2.115
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]	15.43	2,074
Max Operational Hours per Year	4,000	4,000

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

IC Engine EI Conversion Factors

1 hp = 0.7456999 kW	0.7457	1 lb = (g)	453.59
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Fuel Heating Value, Btu/gal	137,030
		1 lb/gal=> Btu/gal =	137,030

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

NOTE: THE HMA EI SUMMARY WORKSHEETS ONLY ALLOWS ONE SMALL AND/OR ONE LARGE IC ENGINE.

IC Engine 1 < 600 bhp (447 kW) AP-42 Section 3.3 (diesel fueled)

IC Engine Make/Model	make/model	**Fuel Type(s)**	**IC Engine Toggle**
IC Engine Max Rated Power (bhp)	165	#2 Fuel Oil (Diesel)	1
IC Engine Max Rated Capacity (kW)	123	Max Sulfur weight percentage	0.0015%
		Max Operational Hours/Day	24
IC Engine 1 EPA Certification:	0	Max Operational Hours/Year	727
Not EPA-certified: Enter "0" (zero)		Calculated Max Fuel Use Rate, gal/hr	8.43
Certified Tier I, Tier 2, or Tier 3: Enter 1, 2, or 3		Calculated MMBtu/hr	1.16
Certified "BLUE SKY" engine: Enter 4			

IC Engine 2 > 600 bhp (447 kW) AP-42 Section 3.4 (diesel fueled)

IC Engine Make/Model	make/model	**Fuel Type(s)**	**IC Engine Toggle**
IC Engine Rated Capacity (bhp)	1,190	#2 Fuel Oil (Diesel)	1
IC Engine Max Rated Capacity (kW)	887	Max Sulfur weight percentage	0.0015%
		Max Operational Hours per Day	24
IC Engine 2 EPA Certification:	0	Max Operational Hours per Year	727
Not EPA-certified: Enter "0" (zero)		Calculated Max Fuel Use Rate, gal/hr	60.79
Certified Tier I, Tier 2, or Tier 3: Enter 1, 2, or 3		Calculated MMBtu/hr	8.33
Certified "BLUE SKY" engine: Enter 5			

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 tr		
M = moisture content (%)	3	Bulk aggregate for HMAstypically stabilizes at 3 to 5% by weight.
If higher moisture is maintained, apply additional % control:	90.00%	For M=3% add 10% control. For M=5% add 15% control. 90% cont
Number of front-end loader drop points (aggregate and RAP) (DEQ Assumption)	2	Drops to storage pile(s) and drop(s) to bins
Aggregate weigh conveyor transfer points (DEQ Assumption)	2	Transfer from bins to conveyor & from conveyor to scalping screen
Number of scalping screens (DEQ Assumption)	1	Includes all aggregate and RAP tonnage.
Aggregate conveyor transfer to drum (DEQ Assumption)	1	Includes all aggregate and RAP tonnage.

Facility: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID:** **P-20XX.XXXX** **XXX-XXXXX**

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

Fuel Type Toggle = 1
Max Hourly Production 425 T/hr
Max Daily Production 10,200 Tons/day
Max Annual Production 309,091 Tons/yr

User Input Weight % Sulfur = 0.7500%
AP-42 EF of 0.058 lb SO2/ton presumed based on #2 oil, max 0.5% sulfur content
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 1.50

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	14.03	5.10	
PM-10 (total) [b]	0.023	9.78	3.55	
PM-2.5 [b1]	0.0223	9.48	3.45	
CO [c]	0.13	55.25	20.09	
NOx [c]	0.055	23.38	8.50	
SO_2 [c]	0.089	56.74	20.63	
VOC [d]	0.032	13.60	4.95	
Lead	1.50E-05	6.38E-03	2.32E-03	
HCl [d,e]	0.00021	0.08925	3.25E-02	
Dioxins[e,f]				
2,3,7,8-TCDD	2.10E-13	8.93E-11	3.25E-11	**7.41E-12**
Total TCDD	9.30E-13	3.95E-10	1.44E-10	**3.28E-11**
1,2,3,7,8-PeCDD	3.10E-13	1.32E-10	4.79E-11	**1.09E-11**
Total PeCDD	2.20E-11	9.35E-09	3.40E-09	**7.76E-10**
1,2,3,4,7,8-HxCDD	4.20E-13	1.79E-10	6.49E-11	**1.48E-11**
1,2,3,6,7,8-HxCDD	1.30E-12	5.53E-10	2.01E-10	**4.59E-11**
1,2,3,7,8,9-HxCDD	9.80E-13	4.17E-10	1.51E-10	**3.46E-11**
Total HxCDD	1.20E-11	5.10E-09	1.85E-09	**4.23E-10**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	2.04E-09	7.42E-10	**1.69E-10**
Total HpCDD	1.90E-11	8.08E-09	2.94E-09	**6.70E-10**
Octa CDD	2.50E-11	1.06E-08	3.86E-09	**8.82E-10**
Total PCDD[h]	7.90E-11	3.36E-08	1.22E-08	**2.79E-09**
Furans[e,f]				
2,3,7,8-TCDF	9.70E-13	4.12E-10	1.50E-10	**3.42E-11**
Total TCDF	3.70E-12	1.57E-09	5.72E-10	**1.31E-10**
1,2,3,7,8-PeCDF	4.30E-12	1.83E-09	6.65E-10	**1.52E-10**
2,3,4,7,8-PeCDF	8.40E-13	3.57E-10	1.30E-10	**2.96E-11**
Total PeCDF	8.40E-11	3.57E-08	1.30E-08	**2.96E-09**
1,2,3,4,7,8-HxCDF	4.00E-12	1.70E-09	6.18E-10	**1.41E-10**
1,2,3,6,7,8-HxCDF	1.20E-12	5.10E-10	1.85E-10	**4.23E-11**
2,3,4,6,7,8-HxCDF	1.90E-12	8.08E-10	2.94E-10	**6.70E-11**
1,2,3,7,8,9-HxCDF	8.40E-12	3.57E-09	1.30E-09	**2.96E-10**
Total HxCDF	1.30E-11	5.53E-09	2.01E-09	**4.59E-10**
1,2,3,4,6,7,8-HpCDF	6.50E-12	2.76E-09	1.00E-09	**2.29E-10**
1,2,3,4,7,8,9-HpCDF	2.70E-12	1.15E-09	4.17E-10	**9.53E-11**
Total HpCDF	1.00E-11	4.25E-09	1.55E-09	**3.53E-10**
Octa CDF	4.80E-12	2.04E-09	7.42E-10	**1.69E-10**
Total PCDF[h]	4.00E-11	1.70E-08	6.18E-09	**1.41E-09**
Total PCDD/PCDF[h]	1.20E-10	5.10E-08	1.85E-08	**4.23E-09**
Non-PAH HAPs[f]				
Acetaldehyde[e]	1.30E-03	5.53E-01	2.01E-01	**4.59E-02**
Acrolein[e]	2.60E-05	1.11E-02	4.02E-03	1.11E-02
Benzene[e]	3.90E-04	1.66E-01	6.03E-02	**1.38E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	1.02E-01	3.71E-02	1.02E-01
Formaldehyde[e]	3.10E-03	1.32E+00	4.79E-01	**1.09E-01**
Hexane[e]	9.20E-04	3.91E-01	1.42E-01	3.91E-01
Isooctane	4.00E-05	1.70E-02	6.18E-03	1.70E-02
Methyl Ethyl Ketone[e]	2.00E-05	8.50E-03	3.09E-03	8.50E-03
Pentane[e]				
Propionaldehyde[e]	1.30E-04	5.53E-02	2.01E-02	5.53E-02
Quinone[e]	1.60E-04	6.80E-02	2.47E-02	6.80E-02
Methyl chloroform[e]	4.80E-05	2.04E-02	7.42E-03	2.04E-02
Toluene[e]	2.90E-03	1.23E+00	4.48E-01	1.23E+00
Xylene[e]	2.00E-04	8.50E-02	3.09E-02	8.50E-02
POM (7-PAH Group)		2.33E-04		**1.93E-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	7.23E-02	2.63E-02	**6.00E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	5.95E-04	2.16E-04	**4.94E-05**
Acenaphthylene	2.20E-05	9.35E-03	3.40E-03	**7.76E-04**
Anthracene	3.10E-06	1.32E-03	4.79E-04	**1.09E-04**
Benzo(a)anthracene	2.10E-07	8.93E-05	3.25E-05	**7.41E-06**
Benzo(a)pyrene[e]	9.80E-09	4.17E-06	1.51E-06	**3.46E-07**
Benzo(b)fluoranthene	1.00E-07	4.25E-05	1.55E-05	**3.53E-06**
Benzo(e)pyrene	1.10E-07	4.68E-05	1.70E-05	**3.88E-06**
Benzo(g,h,i)perylene	4.00E-08	1.70E-05	6.18E-06	**1.41E-06**
Benzo(k)fluoranthene	4.10E-08	1.74E-05	6.34E-06	**1.45E-06**
Chrysene	1.80E-07	7.65E-05	2.78E-05	**6.35E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.59E-04	9.43E-05	**2.15E-05**
Fluorene	1.10E-05	4.68E-03	1.70E-03	**3.88E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.98E-06	1.08E-06	**2.47E-07**
Naphthalene[e]	6.50E-04	2.76E-01	1.00E-01	**2.29E-02**
Perylene	8.80E-09	3.74E-06	1.36E-06	**3.11E-07**
Phenanthrene	2.30E-05	9.78E-03	3.55E-03	**8.12E-04**
Pyrene	3.00E-06	1.28E-03	4.64E-04	**1.06E-04**
Non-HAP Organic Compounds[f]				
Acetone[e]	8.30E-04	3.53E-01	1.28E-01	3.53E-01
Benzaldehyde	1.10E-04	4.68E-02	1.70E-02	4.68E-02
Butane	6.70E-04	2.85E-01	1.04E-01	2.85E-01
Butyraldehyde	1.60E-04	6.80E-02	2.47E-02	6.80E-02
Crotonaldehyde[e]	8.60E-05	3.66E-02	1.33E-02	3.66E-02
Ethylene	7.00E-03	2.98E+00	1.08E+00	2.98E+00
Heptane	9.40E-03	4.00E+00	1.45E+00	4.00E+00
Hexanal	1.10E-04	4.68E-02	1.70E-02	4.68E-02
Isovaleraldehyde	3.20E-05	1.36E-02	4.95E-03	1.36E-02
2-Methyl-1-pentene	4.00E-03	1.70E+00	6.18E-01	1.70E+00
2-Methyl-2-butene	5.80E-04	2.47E-01	8.96E-02	2.47E-01
3-Methylpentane	1.90E-04	8.08E-02	2.94E-02	8.08E-02
1-Pentene	2.20E-03	9.35E-01	3.40E-01	9.35E-01
n-Pentane	2.10E-04	8.93E-02	3.25E-02	8.93E-02
Valeraldehyde[e]	6.70E-05	2.85E-02	1.04E-02	2.85E-02
Metals[g]				
Antimony[e]	1.80E-07	7.65E-05	2.78E-05	7.65E-05
Arsenic[e]	5.60E-07	2.38E-04	8.65E-05	**1.98E-05**
Barium[e]	5.80E-06	2.47E-03	8.96E-04	2.47E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	1.74E-04	6.34E-05	**1.45E-05**
Chromium[e]	5.50E-06	2.34E-03	8.50E-04	2.34E-03
Cobalt[e]	2.60E-08	1.11E-05	4.02E-06	1.11E-05
Copper[e]	3.10E-06	1.32E-03	4.79E-04	1.32E-03
Hexavalent Chromium[e]	4.50E-07	1.91E-04	6.95E-05	**1.59E-05**
Manganese[e]	7.70E-06	3.27E-03	1.19E-03	3.27E-03
Mercury[e]	2.60E-06	1.11E-03	4.02E-04	1.11E-03
Molybdenum[e]				
Nickel[e]	6.30E-05	2.68E-02	9.74E-03	**2.22E-03**
Phosphorus[e]	2.80E-05	1.19E-02	4.33E-03	1.19E-02
Silver[e]	4.80E-07	2.04E-04	7.42E-05	2.04E-04
Selenium[e]	3.50E-07	1.49E-04	5.41E-05	1.49E-04
Thallium[e]	4.10E-09	1.74E-06	6.34E-07	1.74E-06
Vanadium[e]				
Zinc[e]	6.10E-05	2.59E-02	9.43E-03	2.59E-02

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
In addition, for SO2 emissions the AP-42 EF of 0.058 lb/ton was adjusted twice. First, to account for the average sulfur content of the fuel used during the source test (0.44% by weight, three tests on waste oil), 0.058 to 0.066. Second, to account for the average scavenging factor of 63% down to 50%, 0.062 to 0.089.
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: **Facility Name**
2/16/2016 14:58 **Permit/ Facility ID: P-20XX.XXXX XXX-XXXXX**

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

Fuel Type Toggle =	1	
Max Hourly Production	425	Tons/hr
Max Daily Production	10,200	Tons/day
Max Annual Production	309,091	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	14.03	5.10	
PM-10 (total)[b]	0.023	9.78	3.55	
PM-2.5 [b1]	0.0223	9.48	3.45	
CO [c]	0.13	55.25	20.09	
NOx [c]	0.026	11.05	4.02	
SO_2 [c]	0.0034	1.45	0.53	
VOC [d]	0.032	13.60	4.95	
Lead	6.20E-07	2.64E-04	9.58E-05	
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	1.66E-01	6.03E-02	**1.38E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	1.02E-01	3.71E-02	1.02E-01
Formaldehyde[e]	3.10E-03	1.32E+00	4.79E-01	**1.09E-01**
Hexane[e]	9.20E-04	3.91E-01	1.42E-01	3.91E-01
Isooctane	4.00E-05	1.70E-02	6.18E-03	1.70E-02
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	2.04E-02	7.42E-03	2.04E-02
Toluene[e]	1.50E-04	6.38E-02	2.32E-02	6.38E-02
Xylene[e]	2.00E-04	8.50E-02	3.09E-02	8.50E-02
POM (7-PAH Group)		4.82E-02		**4.00E-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	3.15E-02	1.14E-02	**2.61E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	5.95E-04	2.16E-04	**4.94E-05**
Acenaphthylene	8.60E-06	3.66E-03	1.33E-03	**3.03E-04**
Anthracene	2.20E-07	9.35E-05	3.40E-05	**7.76E-06**
Benzo(a)anthracene	2.10E-07	8.93E-05	3.25E-05	**7.41E-06**
Benzo(a)pyrene[e]	9.80E-09	4.17E-06	1.51E-06	**3.46E-07**
Benzo(b)fluoranthene	1.00E-07	4.25E-05	1.55E-05	**3.53E-06**
Benzo(e)pyrene	1.10E-07	4.68E-05	1.70E-05	**3.88E-06**
Benzo(g,h,I)perylene	4.00E-08	1.70E-05	6.18E-06	**1.41E-06**
Benzo(k)fluoranthene	4.10E-08	1.74E-05	6.34E-06	**1.45E-06**
Chrysene	1.80E-07	7.65E-05	2.78E-05	**6.35E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.59E-04	9.43E-05	**2.15E-05**
Fluorene	3.80E-06	1.62E-03	5.87E-04	**1.34E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.98E-06	1.08E-06	**2.47E-07**
Naphthalene[e]	9.00E-05	3.83E-02	1.39E-02	**3.18E-03**
Perylene	8.80E-09	3.74E-06	1.36E-06	**3.11E-07**
Phenanthrene	7.60E-06	3.23E-03	1.17E-03	**2.68E-04**
Pyrene	5.40E-07	2.30E-04	8.35E-05	**1.91E-05**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.85E-01	1.04E-01	2.85E-01
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.98E+00	1.08E+00	2.98E+00
Heptane	9.40E-03	4.00E+00	1.45E+00	4.00E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.70E+00	6.18E-01	1.70E+00
2-Methyl-2-butene	5.80E-04	2.47E-01	8.96E-02	2.47E-01
3-Methylpentane	1.90E-04	8.08E-02	2.94E-02	8.08E-02
1-Pentene	2.20E-03	9.35E-01	3.40E-01	9.35E-01
n-Pentane	2.10E-04	8.93E-02	3.25E-02	8.93E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	7.65E-05	2.78E-05	7.65E-05
Arsenic[e]	5.60E-07	2.38E-04	8.65E-05	**1.98E-05**
Barium[e]	5.80E-06	2.47E-03	8.96E-04	2.47E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	1.74E-04	6.34E-05	**1.45E-05**
Chromium[e]	5.50E-06	2.34E-03	8.50E-04	2.34E-03
Cobalt[e]	2.60E-08	1.11E-05	4.02E-06	1.11E-05
Copper[e]	3.10E-06	1.32E-03	4.79E-04	1.32E-03
Hexavalent Chromium[e]	4.50E-07	1.91E-04	6.95E-05	**1.59E-05**
Manganese[e]	7.70E-06	3.27E-03	1.19E-03	3.27E-03
Mercury[e]	2.40E-07	1.02E-04	3.71E-05	1.02E-04
Molybdenum[e]				
Nickel[e]	6.30E-05	2.68E-02	9.74E-03	**2.22E-03**
Phosphorus[e]	2.80E-05	1.19E-02	4.33E-03	1.19E-02
Silver[e]	4.80E-07	2.04E-04	7.42E-05	2.04E-04
Selenium[e]	3.50E-07	1.49E-04	5.41E-05	1.49E-04
Thallium[e]	4.10E-09	1.74E-06	6.34E-07	1.74E-06
Vanadium[e]				
Zinc[e]	6.10E-05	2.59E-02	9.43E-03	2.59E-02

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: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

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

Fuel Type Toggle = 1
Hourly Production 425 T/hr
Daily Production 10,200 Tons/day
Max Annual Production 309,091 Tons/yr

User Input Weight % Sulfur = 0.5000%
AP-42 EF of 0.058 lb SO2/ton presumed based on #2 oil, max 0.5% sulfur content
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 1.000

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	14.03	5.10	
PM-10 (total) [b]	0.023	9.78	3.55	
PM-2.5 [b1]	0.0223	9.48	3.45	
CO [c]	0.13	55.25	20.09	
NOx [c]	0.055	23.38	8.50	
SO_2 [c]	0.089	37.83	13.75	
VOC [d]	0.032	13.60	4.95	
Lead	1.50E-05	6.38E-03	2.32E-03	
HCl [d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD	2.10E-13	8.93E-11	3.25E-11	**7.41E-12**
Total TCDD	9.30E-13	3.95E-10	1.44E-10	**3.28E-11**
1,2,3,7,8-PeCDD	3.10E-13	1.32E-10	4.79E-11	**1.09E-11**
Total PeCDD	2.20E-11	9.35E-09	3.40E-09	**7.76E-10**
1,2,3,4,7,8-HxCDD	4.20E-13	1.79E-10	6.49E-11	**1.48E-11**
1,2,3,6,7,8-HxCDD	1.30E-12	5.53E-10	2.01E-10	**4.59E-11**
1,2,3,7,8,9-HxCDD	9.80E-13	4.17E-10	1.51E-10	**3.46E-11**
Total HxCDD	1.20E-11	5.1E-09	1.85E-09	**4.23E-10**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	2.04E-09	7.42E-10	**1.69E-10**
Total HpCDD	1.90E-11	8.08E-09	2.94E-09	**6.70E-10**
Octa CDD	2.50E-11	1.06E-08	3.86E-09	**8.82E-10**
Total PCDD[h]	7.90E-11	3.36E-08	1.22E-08	**2.79E-09**
Furans[e]				
2,3,7,8-TCDF	9.70E-13	4.12E-10	1.50E-10	**3.42E-11**
Total TCDF	3.70E-12	1.57E-09	5.72E-10	**1.31E-10**
1,2,3,7,8-PeCDF	4.30E-12	1.83E-09	6.65E-10	**1.52E-10**
2,3,4,7,8-PeCDF	8.40E-13	3.57E-10	1.30E-10	**2.96E-11**
Total PeCDF	8.40E-11	3.57E-08	1.30E-08	**2.96E-09**
1,2,3,4,7,8-HxCDF	4.00E-12	1.7E-09	6.18E-10	**1.41E-10**
1,2,3,6,7,8-HxCDF	1.20E-12	5.1E-10	1.85E-10	**4.23E-11**
2,3,4,6,7,8-HxCDF	1.90E-12	8.08E-10	2.94E-10	**6.70E-11**
1,2,3,7,8,9-HxCDF	8.40E-12	3.57E-09	1.30E-09	**2.96E-10**
Total HxCDF	1.30E-11	5.53E-09	2.01E-09	**4.59E-10**
1,2,3,4,6,7,8-HpCDF	6.50E-12	2.76E-09	1.00E-09	**2.29E-10**
1,2,3,4,7,8,9-HpCDF	2.70E-12	1.15E-09	4.17E-10	**9.53E-11**
Total HpCDF	1.00E-11	4.25E-09	1.55E-09	**3.53E-10**
Octa CDF	4.80E-12	2.04E-09	7.42E-10	**1.69E-10**
Total PCDF[h]	4.00E-11	1.7E-08	6.18E-09	**1.41E-09**
Total PCDD/PCDF[h]	1.20E-10	5.1E-08	1.85E-08	**4.23E-09**
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	1.66E-01	6.03E-02	**1.38E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	1.02E-01	3.71E-02	1.02E-01
Formaldehyde[e]	3.10E-03	1.32E+00	4.79E-01	**1.09E-01**
Hexane[e]	9.20E-04	3.91E-01	1.42E-01	3.91E-01
Isooctane	4.00E-05	1.70E-02	6.18E-03	1.70E-02
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	2.04E-02	7.42E-03	2.04E-02
Toluene[e]	2.90E-03	1.23E+00	4.48E-01	1.23E+00
Xylene[e]	2.00E-04	8.50E-02	3.09E-02	8.50E-02
POM (7-PAH Group)		2.33E-04		**1.93E-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	7.23E-02	2.63E-02	**6.00E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	5.95E-04	2.16E-04	**4.94E-05**
Acenaphthylene	2.20E-05	9.35E-03	3.40E-03	**7.76E-04**
Anthracene	3.10E-06	1.32E-03	4.79E-04	**1.09E-04**
Benzo(a)anthracene	2.10E-07	8.93E-05	3.25E-05	**7.41E-06**
Benzo(a)pyrene[e]	9.80E-09	4.17E-06	1.51E-06	**3.46E-07**
Benzo(b)fluoranthene	1.00E-07	4.25E-05	1.55E-05	**3.53E-06**
Benzo(e)pyrene	1.10E-07	4.68E-05	1.70E-05	**3.88E-06**
Benzo(g,h,I)perylene	4.00E-08	1.70E-05	6.18E-06	**1.41E-06**
Benzo(k)fluoranthene	4.10E-08	1.74E-05	6.34E-06	**1.45E-06**
Chrysene	1.80E-07	7.65E-05	2.78E-05	**6.35E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.59E-04	9.43E-05	**2.15E-05**
Fluorene	1.10E-05	4.68E-03	1.70E-03	**3.88E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.98E-06	1.08E-06	**2.47E-07**
Naphthalene[e]	0.00065	2.76E-01	1.00E-01	**2.29E-02**
Perylene	8.80E-09	3.74E-06	1.36E-06	**3.11E-07**
Phenanthrene	2.30E-05	9.78E-03	3.55E-03	**8.12E-04**
Pyrene	3.00E-06	1.28E-03	4.64E-04	**1.06E-04**
Non-HAP Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.85E-01	1.04E-01	2.85E-01
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.98E+00	1.08E+00	2.98E+00
Heptane	9.40E-03	4.00E+00	1.45E+00	4.00E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.70E+00	6.18E-01	1.70E+00
2-Methyl-2-butene	5.80E-04	2.47E-01	8.96E-02	2.47E-01
3-Methylpentane	1.90E-04	8.08E-02	2.94E-02	8.08E-02
1-Pentene	2.20E-03	9.35E-01	3.40E-01	9.35E-01
n-Pentane	2.10E-04	8.93E-02	3.25E-02	8.93E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	7.65E-05	2.78E-05	7.65E-05
Arsenic[e]	5.60E-07	2.38E-04	8.65E-05	**1.98E-05**
Barium[e]	5.80E-06	2.47E-03	8.96E-04	2.47E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	1.74E-04	6.34E-05	**1.45E-05**
Chromium[e]	5.50E-06	2.34E-03	8.50E-04	2.34E-03
Cobalt[e]	2.60E-08	1.11E-05	4.02E-06	1.11E-05
Copper[e]	3.10E-06	1.32E-03	4.79E-04	1.32E-03
Hexavalent Chromium[e]	4.50E-07	1.91E-04	6.95E-05	**1.59E-05**
Manganese[e]	7.70E-06	3.27E-03	1.19E-03	3.27E-03
Mercury[e]	2.60E-06	1.11E-03	4.02E-04	1.11E-03
Molybdenum[e]				
Nickel[e]	6.30E-05	2.68E-02	9.74E-03	**2.22E-03**
Phosphorus[e]	2.80E-05	1.19E-02	4.33E-03	1.19E-02
Silver[e]	4.80E-07	2.04E-04	7.42E-05	2.04E-04
Selenium[e]	3.50E-07	1.49E-04	5.41E-05	1.49E-04
Thallium[e]	4.10E-09	1.74E-06	6.34E-07	1.74E-06
Vanadium[e]				
Zinc[e]	6.10E-05	2.59E-02	9.43E-03	2.59E-02

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
In addition, for SO2 emissions the AP-42 EF of 0.058 lb/ton was adjusted twice. First, to account for the average sulfur content of the fuel used during the source test (0.44% by weight, three tests on waste oil), 0.058 to 0.066. Second, to account for the average scavenging factor of 63% down to 50%, 0.062 to 0.089.
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: **Facility Name**
2/16/2016 14:58 **Permit/ Facility ID: P-20XX.XXXX XXX-XXXXX**

LPG or Propane Fired Drum Mix Asphalt Plant With Fabric Filter

Fuel Type Toggle = 1
Max Hourly Production 425 Tons/hr
Max Daily Production 10,200 Tons/day
Max Annual Production 309,091 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	14.03	5.10	
PM-10 (total)[b]	0.023	9.78	3.55	
PM-2.5 [b1]	0.0223	9.48	3.45	
CO [c]	0.13	55.25	20.09	
NOx [c1] (Natural Gas EF x 1.5)	0.039	16.58	6.03	
SO_2 [c]	0.0034	1.45	0.53	
VOC [d]	0.032	13.60	4.95	
Lead	6.20E-07	0.0002635	9.58E-05	
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	1.66E-01	6.03E-02	**1.38E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	1.02E-01	3.71E-02	1.02E-01
Formaldehyde[e]	3.10E-03	1.32E+00	4.79E-01	**1.09E-01**
Hexane[e]	9.20E-04	3.91E-01	1.42E-01	3.91E-01
Isooctane	4.00E-05	1.70E-02	6.18E-03	1.70E-02
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	2.04E-02	7.42E-03	2.04E-02
Toluene[e]	1.50E-04	6.38E-02	2.32E-02	6.38E-02
Xylene[e]	2.00E-04	8.50E-02	3.09E-02	8.50E-02
POM (7-PAH Group)		2.33E-04		**1.93E-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	3.15E-02	1.14E-02	**2.61E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	5.95E-04	2.16E-04	**4.94E-05**
Acenaphthylene	8.60E-06	3.66E-03	1.33E-03	**3.03E-04**
Anthracene	2.20E-07	9.35E-05	3.40E-05	**7.76E-06**
Benzo(a)anthracene	2.10E-07	8.93E-05	3.25E-05	**7.41E-06**
Benzo(a)pyrene[e]	9.80E-09	4.17E-06	1.51E-06	**3.46E-07**
Benzo(b)fluoranthene	1.00E-07	4.25E-05	1.55E-05	**3.53E-06**
Benzo(e)pyrene	1.10E-07	4.68E-05	1.70E-05	**3.88E-06**
Benzo(g,h,i)perylene	4.00E-08	1.70E-05	6.18E-06	**1.41E-06**
Benzo(k)fluoranthene	4.10E-08	1.74E-05	6.34E-06	**1.45E-06**
Chrysene	1.80E-07	7.65E-05	2.78E-05	**6.35E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.59E-04	9.43E-05	**2.15E-05**
Fluorene	3.80E-06	1.62E-03	5.87E-04	**1.34E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.98E-06	1.08E-06	**2.47E-07**
Naphthalene[e]	9.00E-05	3.83E-02	1.39E-02	**3.18E-03**
Perylene	8.80E-09	3.74E-06	1.36E-06	**3.11E-07**
Phenanthrene	7.60E-06	3.23E-03	1.17E-03	**2.68E-04**
Pyrene	5.40E-07	2.30E-04	8.35E-05	**1.91E-05**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.85E-01	1.04E-01	2.85E-01
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.98E+00	1.08E+00	2.98E+00
Heptane	9.40E-03	4.00E+00	1.45E+00	4.00E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.70E+00	6.18E-01	1.70E+00
2-Methyl-2-butene	5.80E-04	2.47E-01	8.96E-02	2.47E-01
3-Methylpentane	1.90E-04	8.08E-02	2.94E-02	8.08E-02
1-Pentene	2.20E-03	9.35E-01	3.40E-01	9.35E-01
n-Pentane	2.10E-04	8.93E-02	3.25E-02	8.93E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	7.65E-05	2.78E-05	7.65E-05
Arsenic[e]	5.60E-07	2.38E-04	8.65E-05	**1.98E-05**
Barium[e]	5.80E-06	2.47E-03	8.96E-04	2.47E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	1.74E-04	6.34E-05	**1.45E-05**
Chromium[e]	5.50E-06	2.34E-03	8.50E-04	2.34E-03
Cobalt[e]	2.60E-08	1.11E-05	4.02E-06	1.11E-05
Copper[e]	3.10E-06	1.32E-03	4.79E-04	1.32E-03
Hexavalent Chromium[e]	4.50E-07	1.91E-04	6.95E-05	**1.59E-05**
Manganese[e]	7.70E-06	3.27E-03	1.19E-03	3.27E-03
Mercury[e]	2.40E-07	1.02E-04	3.71E-05	1.02E-04
Molybdenum[e]				
Nickel[e]	6.30E-05	2.68E-02	9.74E-03	**2.22E-03**
Phosphorus[e]	2.80E-05	1.19E-02	4.33E-03	1.19E-02
Silver[e]	4.80E-07	2.04E-04	7.42E-05	2.04E-04
Selenium[e]	3.50E-07	1.49E-04	5.41E-05	1.49E-04
Thallium[e]	4.10E-09	1.74E-06	6.34E-07	1.74E-06
Vanadium[e]				
Zinc[e]	6.10E-05	2.59E-02	9.43E-03	2.59E-02

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.

2/16/2016 14:58 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

Asphalt Tank Heater - #2 Oil Fired, Estimated Emissions Using AP-42 Sections 11.1 (HMA Plants) & 1.3 (Fuel Oil Combustion)

Fuel Type Toggle = 1
Fuel Consumption Rate 15.43 gal/hr
Max Daily Operation 24 hr/day
Max Annual Operation 4,000 hrs/yr

User Input Weight % Sulfur = 0.5000%
AP-42 1.3-1 EF is 0.142S lb SO2 per gallon of fuel oil

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	5.09E-02	0.10	
PM-10 (total)[b] (filterable+cond)	0.0023	3.55E-02	0.07	
PM-2.5 (total)[b] (filterable+cond)	0.00154	0.024	0.05	
CO[b] ("C" EF Rating Factor)	0.005	7.72E-02	0.15	
NOx[b]	0.024	3.70E-01	0.74	
SO_2[b]	0.071	1.10	2.19	
VOC[d] (NMTOC EF)	5.56E-04	8.58E-03	1.72E-02	
Lead[f]	1.51E-06	2.33E-05	4.66E-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	1.06E-11	2.13E-11	**4.86E-12**
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]	7.60E-13	1.17E-11	2.35E-11	**5.36E-12**
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]	1.50E-11	2.32E-10	4.63E-10	**1.06E-10**
Total HpCDD[c]	2.00E-11	3.09E-10	6.17E-10	**1.41E-10**
Octa CDD[c]	1.60E-10	2.47E-09	4.94E-09	**1.13E-09**
Total PCDD[c]	2.00E-10	3.09E-09	6.17E-09	**1.41E-09**
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]	3.30E-12	5.09E-11	1.02E-10	**2.33E-11**
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]	4.80E-13	7.41E-12	1.48E-11	**3.38E-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	3.09E-11	6.17E-11	**1.41E-11**
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]	9.70E-12	1.50E-10	2.99E-10	**6.84E-11**
Octa CDF[c]	1.20E-11	1.85E-10	3.70E-10	**8.46E-11**
Total PCDF[c]	3.10E-11	4.78E-10	9.57E-10	**2.18E-10**
Total PCDD/PCDF[c]	2.30E-10	3.55E-09	7.10E-09	**1.62E-09**
Non-PAH HAPs				
Acetaldehyde•				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	3.50E-06	5.40E-05	1.08E-04	**2.47E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
POM (7-PAH Group)		1.54E-06		**7.05E-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	8.18E-06	1.64E-05	**3.74E-06**
Acenaphthylene[c]	2.00E-07	3.09E-06	6.17E-06	**1.41E-06**
Anthracene[c]	1.80E-07	2.78E-06	5.56E-06	**1.27E-06**
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene[c]	1.00E-07	1.54E-06	3.09E-06	**7.05E-07**
Benzo(e)pyrene				
Benzo(g,h,I)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a.h)anthracene				
Dichlorobenzene				
Fluoranthene[c]	4.40E-08	6.79E-07	1.36E-06	**3.10E-07**
Fluorene[c]	3.20E-08	4.94E-07	9.88E-07	**2.26E-07**
Indeno(1,2,3-cd)pyrene				
Naphthalene[c,e]	1.70E-05	2.62E-04	5.25E-04	**1.20E-04**
Perylene				
Phenanthrene[c]	4.90E-06	7.56E-05	1.51E-04	**3.45E-05**
Pyrene[c]	3.20E-08	4.94E-07	9.88E-07	**2.26E-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	8.10E-05	1.62E-04	8.10E-05
Arsenic[e]	1.32E-06	2.04E-05	4.07E-05	**9.30E-06**
Barium[e]	2.57E-06	3.97E-05	7.93E-05	3.97E-05
Beryllium[e]	2.78E-08	4.29E-07	8.58E-07	**1.96E-07**
Cadmium[e]	3.98E-07	6.14E-06	1.23E-05	**2.81E-06**
Chromium[e]	8.45E-07	1.30E-05	2.61E-05	1.30E-05
Cobalt[e]	6.02E-06	9.29E-05	1.86E-04	9.29E-05
Copper[e]	1.76E-06	2.72E-05	5.43E-05	2.72E-05
Hexavalent Chromium[e]	2.48E-07	3.83E-06	7.66E-06	**1.75E-06**
Manganese[e]	3.00E-06	4.63E-05	9.26E-05	4.63E-05
Mercury[e]	1.13E-07	1.74E-06	3.49E-06	1.74E-06
Molybdenum[e]	7.87E-07	1.21E-05	2.43E-05	1.21E-05
Nickel[e]	8.45E-05	1.30E-03	2.61E-03	**5.96E-04**
Phosphorus[e]	9.46E-06	1.46E-04	2.92E-04	1.46E-04
Silver[e]				
Selenium[e]	6.83E-07	1.05E-05	2.11E-05	1.05E-05
Thallium[e]				
Vanadium[e]	3.18E-05	4.91E-04	9.82E-04	4.91E-04
Zinc[e]	2.91E-05	4.49E-04	8.98E-04	4.49E-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, PM10 is 1.3 lb/1,000 gal + 50% of 2.0 lb/1,000 g
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 Distillate Fuel Oil Combustion; Commercial 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: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID:** **P-20XX.XXXX** **XXX-XXXXX**

Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP-42 Section 11.1 (Hot Mix Asphalt Plants)

Fuel Type Toggle =	1	
Fuel Consumption Rate	2,074	scf/hr
Max Daily Operation	24	hr/day
Max Annual Operation	4,000	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)				
PM-2.5				
CO [c]	**8.90E-06**	1.85E-02	3.69E-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	5.39E-05	1.08E-04	**2.46E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
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: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID:** **P-20XX.XXXX** **XXX-XXXXX**

Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP-42 Section 1.4 (Natural Gas Combustion)

Fuel Type Toggle = 1
Fuel Consumption Rate 2,074 scf/hr
Max Daily Operation 24 hr/day
Max Annual Operation 4,000 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	1.58E-02	3.15E-02	
PM-10 (total)[c]	7.6	1.58E-02	3.15E-02	
PM-2.5	7.6	1.58E-02	3.15E-02	
CO [b]	84	1.74E-01	3.48E-01	
NOx [b]	100	2.07E-01	4.15E-01	
SO_2 [c]	0.6	1.24E-03	2.49E-03	
VOC [c]	5.5	1.14E-02	2.28E-02	
Lead [c]	5.00E-04	1.04E-06	2.07E-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	4.35E-06	8.71E-06	**1.99E-06**
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[e]	7.50E-02	1.56E-04	3.11E-04	**7.10E-05**
Hexane[e]	1.80E+00	3.73E-03	7.46E-03	3.73E-03
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[c1, e]	2.60E+00	5.39E-03	1.08E-02	5.39E-03
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c1, e]	3.40E-03	7.05E-06	1.41E-05	7.05E-06
Xylene[e]				
POM (7-PAH Group)		2.36E-08		**1.08E-08**

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	4.98E-08	9.95E-08	**2.27E-08**
3-Methylchloranthrene [c1, e]	1.80E-06	3.73E-09	7.46E-09	**1.70E-09**
Acenaphthene[c1]	1.80E-06	3.73E-09	7.46E-09	**1.70E-09**
Acenaphthylene[c1]	1.80E-06	3.73E-09	7.46E-09	**1.70E-09**
Anthracene[c1]	2.40E-06	4.98E-09	9.95E-09	**2.27E-09**
Benzo(a)anthracene[c1]	1.80E-06	3.73E-09	7.46E-09	**1.70E-09**
Benzo(a)pyrene[c1, e]	1.20E-06	2.49E-09	4.98E-09	**1.14E-09**
Benzo(b)fluoranthenec[1]	1.80E-06	3.73E-09	7.46E-09	**1.70E-09**
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c1]	1.20E-06	2.49E-09	4.98E-09	**1.14E-09**
Benzo(k)fluoranthene[c1]	1.80E-06	3.73E-09	7.46E-09	**1.70E-09**
Chrysene[c1]	1.80E-06	3.73E-09	7.46E-09	**1.70E-09**
Dibenzo(a,h)anthracene[c1]	1.20E-06	2.49E-09	4.98E-09	**1.14E-09**
Dichlorobenzene[c1]	1.20E-03	2.49E-06	4.98E-06	**1.14E-06**
Fluoranthene[c1]	3.00E-06	6.22E-09	1.24E-08	**2.84E-09**
Fluorene[c1]	2.80E-06	5.81E-09	1.16E-08	**2.65E-09**
Indeno(1,2,3-cd)pyrene[c1]	1.80E-06	3.73E-09	7.46E-09	**1.70E-09**
Naphthalene[c1, e]	6.10E-04	1.26E-06	2.53E-06	**5.78E-07**
Perylene				
Phenanthrene[c1]	1.70E-05	3.53E-08	7.05E-08	**1.61E-08**
Pyrene[c1]	5.00E-06	1.04E-08	2.07E-08	**4.73E-09**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane[c1]	2.10E+00	4.35E-03	8.71E-03	4.35E-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	4.15E-07	8.29E-07	**1.89E-07**
Barium[d,e]	4.40E-03	9.12E-06	1.82E-05	9.12E-06
Beryllium[e]	1.20E-05	2.49E-08	4.98E-08	**1.14E-08**
Cadmium[d,e]	1.10E-03	2.28E-06	4.56E-06	**1.04E-06**
Chromium[d,e]	1.40E-03	2.90E-06	5.81E-06	2.90E-06
Cobalt[d,e]	8.40E-05	1.74E-07	3.48E-07	1.74E-07
Copper[d,e]	8.50E-04	1.76E-06	3.53E-06	1.76E-06
Hexavalent Chromium[e]				
Manganese[d,e]				
Mercury[d,e]				
Molybdenum[d,e]	1.10E-03	2.28E-06	4.56E-06	2.28E-06
Nickel[d,e]				
Phosphorus[e]				
Silver[e]				
Selenium[d,e]				
Thallium[e]				
Vanadium[d,e]	2.30E-03	4.77E-06	9.54E-06	4.77E-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: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Silo Filling Operations AP-42 Section 11.1

Emissions Toggle = 1
Max Hourly Production 425 T/hr
Max Daily Production 10,200 Tons/day
Max Annual Production 309,091 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	0.2490	0.0905	
PM-10 (total)[b]	5.86E-04	0.2490	0.0905	
PM-2.5[b]	5.86E-04	0.2490	0.0905	
CO[b]	1.18E-03	0.5015	0.1824	
NOx				
SO_2				
VOC[d,g]	1.22E-04	5.18E-02	0.0188	
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	1.66E-03	6.03E-04	0.0001
1,3-Butadiene[e]				
Ethylbenzene[e]	4.63E-06	1.97E-03	7.16E-04	1.97E-03
Formaldehyde[e]	8.41E-05	3.57E-02	1.30E-02	0.0030
Hexane[e]	1.22E-05	5.18E-03	1.88E-03	5.18E-03
Isooctane	3.78E-08	1.61E-05	5.84E-06	1.61E-05
Methyl Ethyl Ketone[e]	4.75E-06	2.02E-03	7.35E-04	2.02E-03
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]		0.00E+00	0.00E+00	
Toluene[e]	7.56E-06	3.21E-03	1.17E-03	3.21E-03
Xylene[e]	3.13E-05	1.33E-02	4.84E-03	1.33E-02
POM (7-PAH Group)		2.87E-04		**2.38E-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	5.69E-03	2.07E-03	4.72E-04
3-Methylchloranthrene[e]				
Acenaphthene	1.19E-06	5.07E-04	1.84E-04	4.21E-05
Acenaphthylene	3.55E-08	1.51E-05	5.49E-06	1.25E-06
Anthracene	3.30E-07	1.40E-04	5.10E-05	1.16E-05
Benzo(a)anthracene	1.42E-07	6.04E-05	2.20E-05	5.02E-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	1.03E-05	3.73E-06	8.51E-07
Benzo(g,h,I)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	2.27E-04	8.24E-05	1.88E-05
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene				
Fluoranthene	3.81E-07	1.62E-04	5.89E-05	1.34E-05
Fluorene	2.56E-06	1.09E-03	3.96E-04	9.05E-05
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene[e]	4.62E-06	1.96E-03	7.14E-04	1.63E-04
Perylene	7.62E-08	3.24E-05	1.18E-05	2.69E-06
Phenanthrene	4.57E-06	1.94E-03	7.06E-04	1.61E-04
Pyrene	1.12E-06	4.75E-04	1.73E-04	3.94E-05
Non-HAP Organic Compounds				
Acetone[e]	6.70E-06	2.85E-03	0.0010	2.85E-03
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	1.34E-04	5.70E-02	0.0207	5.70E-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

		LOADOUT	SILO FILL	
Total PM EF = $0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)} + 000332+ 0.00105(-V)e^{((0.0251)(T+460)-20.}$	=	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: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Silo Filling Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle =	1	
Max Hourly Production	425	T/hr
Max Daily Production	10,200	Tons/day
Max Annual Production	309,091	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	2.54E-04	0.0001	2.54E-04
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	1.95E-06	8.29E-04	0.0003	8.29E-04
Chloroethane (Ethyl chloride[e])	4.87E-07	2.07E-04	0.0001	2.07E-04
Chloromethane (Methyl chloride[e])	2.80E-06	1.19E-03	0.0004	1.19E-03
Cumene[e]				
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	3.29E-08	1.40E-05	5.09E-06	1.40E-05
MTBE				
Styrene[e]	6.58E-07	2.80E-04	1.02E-04	2.80E-04
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	1.04E-02	0.0038	1.04E-02
o-Xylene[e] (added into Xylene[e])	6.95E-06	2.95E-03	0.0011	2.95E-03
Phenol[e,f]				
Non-HAP Organic Compounds				
Methane	3.17E-03	1.35E+00	0.4897	1.35E+00

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

Facility: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Load-out Operations AP-42 Section 11.1

Emissions Toggle = 1
Max Hourly Production 425 T/hr
Max Daily Production 10,200 Tons/day
Max Annual Production 309,091 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	0.222	0.08	
PM-10 (total) [b]	5.22E-04	0.222	0.08	
PM-2.5 [b]	5.22E-04	0.222	0.08	
CO [b]	1.35E-03	0.573	0.21	
NOx				
SO_2				
VOC [d,g]	3.91E-03	1.661	0.60	
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	9.19E-04	3.34E-04	**7.63E-05**
1,3-Butadiene[e]				
Ethylbenzene[e]	1.16E-05	4.95E-03	1.80E-03	4.95E-03
Formaldehyde[e]	3.66E-06	1.56E-03	5.66E-04	**1.29E-04**
Hexane[e]	6.24E-06	2.65E-03	9.64E-04	2.65E-03
Isooctane	7.49E-08	3.18E-05	1.16E-05	3.18E-05
Methyl Ethyl Ketone[e]	2.04E-06	8.66E-04	3.15E-04	8.66E-04
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]	8.73E-06	3.71E-03	1.35E-03	3.71E-03
Xylene[e]	5.03E-05	2.14E-02	7.78E-03	2.14E-02
POM (7-PAH Group)		1.96E-04		**1.62E-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	3.45E-03	1.25E-03	**2.86E-04**
3-Methylchloranthrene[e]				
Acenaphthene	8.86E-07	3.77E-04	1.37E-04	**3.13E-05**
Acenaphthylene	9.55E-08	4.06E-05	1.48E-05	**3.37E-06**
Anthracene	2.39E-07	1.01E-04	3.69E-05	**8.42E-06**
Benzo(a)anthracene	6.48E-08	2.75E-05	1.00E-05	**2.29E-06**
Benzo(a)pyrene[e]	7.84E-09	3.33E-06	1.21E-06	**2.77E-07**
Benzo(b)fluoranthene	2.59E-08	1.10E-05	4.00E-06	**9.14E-07**
Benzo(e)pyrene	2.66E-08	1.13E-05	4.11E-06	**9.38E-07**
Benzo(g,h,I)perylene	6.48E-09	2.75E-06	1.00E-06	**2.29E-07**
Benzo(k)fluoranthene	7.50E-09	3.19E-06	1.16E-06	**2.65E-07**
Chrysene	3.51E-07	1.49E-04	5.43E-05	**1.24E-05**
Dibenzo(a,h)anthracene	1.26E-09	5.36E-07	1.95E-07	**4.45E-08**
Dichlorobenzene				
Fluoranthene	1.70E-07	7.24E-05	2.63E-05	**6.01E-06**
Fluorene	2.63E-06	1.12E-03	4.06E-04	**9.26E-05**
Indeno(1,2,3-cd)pyrene	1.60E-09	6.81E-07	2.48E-07	**5.65E-08**
Naphthalene[e]	4.26E-06	1.81E-03	6.59E-04	**1.50E-04**
Perylene	7.50E-08	3.19E-05	1.16E-05	**2.65E-06**
Phenanthrene	2.76E-06	1.17E-03	4.27E-04	**9.74E-05**
Pyrene	5.11E-07	2.17E-04	7.90E-05	**1.80E-05**
Non-HAP Organic Compounds				
Acetone[e]	1.95E-06	8.27E-04	3.01E-04	8.27E-04
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	2.95E-05	1.25E-02	4.56E-03	1.25E-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

	LOADOUT	SILO FILL	
Total PM $EF = 0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)} + 000332+ 0.00105(-V)e^{((0.0251)(T+460)-20.}$ =	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: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Load-out Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle =	1	
Max Hourly Production	425	T/hr
Max Daily Production	10,200	Tons/day
Max Annual Production	309,091	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[g]				
Bromomethane[e]	3.99E-07	1.70E-04	6.17E-05	1.70E-04
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	5.41E-07	2.30E-04	8.36E-05	2.30E-04
Chloroethane (Ethyl chloride[e])	8.73E-09	3.71E-06	1.35E-06	3.71E-06
Chloromethane (Methyl chloride[e])	6.24E-07	2.65E-04	9.64E-05	2.65E-04
Cumene[e]	4.57E-06	1.94E-03	7.07E-04	1.94E-03
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])				
MTBE				
Styrene[e]	3.04E-07	1.29E-04	4.69E-05	1.29E-04
Tetrachloroethene (Tetrachloroethylene[e])	3.20E-07	1.36E-04	4.95E-05	1.36E-04
1,1,1-Trichloroethane (Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])				
Trichlorofluoromethane	5.41E-08	2.30E-05	8.36E-06	2.30E-05
m-/p-Xylene[e] (added into Xylene[e])	1.71E-05	7.25E-03	2.64E-03	7.25E-03
o-Xylene[e] (added into Xylene[e])	3.33E-05	1.41E-02	5.14E-03	1.41E-02
Phenol[e,f]	4.02E-06	1.71E-03	6.22E-04	1.71E-03
Non-HAP Organic Compounds				
Methane	2.70E-04	1.15E-01	4.18E-02	1.15E-01

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: **Facility Name**
2/16/2016 14:58 **Permit** **P-20XX.XXXX** **Facility ID: XXX-XXXXX**

G1 Electrical Generator < 600 hp (447 kW)

Fuel Type Toggle =	1	
Fuel Consumption Rate	8.43	gal/hr
Calculated MMBtu/hr	1.155	MMBtu/hr
Max Daily Operation	24	hr/day
Max Annual Operation	727	hrs/yr

Rated Power (kW):	**123**
Not EPA Certified:	Yes
Certified EPA Tier 1:	No
Certified EPA Tier 2:	No
Certified EPA Tier 3:	No
Blue Sky Engine:	No

Conversion Factors:

Avg brake-specific fuel consumption (BSFC) =	7000	Btu/hp-hr
1 hp =	0.746	kW
1 lb =	453.592	g

g/kW-hr x (lb/453g) x (hp-hr/7000 Btu) x (0.746 kW/hp) x 10^6 Btu/MMBtu = lb/MMBtu
g/kW-hr x 0.23486 = lb/MMBtu

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM = PM10
EMISSION FACTORS USED FOR G1 (lb/MMBtu):	**4.41**	**0.36**		**0.95**	**0.310**

AP-42, Ch 3.3 (10/96) EMISSION FACTORS (diesel fueled)

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM = PM10
Emission Factor (lb/MMBtu)	4.41	0.36		0.95	0.31
Emission Factor (g/kW-hr))	18.78	1.53		4.05	1.32

40 CFR 89 and 1039 (updated for <37 kW only), EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM = PM10
kW< 8	1	0	2000	---	0.36	2.47	1.88	0.23
kW< 8	2	0	2005	---	0.36	1.76	1.88	0.19
kW < 8	4	0	2008	---	---	1.76	1.88	0.09
kW< 8	BlueSky	0	n/a	---	0.36	1.08	1.88	0.11
8 < kW < 19	1	0	2000	---	0.36	2.23	1.55	0.19
8 < kW < 19	2	0	2005	---	0.36	1.76	1.55	0.19
8 < kW < 19	4	0	2008	---	---	1.76	1.55	0.19
8 ≤ kW < 19	BlueSky	0	n/a	---	0.36	1.06	1.55	0.11
19 < kW < 37	1	0	1999	---	0.36	2.23	1.29	0.19
19 < kW < 37	2	0	2004	---	0.36	1.76	1.29	0.14
19 < kW < 37	4	0	2008	---	---	1.76	1.29	0.07
19 ≤ kW < 37	BlueSky	0	n/a	---	0.36	1.06	1.29	0.08
37 < kW < 75	1	0	1998	2.16	0.36	---	1.17	0.31
37 < kW < 75	2	0	2004	---	0.36	1.76	1.17	0.09
37 < kW < 75	3	0	2008	---	0.36	1.10	1.17	0.09
37 ≤ kW < 75	BlueSky	0	n/a	---	0.36	1.10	1.17	0.06
75 < kW < 130	1	0	1997	2.16	0.36	---	1.17	0.31
75 < kW < 130	2	0	2003	---	0.36	1.55	1.17	0.07
75 < kW < 130	3	0	2007	---	0.36	0.94	1.17	0.07
75 ≤ kW < 130	BlueSky	0	n/a	---	0.36	0.94	1.17	0.04
130 ≤ kW < 225	1	0	1996	2.16	0.31	---	2.68	0.13
130 ≤ kW < 225	2	0	2003	---	0.31	1.55	0.82	0.05
130 ≤ kW < 225	3	0	2006	---	0.31	0.94	0.82	0.05
130 ≤ kW ≤ 560	BlueSky	0	n/a	---	0.31	0.94	0.82	0.03
225 < kW < 450	1	0	1996	2.16	0.31	---	2.68	0.13
225 < kW < 450	2	0	2001	---	0.31	1.50	0.82	0.05
225 ≤ kW < 450	3	0	2006	---	0.31	0.94	0.82	0.05
450 < kW < 560	1	0	1996	2.16	0.31	---	2.68	0.13
450 < kW < 560	2	0	2002	---	0.31	1.50	0.82	0.05
450 ≤ kW < 560	3	0	2006	---	0.31	0.94	0.82	0.05
kW > 560	1	0	2000	2.16	0.31	---	2.68	0.13
kW > 560	2	0	2006	---	0.31	1.50	0.82	0.05
kW > 560	BlueSky	0	n/a	---	0.31	0.89	0.82	0.03

40 CFR 89 and 1039 (updated for <37 kW only), EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM (= PM10)
kW< 8	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW< 8	2	0	2005	0.00	0.00	0.00	0.00	0.00
kW< 8	4	0	2008	0.00	---	0.00	0.00	0.00
kW< 8	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	1	0	2000	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	2	0	2005	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	4	0	2008	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
19 < kW < 37	1	0	1999	0.00	0.00	0.00	0.00	0.00
19 < kW < 37	2	0	2004	0.00	0.00	0.00	0.00	0.00
19 < kW < 37	4	0	2008	0.00	---	0.00	0.00	0.00
19 ≤ kW < 37	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	1	0	1998	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	2	0	2004	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	3	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	1	0	1997	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	2	0	2003	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	3	0	2007	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	1	0	1996	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	2	0	2003	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	3	0	2006	0.00	0.00	0.00	0.00	0.00
130 ≤ kW ≤ 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
225 < kW < 450	1	0	1996	0.00	0.00	0.00	0.00	0.00
225 < kW < 450	2	0	2001	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	3	0	2006	0.00	0.00	0.00	0.00	0.00
450 < kW < 560	1	0	1996	0.00	0.00	0.00	0.00	0.00
450 < kW < 560	2	0	2002	0.00	0.00	0.00	0.00	0.00
450 ≤ kW < 560	3	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW > 560	2	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
EMISSION FACTORS FOR GENERATOR G1 (lb/MMBTU):				**0.00**	**0.00**	**0.00**	**0.00**	**0.000**

Facility: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

IC Engine 1 Powering an Electrical Generator < 600 hp (447 kW) AP-42 Section 3.3 (diesel fueled)

Fuel Type Toggle = 1 123 kw
Fuel Consumption Rate 8.43 gal/hr
Calculated MMBtu/hr 1.155 MMBtu/hr
Max Daily Operation 24 hr/day
Max Annual Operation 727 hrs/yr

User Input Weight % Sulfur = 0.0015%
AP-42 3.3 SO2 EF = 0.29 for #2 fuel oil, presumed max 0.5%
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 0.00
Not an EPA-Certified Generator

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	0.358	1.30E-01	
PM-10 (total) [b]	0.31	0.358	1.30E-01	
PM-2.5	0.07	0.081	2.94E-02	
CO [b]	0.95	1.097	3.99E-01	
NOx[b]	4.41	5.094	1.85E+00	
SO_2 [b] (total SOx presumed SO2)	0.29	1.00E-03	1.10E-06	
VOC [b] (total TOC--> VOCs)	0.36	0.416	1.51E-01	
Lead				
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]				
1,2,3,6,7,8-HxCDD				
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	8.86E-04	3.22E-04	**7.35E-05**
Acrolein[c]	9.25E-05	1.07E-04	3.89E-05	1.07E-04
Benzene[c,e]	9.33E-04	1.08E-03	3.92E-04	**8.95E-05**
1,3-Butadiene[c,e]	3.91E-05	4.52E-05	1.64E-05	**3.75E-06**
Ethylbenzene[e]				
Formaldehyde[c,e]	1.18E-03	1.36E-03	4.96E-04	**1.13E-04**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	4.09E-04	4.72E-04	1.72E-04	4.72E-04
Xylene[c,e]	2.85E-04	3.29E-04	1.20E-04	3.29E-04
POM (7-PAH Group)		3.97E-06		**3.29E-07**

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	1.64E-06	5.96E-07	**1.36E-07**
Acenaphthylene[c]	5.06E-06	5.84E-06	2.13E-06	**4.85E-07**
Anthracene[c]	1.87E-06	2.16E-06	7.85E-07	**1.79E-07**
Benzo(a)anthracene[c]	1.68E-06	1.94E-06	7.06E-07	**1.61E-07**
Benzo(a)pyrene[c,e]	1.88E-07	2.17E-07	7.90E-08	**1.80E-08**
Benzo(b)fluoranthene[c]	9.91E-08	1.14E-07	4.16E-08	**9.50E-09**
Benzo(e)pyrene				
Benzo(g,h,I)perylene[c]	4.89E-07	5.65E-07	2.05E-07	**4.69E-08**
Benzo(k)fluoranthene[c]	1.55E-07	1.79E-07	6.51E-08	**1.49E-08**
Chrysene[c]	3.53E-07	4.08E-07	1.48E-07	**3.38E-08**
Dibenzo(a,h)anthracene[c]	5.83E-07	6.73E-07	2.45E-07	**5.59E-08**
Dichlorobenzene				
Fluoranthene[c]	7.61E-06	8.79E-06	3.20E-06	**7.30E-07**
Fluorene[c]	2.92E-05	3.37E-05	1.23E-05	**2.80E-06**
Indeno(1,2,3-cd)pyrene[c]	3.75E-07	4.33E-07	1.58E-07	**3.60E-08**
Naphthalene[c,e]	8.48E-05	9.79E-05	3.56E-05	**8.13E-06**
Perylene				
Phenanthrene[c]	2.94E-05	3.40E-05	1.23E-05	**2.82E-06**
Pyrene[c]	4.78E-06	5.52E-06	2.01E-06	**4.58E-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				
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: **Facility Name**
2/16/2016 14:58 **Permit** **P-20XX.XXXX** **Facility ID: XXX-XXXXX**

G2 Electrical Generator > 600 hp (447 kW)

Fuel Type Toggle =	1	
Fuel Consumption Rate	60.79	gal/hr
Calculated MMBtu/hr	8.33	MMBtu/hr
Max Daily Operation	24	hr/day
Max Annual Operation	727	hrs/yr

Rated Power (kW):	887
Not EPA Certified:	Yes
Certified EPA Tier 1:	No
Certified EPA Tier 2:	No
Certified EPA Tier 3:	No
Blue Sky Engine:	No

Conversion Factors:

Avg brake-specific fuel consumption (BSFC) =	7000	Btu/hp-hr
1 hp =	0.746	kW
1 lb =	453.592	g

g/kW-hr x (lb/453g) x (hp-hr/7000 Btu) x (0.746 kW/hp) x 10^6 Btu/MMBtu = lb/MMBtu
g/kW-hr x 0.23486 = lb/MMBtu

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM=PM10
EMISSION FACTORS USED FOR G2 (lb/MMBtu):	**3.20**	**0.09**		**0.85**	**0.130**

AP-42, Ch 3.4 (10/96) EMISSION FACTORS (diesel fueled, uncontrolled)

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM10
Emission Factor (lb/MMBtu)	3.2	0.09		0.85	0.13
Emission Factor (g/kW-hr))	13.63	0.38		3.62	0.55

Note: Rating for AP-42 PM10 EF of 0.0573 is "E" or Poor. Used Tier 1 PM EF and presumed PM = PM10

40 CFR 89, EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM = PM10
kW< 8	1	0	2000	---	0.36	2.47	1.88	0.23
kW< 8	2	0	2005	---	0.36	1.76	1.88	0.19
kW< 8	BlueSky	0	n/a	---	0.36	1.08	1.88	0.11
8 < kW < 19	1	0	2000	---	0.36	2.23	1.55	0.19
8 < kW < 19	2	0	2005	---	0.36	1.76	1.55	0.19
8 ≤ kW < 19	BlueSky	0	n/a	---	0.36	1.06	1.55	0.11
19 < kW < 37	1	0	1999	---	0.36	2.23	1.29	0.19
19 < kW < 37	2	0	2004	---	0.36	1.76	1.29	0.14
19 ≤ kW < 37	BlueSky	0	n/a	---	0.36	1.06	1.29	0.085
37 < kW < 75	1	0	1998	2.16	0.36	---	0.95	0.31
37 < kW < 75	2	0	2004	---	0.36	1.76	1.17	0.09
37 < kW < 75	3	0	2008	---	0.36	1.10	1.17	0.09
37 ≤ kW < 75	BlueSky	0	n/a	---	0.36	1.10	1.17	0.056
75 < kW < 130	1	0	1997	2.16	0.36	---	0.95	0.31
75 < kW < 130	2	0	2003	---	0.36	1.55	1.17	0.07
75 < kW < 130	3	0	2007	---	0.36	0.94	1.17	0.07
75 ≤ kW < 130	BlueSky	0	n/a	---	0.36	0.94		0.042
130 < kW < 225	1	0	1996	2.16	0.31	---	2.68	0.13
130 < kW < 225	2	0	2003	---	0.31	1.55	0.82	0.05
130 < kW < 225	3	0	2006	---	0.31	0.94	0.82	0.05
130 ≤ kW ≤ 560	BlueSky	0	n/a	---	0.31	0.94	0.82	0.028
225 < kW < 450	1	0	1996	2.16	0.31	---	2.68	0.13
225 < kW < 450	2	0	2001	---	0.31	1.50	0.82	0.05
225 ≤ kW < 450	3	0	2006	---	0.31	0.94	0.82	0.05
450 < kW < 560	1	0	1996	2.16	0.31	---	2.68	0.13
450 < kW ≤ 560	2	0	2002	---	0.31	1.50	0.82	0.05
450 ≤ kW ≤ 560	3	0	2006	---	0.31	0.94	0.82	0.05
kW > 560	1	0	2000	2.16	0.31	---	2.68	0.13
kW > 560	2	0	2006	---	0.31	1.50	0.82	0.05
kW > 560	BlueSky	0	n/a	---	0.31	0.89	0.82	0.028

40 CFR 89, EPA CERTIFIED GENERATOR EMISSION FACTORS FOR GENERATOR G1 (lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM10
kW< 8	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW< 8	2	0	2005	0.00	0.00	0.00	0.00	0.00
kW< 8	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	1	0	2000	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	2	0	2005	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
19 < kW < 37	1	0	1999	0.00	0.00	0.00	0.00	0.00
19 < kW < 37	2	0	2004	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	1	0	1998	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	2	0	2004	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	3	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	1	0	1997	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	2	0	2003	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	3	0	2007	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	1	0	1996	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	2	0	2003	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	3	0	2006	0.00	0.00	0.00	0.00	0.00
130 ≤ kW ≤ 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	1	0	1996	0.00	0.00	0.00	0.00	0.00
225 < kW < 450	2	0	2001	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	3	0	2006	0.00	0.00	0.00	0.00	0.00
450 < kW ≤ 560	1	0	1996	0.00	0.00	0.00	0.00	0.00
450 < kW ≤ 560	2	0	2002	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	3	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW > 560	2	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
EMISSION FACTORS FOR GENERATOR G2 (lb/MMBTU):				**0.00**	**0.00**	**0.00**	**0.00**	**0.000**

Facility: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID:** **P-20XX.XXXX XXX-XXXXX**

IC Engine 2 Powering an Electrical Generator > 600 hp (447 kW) AP-42 Section 3.4 (diesel fueled, uncontrolled)

Fuel Type Toggle =	1		887 kw	User Input Weight % Sulfur = 0.0015%
Fuel Consumption Rate	60.79	gal/hr		AP-42 3.4-1 SO2 EF = 1.01 x S
Calculated MMBtu/hr	8.33	MMBtu/hr		
Max Daily Operation	24	hr/day		Not an EPA-Certified Generator
Max Annual Operation	727	hrs/yr		

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	0.833	3.03E-01	6.92E-02
PM-10 (total) [d]	0.13	1.083	3.94E-01	8.99E-02
PM-2.5	0.0556	0.463	1.68E-01	3.85E-02
CO [b]	0.85	7.081	2.57E+00	
NOx[b]	3.20	26.656	9.69E+00	2.21E+00
SO_2 [b] (total SOx presumed SO2)	0.001515	0.013	0.005	1.05E-03
VOC [b] (total TOC--> VOCs)	0.09	0.750	0.273	
Lead				
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]				
1,2,3,6,7,8-HxCDD				
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	2.10E-04	7.63E-05	**1.74E-05**
Acrolein[c]	7.88E-06	6.56E-05	2.39E-05	6.56E-05
Benzene[c,e]	7.76E-04	6.46E-03	2.35E-03	**5.37E-04**
1,3-Butadiene[c,e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	7.89E-05	6.57E-04	2.39E-04	**5.46E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	2.81E-04	2.34E-03	8.51E-04	2.34E-03
Xylene[c,e]	1.93E-04	1.61E-03	5.85E-04	1.61E-03
POM (7-PAH Group)		3.75E-05		**3.11E-06**

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c1]	4.68E-06	3.90E-05	1.42E-05	**3.24E-06**
Acenaphthylene[c1]	9.23E-06	7.69E-05	2.80E-05	**6.38E-06**
Anthracene[c1]	1.23E-06	1.02E-05	3.73E-06	**8.51E-07**
Benzo(a)anthracene[c1]	6.22E-07	5.18E-06	1.88E-06	**4.30E-07**
Benzo(a)pyrene[c1,e]	2.57E-07	2.14E-06	7.78E-07	**1.78E-07**
Benzo(b)fluoranthene[c1]	1.11E-06	9.25E-06	3.36E-06	**7.68E-07**
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c1]	5.56E-07	4.63E-06	1.68E-06	**3.85E-07**
Benzo(k)fluoranthene[c1]	2.18E-07	1.82E-06	6.60E-07	**1.51E-07**
Chrysene[c1]	1.53E-06	1.27E-05	4.63E-06	**1.06E-06**
Dibenzo(a,h)anthracene[c1]	3.46E-07	2.88E-06	1.05E-06	**2.39E-07**
Dichlorobenzene				
Fluoranthene[c1]	4.03E-06	3.36E-05	1.22E-05	**2.79E-06**
Fluorene[c1]	1.28E-05	1.07E-04	3.88E-05	**8.85E-06**
Indeno(1,2,3-cd)pyrene[c1]	4.14E-07	3.45E-06	1.25E-06	**2.86E-07**
Naphthalene[c1,e]	1.30E-04	1.08E-03	3.94E-04	**8.99E-05**
Perylene				
Phenanthrene[c1]	4.08E-05	3.40E-04	1.24E-04	**2.82E-05**
Pyrene[c1]	3.71E-06	3.09E-05	1.12E-05	**2.57E-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 3.4-1, 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: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID:** **P-20XX.XXXX** **XXX-XXXXX**

Max Hourly Production	425 T/hr	96% T/hr is Aggregate & RAP =	**408 T/hr**
Max Daily Production	10,200 Tons/day	96% T/day is Aggregate & RAP =	**9,792 T/day**
Max Annual Production	309,091 Tons/yr	96% T/yr is Aggregate & RAP =	**296,727 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)

$E = k\,(0.0032) \times (U/5)^{1.3} / (M/2)^{1.4}$ = 3.31E-03 for PM 1.56E-03 lb/ton for PM10 2.37E-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 =	**3 %**		

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	F = Eavg mph/ E@10mph
Cat 1:	1.54	0.77	1.72	1.59E-04	0.1016	2.41E-05	0.1016
Cat 2:	3.09	2.32	5.18	6.65E-04	0.4251	1.01E-04	0.4251
Cat 3:	5.14	4.12	9.20	1.40E-03	0.8979	2.13E-04	0.8979
Cat 4:	8.23	6.69	14.95	2.64E-03	1.687	3.99E-04	1.687
Cat 5:	10.80	9.52	21.28	4.17E-03	2.670	6.32E-04	2.670
Cat 6:	14.00	12.40	27.74	5.89E-03	3.767	8.92E-04	3.767

Aggregate Front End Loader Drop Points

Drop to storage pile and drop to bins: **408 T/hr** **2** Transfer Points

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (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	Total Emissions: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	1.35	1.35	0.49	0.11	2.70	2.70	0.98	0.22
PM-10 (total)	1.56E-03	0.64	0.64	0.23	0.05	1.28	1.28	0.46	0.11
PM-2.5	2.37E-04	0.10	0.10	0.04	0.01	0.19	0.19	0.07	0.02

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 **90%** control to lb/hr, etc. for the higher moisture.

Aggregate Weigh Conveyor

Transfer from bins to conveyor and from conveyor to scalping screen: **408 T/hr** **2** Transfer Points

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (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	Total Emissions: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	1.35E-01	1.35E-01	4.90E-02	1.12E-02	2.70E-01	2.70E-01	9.81E-02	2.24E-02
PM-10 (total)	1.56E-03	6.38E-02	6.38E-02	2.32E-02	5.30E-03	1.28E-01	1.28E-01	4.64E-02	1.06E-02
PM-2.5	2.37E-04	9.66E-03	9.66E-03	3.51E-03	8.02E-04	1.93E-02	1.93E-02	7.02E-03	1.60E-03

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

Aggregate flow across scalping screen onto conveyor: **408 T/hr**

Pollutant	Emission Factor Table 11.19.2-2 SCREENING UNCONTROLLED (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.025	1.020	1.02E+00	3.71E-01	8.47E-02
PM-10 (total)	0.0087	0.355	3.55E-01	1.29E-01	2.95E-02
PM-2.5	1.30E-04	0.005	5.30E-03	1.93E-03	4.40E-04

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

Aggregate transfer from conveyor to drum dryer (1 transfer point): **408 T/hr**

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (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)	3.31E-03	1.35E-01	1.35E-01	4.90E-02	1.12E-02
PM-10 (total)	1.56E-03	6.38E-02	6.38E-02	2.32E-02	5.30E-03
PM-2.5	2.37E-04	9.66E-03	9.66E-03	3.51E-03	8.02E-04

Facility: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Asphalt Tank Heater - #2 Oil Fired, Estimated GHG Emissions Using AP-42 Sections 11.1 (HMA Plants) & 1.3 (Fuel Oil Combustion)

Hot Mix Plant Fuel Type Toggle (#2) =	1
Hot Mix Plant Fuel Type Toggle (Used Oil) =	1
Hot Mix Plant Fuel Type Toggle (NG) =	1
Hot Mix Plant Fuel Type Toggle (LPG) =	1
Tank Heater Fuel Type Toggle (NG) =	1
Tank Heater Fuel Type Toggle (#2) =	1

Note: CO2e emissions from the silo, loadout operation, and the tanks were assumed to be negligible (less than 1 ton per year).

Green House Gas Emissions When Combusting #2 Fuel Oil

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	5,100.00	1.00	5,100.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.85	21.00	38.95
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	0.066926	310.00	20.75

Tank Heater	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e T/yr
CO_2	Assumes all carbon is converted to CO_2			814.95	1	814.95
Methane	0.216	lb/10^3 gal	AP-42 Table 1.3-3	6.67E-03	21	0.14
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	5.84E+00	310	1809.49

Green House Gas Emissions When Combusting Used Oil

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	5,100.00	1.00	5,100.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.85	21.00	38.95
N_2O	0.53	lb/10^3 gal	AP-42 Table 1.3-8	0.136427	310.00	42.29

Green House Gas Emissions When Combusting Natural Gas

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	5,100.00	1.00	5,100.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.85	21.00	38.95
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	0.066926	310.00	20.75

Tank Heater	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e T/yr
CO_2	0.12	lb/scf	AP-42 Table 1.4-2	497.65	1	497.65
Methane	0.0000023	lb/scf	AP-42 Table 1.4-2	9.54E-03	21	0.20
N_2O	0.0000022	lb/scf	AP-42 Table 1.4-2	9.12E-03	310	2.83

Green House Gas Emissions When Combusting LPG

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	5,100.00	1.00	5,100.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.85	21.00	38.95
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	0.066926	310.00	20.75

Green House Gas Emissions When Combusting Diesel Fuel

IC Engine 1 < 600 bhp	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	1.16	lb/bhp-hr	AP-42 Table 3.4-1	69.60	1.00	69.60

IC Engine 2 > 600 bhp	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	1.16	lb/bhp-hr	AP-42 Table 3.4-1	501.96	1.00	501.96

Total Green House Gas Emissions

Total Emissions	CO_2e (T/yr)
CO_2	6,486.51
Methane	39.15
N_2O	1,851.79
Grand Total	**8,377.44**

Facility: Facility Name
2/16/2016 14:58 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

EMISSION INVENTORY

POUNDS PER HOUR

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

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 10,200 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: 2.1150 MMBtu/hr 4,000 Hours/year 24 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. IC Engine 1: 8.43 gal/hour 727.272941 Hours/year IC Engine < 600hp #2 Fuel Oil 24 hrs/day
C2. IC Engine 2: 60.79 gal/hour 727.272941 Hours/year IC Engine > 600hp #2 Fuel Oil 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)	C IC Engine 1 + IC Engine 2 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)	14.03	5.09E-02	1.19E+00	4.71E-01	15.74
PM-10 (total)	9.78	3.55E-02	1.44E+00	4.71E-01	11.72
PM-2.5	9.48	2.38E-02	5.44E-01	4.71E-01	10.52
CO	55.25	1.74E-01	8.18E+00	1.07E+00	64.68
NOx	23.38	3.70E-01	3.17E+01		55.49
SO_2	56.74	1.10E+00	1.36E-02		57.85
VOC	13.60	1.14E-02	1.17E+00	1.71E+00	16.49
Lead	6.38E-03	2.33E-05	0.00E+00		6.40E-03
HCl [e]	8.93E-02	0.00E+00	0.00E+00		8.93E-02
Dioxins[e]					
2,3,7,8-TCDD	7.41E-12				7.41E-12
Total TCDD	3.28E-11				3.28E-11
1,2,3,7,8-PeCDD	1.09E-11				1.09E-11
Total PeCDD	7.76E-10				7.76E-10
1,2,3,4,7,8-HxCDD	1.48E-11	4.86E-12			1.97E-11
1,2,3,6,7,8-HxCDD	4.59E-11				4.59E-11
1,2,3,7,8,9-HxCDD	3.46E-11	5.36E-12			3.99E-11
Total HxCDD	4.23E-10				4.23E-10
1,2,3,4,6,7,8-Hp-CDD	1.69E-10	1.06E-10			2.75E-10
Total HpCDD	6.70E-10	1.41E-10			8.11E-10
Octa CDD	8.82E-10	1.13E-09			2.01E-09
Total PCDD[h]	2.79E-09	1.41E-09			4.20E-09
Furans[e]					
2,3,7,8-TCDF	3.42E-11				3.42E-11
Total TCDF	1.31E-10	2.33E-11			1.54E-10
1,2,3,7,8-PeCDF	1.52E-10				1.52E-10
2,3,4,7,8-PeCDF	2.96E-11				2.96E-11
Total PeCDF	2.96E-09	3.38E-12			2.97E-09
1,2,3,4,7,8-HxCDF	1.41E-10				1.41E-10
1,2,3,6,7,8-HxCDF	4.23E-11				4.23E-11
2,3,4,6,7,8-HxCDF	6.70E-11				6.70E-11
1,2,3,7,8,9-HxCDF	2.96E-10				2.96E-10
Total HxCDF	4.59E-10	1.41E-11			4.73E-10
1,2,3,4,6,7,8-HpCDF	2.29E-10				2.29E-10
1,2,3,4,7,8,9-HpCDF	9.53E-11				9.53E-11
Total HpCDF	3.53E-10	6.84E-11			4.21E-10
Octa CDF	1.69E-10	8.46E-11			2.54E-10
Total PCDF[h]	1.41E-09	2.18E-10			1.63E-09
Total PCDD/PCDF[h]	4.23E-09	1.62E-09	0.00E+00		5.86E-09
Non-PAH HAPs					
Acetaldehyde*	4.59E-02		9.10E-05		4.60E-02
Acrolein[e]	1.11E-02		1.72E-04		1.12E-02
Benzene[e]	1.38E-02	1.99E-06	6.26E-04	2.14E-04	1.46E-02
1,3-Butadiene[e]			3.75E-06		3.75E-06
Ethylbenzene[e]	1.02E-01			6.92E-03	1.09E-01
Formaldehyde[e]	1.09E-01	7.10E-05	1.68E-04	3.10E-03	1.13E-01
Hexane[e]	3.91E-01	3.73E-03		7.83E-03	4.03E-01
Isooctane	1.70E-02			4.79E-05	1.70E-02
Methyl Ethyl Ketone[e]	8.50E-03			2.89E-03	1.14E-02
Pentane[e]		5.39E-03			5.39E-03
Propionaldehyde[e]	5.53E-02				5.53E-02
Quinone[e]	6.80E-02				6.80E-02
Methyl chloroform[e]	2.04E-02				2.04E-02
Toluene[e]	1.23E+00	7.05E-06	2.81E-03	6.92E-03	1.24E+00
Xylene[e]	8.50E-02		1.94E-03	3.47E-02	1.22E-01
POM (7-PAH Group)[e]	1.93E-05	7.14E-07	3.44E-06	4.01E-05	6.35E-05
TOTAL PAH HAPs	3.12E-02	1.63E-04	1.62E-04	1.74E-03	3.33E-02

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C IC Engine IC1 + IC2 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)
PAH HAPs					
2-Methylnaphthalene	6.00E-03	2.27E-08		7.58E-04	6.76E-03
3-Methylchloranthrene[e]	0.00E+00	1.70E-09			1.70E-09
Acenaphthene	4.94E-05	3.74E-06	3.37E-06	7.34E-05	1.30E-04
Acenaphthylene	7.76E-04	1.41E-06	6.87E-06	4.62E-06	7.89E-04
Anthracene	1.09E-04	1.27E-06	1.03E-06	2.01E-05	1.32E-04
Benzo(a)anthracene*	7.41E-06	1.70E-09	5.91E-07	7.30E-06	1.53E-05
Benzo(a)pyrene[e]	3.46E-07	1.14E-09	1.96E-07	2.77E-07	8.19E-07
Benzo(b)fluoranthene*	3.53E-06	7.05E-07	7.77E-07	9.14E-07	5.92E-06
Benzo(e)pyrene	3.88E-06	0.00E+00		1.79E-06	5.67E-06
Benzo(g,h,I)perylene	1.41E-06	1.14E-09	4.31E-07	2.29E-07	2.07E-06
Benzo(k)fluoranthene*	1.45E-06	1.70E-09	1.66E-07	2.65E-07	1.88E-06
Chrysene*	6.35E-06	1.70E-09	1.09E-06	3.12E-05	3.86E-05
Dibenzo(a,h)anthracene*	0.00E+00	1.14E-09	2.95E-07	4.45E-08	3.41E-07
Dichlorobenzene	0.00E+00	1.14E-06			1.14E-06
Fluoranthene	2.15E-05	3.10E-07	3.52E-06	1.95E-05	4.48E-05
Fluorene	3.88E-04	2.26E-07	1.17E-05	1.83E-04	5.83E-04
Indeno(1,2,3-cd)pyrene*	2.47E-07	1.70E-09	3.22E-07	5.65E-08	6.28E-07
Naphthalene[e]	2.29E-02	1.20E-04	9.80E-05	3.13E-04	2.35E-02
Perylene	3.11E-07	0.00E+00		5.33E-06	5.64E-06
Phenanthrene	8.12E-04	3.45E-05	3.10E-05	2.59E-04	1.14E-03
Pyrene	1.06E-04	2.26E-07	3.02E-06	5.75E-05	1.67E-04
Non-HAP Organic Compounds					
Acetone[e]	3.53E-01	0.00E+00		3.68E-03	3.56E-01
Benzaldehyde	4.68E-02	0.00E+00			4.68E-02
Butane	2.85E-01	4.35E-03			2.89E-01
Butyraldehyde	6.80E-02	0.00E+00			6.80E-02
Crotonaldehyde[e]	3.66E-02	0.00E+00			3.66E-02
Ethylene	2.98E+00	0.00E+00		6.95E-02	3.04E+00
Heptane	4.00E+00	0.00E+00			4.00E+00
Hexanal	4.68E-02	0.00E+00			4.68E-02
Isovaleraldehyde	1.36E-02	0.00E+00			1.36E-02
2-Methyl-1-pentene	1.70E+00	0.00E+00			1.70E+00
2-Methyl-2-butene	2.47E-01	0.00E+00			2.47E-01
3-Methylpentane	8.08E-02	0.00E+00			8.08E-02
1-Pentene	9.35E-01	0.00E+00			9.35E-01
n-Pentane	8.93E-02	0.00E+00			8.93E-02
Valeraldehyde*	2.85E-02	0.00E+00			2.85E-02
Metals					
Antimony[e]	7.65E-05	8.10E-05			1.58E-04
Arsenic[e]	1.98E-05	9.30E-06			2.91E-05
Barium[e]	2.47E-03	3.97E-05			2.50E-03
Beryllium[e]	0.00E+00	1.96E-07			1.96E-07
Cadmium[e]	1.45E-05	2.81E-06			1.73E-05
Chromium[e]	2.34E-03	1.30E-05			2.35E-03
Cobalt[e]	1.11E-05	9.29E-05			1.04E-04
Copper[e]	1.32E-03	2.72E-05			1.34E-03
Hexavalent Chromium[e]	1.59E-05	1.75E-06			1.76E-05
Manganese[e]	3.27E-03	4.63E-05			3.32E-03
Mercury[e]	1.11E-03	1.74E-06			1.11E-03
Molybdenum[e]	0.00E+00	1.21E-05			1.21E-05
Nickel[e]	2.22E-03	5.96E-04			2.82E-03
Phosphorus[e]	1.19E-02	1.46E-04			1.20E-02
Silver[e]	2.04E-04	0.00E+00			2.04E-04
Selenium[e]	1.49E-04	1.05E-05			1.59E-04
Thallium[e]	1.74E-06	0.00E+00			1.74E-06
Vanadium[e]	0.00E+00	4.91E-04			4.91E-04
Zinc[e]	2.59E-02	4.49E-04			2.64E-02

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

Facility: Facility Name
2/16/2016 14:58 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

EMISSION INVENTORY
POUNDS PER HOUR

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

A. Drum Mix Plant: **425** Tons/hour 727 Hours/year **309,091** Tons/year HMA throughput **10,200** hrs/day
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: **2.1150** MMBtu/hr **4,000** Hours/year **24** hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Natural Gas
C1. IC Engine 1: **8.43** gal/hour **727.2729412** Hours/year #2 Fuel Oil Generator < 600hp **24** hrs/day
C2. IC Engine 2: **60.79** gal/hour **727.2729412** Hours/year #2 Fuel Oil Generator > 600hp **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)	C IC 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[g]					
Bromomethane[e]				4.23E-04	4.23E-04
2-Butanone (see Methyl Ethyl Ketone)					
Carbon disulfide[e]				1.06E-03	1.06E-03
Chloroethane (Ethyl chloride[e])				2.11E-04	2.11E-04
Chloromethane (Methyl chloride[e])				1.46E-03	1.46E-03
Cumene				1.94E-03	1.94E-03
n-Hexane					
Methylene chloride (Dichloromethane[e])				1.40E-05	1.40E-05
MTBE					
Styrene[e]				4.09E-04	4.09E-04
Tetrachloroethene (Tetrachloroethylene[e])				1.36E-04	1.36E-04
1,1,1-Trichloroethane (Methyl chloroform[e])					
Trichloroethene (Trichloroethylene[e])					
Trichlorofluoromethane				2.30E-05	2.30E-05
m-/p-Xylene[e]				1.76E-02	1.76E-02
o-Xylene[e]				1.71E-02	1.71E-02
Phenol[e,f]				1.71E-03	1.71E-03
Non-HAP Organic Compounds					
Methane				1.46E+00	1.46E+00

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: **Facility Name**
2/16/2016 14:58 **Permit/Facility ID:** **P-20XX.XXXX** **XXX-XXXXX**

EMISSION INVENTORY

TONS PER YEAR

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

A. Drum Mix Plant: **425** Tons/hour **727** Hours/year **309,091** Tons/year HMA throughput **10,200** 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 LPG/Propane
B. Tank Heater: **2.1150** MMBtu/hr **4,000** Hours/year **24** 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. IC Engine 1: **8.43** gal/hour **727.272941** Hours/year IC Engine <600hp #2 Fuel Oil **24** hrs/day
C2. IC Engine 2: **60.79** gal/hour **727.272941** Hours/year IC Engine > 600hp #2 Fuel Oil **24** 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 IC Engine IC1 + IC2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling, Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	5.10	1.02E-01	4.33E-01	1.71E-01	5.63
PM-10 (total)	3.55	7.10E-02	5.24E-01	1.71E-01	4.15
PM-2.5	3.45	4.75E-02	1.98E-01	1.71E-01	3.69
CO	20.09	3.48E-01	2.97E+00	3.91E-01	23.41
NOx	8.50	7.41E-01	1.15E+01		20.79
SO_2	20.63	2.19E+00	4.59E-03		22.83
VOC	4.95	2.28E-02	4.24E-01	6.23E-01	5.39
Lead	2.32E-03	4.66E-05	0.00E+00		2.36E-03
HCl [e]	3.25E-02	0.00E+00	0.00E+00		3.25E-02
Dioxins[e]					
2,3,7,8-TCDD	3.25E-11				3.25E-11
Total TCDD	1.44E-10				1.44E-10
1,2,3,7,8-PeCDD	4.79E-11				4.79E-11
Total PeCDD	3.40E-09				3.40E-09
1,2,3,4,7,8-HxCDD	6.49E-11	2.13E-11			8.62E-11
1,2,3,6,7,8-HxCDD	2.01E-10				2.01E-10
1,2,3,7,8,9-HxCDD	1.51E-10	2.35E-11			1.75E-10
Total HxCDD	1.85E-09				1.85E-09
1,2,3,4,6,7,8-Hp-CDD	7.42E-10	4.63E-10			1.20E-09
Total HpCDD	2.94E-09	6.17E-10			3.55E-09
Octa CDD	3.86E-09	4.94E-09			8.80E-09
Total PCDD[h]	1.22E-08	6.17E-09			1.84E-08
Furans[e]					
2,3,7,8-TCDF	1.50E-10				1.50E-10
Total TCDF	5.72E-10	1.02E-10			6.74E-10
1,2,3,7,8-PeCDF	6.65E-10				6.65E-10
2,3,4,7,8-PeCDF	1.30E-10				1.30E-10
Total PeCDF	1.30E-08	1.48E-11			1.30E-08
1,2,3,4,7,8-HxCDF	6.18E-10				6.18E-10
1,2,3,6,7,8-HxCDF	1.85E-10				1.85E-10
2,3,4,6,7,8-HxCDF	2.94E-10				2.94E-10
1,2,3,7,8,9-HxCDF	1.30E-09				1.30E-09
Total HxCDF	2.01E-09	6.17E-11			2.07E-09
1,2,3,4,6,7,8-HpCDF	1.00E-09				1.00E-09
1,2,3,4,7,8,9-HpCDF	4.17E-10				4.17E-10
Total HpCDF	1.55E-09	2.99E-10			1.84E-09
Octa CDF	7.42E-10	3.70E-10			1.11E-09
Total PCDF[h]	6.18E-09	9.57E-10			7.14E-09
Total PCDD/PCDF[h]	1.85E-08	7.10E-09			2.56E-08
Non-PAH HAPs					
Acetaldehyde[e]	2.01E-01		3.98E-04		2.01E-01
Acrolein[e]	4.02E-03		6.27E-05		4.08E-03
Benzene[e]	6.03E-02	8.71E-06	2.74E-03	9.37E-04	6.30E-02
1,3-Butadiene[e]	0.00E+00		1.64E-05		1.64E-05
Ethylbenzene[e]	3.71E-02			2.52E-03	3.71E-02
Formaldehyde[e]	4.79E-01	3.11E-04	7.35E-04	1.36E-02	4.80E-01
Hexane[e]	1.42E-01	7.46E-03		2.85E-03	1.50E-01
Isooctane	6.18E-03			1.74E-05	6.18E-03
Methyl Ethyl Ketone[e]	3.09E-03			1.05E-03	3.09E-03
Pentane[e]	0.00E+00	1.08E-02			1.08E-02
Propionaldehyde[e]	2.01E-02				2.01E-02
Quinone[e]	2.47E-02				2.47E-02
Methyl chloroform[e]	7.42E-03				7.42E-03
Toluene[e]	4.48E-01	1.41E-05	1.02E-03	2.52E-03	4.49E-01
Xylene[e]	3.09E-02	0.00E+00	7.04E-04	1.26E-02	3.16E-02
TOTAL Federal HAPs (T/yr)=					**1.69E+00**

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (T/yr)	C IC Engine IC1 + IC2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PAH HAPs					
2-Methylnaphthalene	2.63E-02	9.95E-08		3.32E-03	2.63E-02
3-Methylchloranthrene[e]	0.00E+00	7.46E-09			7.46E-09
Acenaphthene	2.16E-04	1.64E-05	1.48E-05	3.21E-04	2.47E-04
Acenaphthylene	3.40E-03	6.17E-06	3.01E-05	2.02E-05	3.44E-03
Anthracene	4.79E-04	5.56E-06	4.51E-06	8.79E-05	4.89E-04
Benzo(a)anthracene[e]	3.25E-05	7.46E-09	2.59E-06	3.20E-05	3.51E-05
Benzo(a)pyrene[e]	1.51E-06	4.98E-09	8.57E-07	1.21E-06	2.38E-06
Benzo(b)fluoranthene[e]	1.55E-05	3.09E-06	3.40E-06	4.00E-06	2.19E-05
Benzo(e)pyrene	1.70E-05	0.00E+00		7.84E-06	1.70E-05
Benzo(g,h,I)perylene	6.18E-06	4.98E-09	1.89E-06	1.00E-06	8.08E-06
Benzo(k)fluoranthene[e]	6.34E-06	7.46E-09	7.25E-07	1.16E-06	7.07E-06
Chrysene[e]	2.78E-05	7.46E-09	4.78E-06	1.37E-04	3.26E-05
Dibenzo(a,h)anthracene[e]	0.00E+00	4.98E-09	1.29E-06	1.95E-07	1.30E-06
Dichlorobenzene	0.00E+00	4.98E-06			4.98E-06
Fluoranthene	9.43E-05	1.36E-06	1.54E-05	8.52E-05	1.11E-04
Fluorene	1.70E-03	9.88E-07	5.10E-05	8.02E-04	1.75E-03
Indeno(1,2,3-cd)pyrene[e]	1.08E-06	7.46E-09	1.41E-06	2.48E-07	2.50E-06
Naphthalene[e]	1.00E-01	5.25E-04	4.29E-04	1.37E-03	1.01E-01
Perylene	1.36E-06	0.00E+00		2.34E-05	1.36E-06
Phenanthrene	3.55E-03	1.51E-04	1.36E-04	1.13E-03	3.84E-03
Pyrene	4.64E-04	9.88E-07	1.32E-05	2.52E-04	4.78E-04
Non-HAP Organic Compounds					
Acetone[e]	1.28E-01	0.00E+00		1.34E-03	1.28E-01
Benzaldehyde	1.70E-02	0.00E+00			1.70E-02
Butane	1.04E-01	8.71E-03			1.12E-01
Butyraldehyde	2.47E-02	0.00E+00			2.47E-02
Crotonaldehyde[e]	1.33E-02	0.00E+00			1.33E-02
Ethylene	1.08E+00	0.00E+00		2.53E-02	1.08E+00
Heptane	1.45E+00	0.00E+00			1.45E+00
Hexanal	1.70E-02	0.00E+00			1.70E-02
Isovaleraldehyde	4.95E-03	0.00E+00			4.95E-03
2-Methyl-1-pentene	6.18E-01	0.00E+00			6.18E-01
2-Methyl-2-butene	8.96E-02	0.00E+00			8.96E-02
3-Methylpentane	2.94E-02	0.00E+00			2.94E-02
1-Pentene	3.40E-01	0.00E+00			3.40E-01
n-Pentane[e]	3.25E-02	0.00E+00			3.25E-02
Valeraldehyde[e]	1.04E-02	0.00E+00			1.04E-02
Metals					
Antimony[e]	2.78E-05	1.62E-04			1.90E-04
Arsenic[e]	8.65E-05	4.07E-05			1.27E-04
Barium[e]	8.96E-04	7.93E-05			9.76E-04
Beryllium[e]	0.00E+00	8.58E-07			8.58E-07
Cadmium[e]	6.34E-05	1.23E-05			7.56E-05
Chromium[e]	8.50E-04	2.61E-05			8.76E-04
Cobalt[e]	4.02E-06	1.86E-04			1.90E-04
Copper[e]	4.79E-04	5.43E-05			5.33E-04
Hexavalent Chromium[e]	6.95E-05	7.66E-06			7.72E-05
Manganese[e]	1.19E-03	9.26E-05			1.28E-03
Mercury[e]	4.02E-04	3.49E-06			4.05E-04
Molybdenum[e]	0.00E+00	2.43E-05			2.43E-05
Nickel[e]	9.74E-03	2.61E-03			1.23E-02
Phosphorus[e]	4.33E-03	2.92E-04			4.62E-03
Silver[e]	7.42E-05	0.00E+00			7.42E-05
Selenium[e]	5.41E-05	2.11E-05			7.52E-05
Thallium[e]	6.34E-07				6.34E-07
Vanadium[e]	0.00E+00	9.82E-04			9.82E-04
Zinc[e]	9.43E-03	8.98E-04			1.03E-02

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

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 10,200 Tons/day
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: 2.1150 MMBtu/hr 4,000 Hours/year 24 hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Natural Gas
C1. Generator G1: 8.43 gal/hour 727.2729412 Hours/year #2 Fuel Oil IC Engine <600hp 24 hrs/day
C2. Generator G2: 60.79 gal/hour 727.2729412 Hours/year #2 Fuel Oil IC Engine > 600hp 24 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 Generator Max Emission Rate for Pollutant (T/yr)	D Load-out, Silo Filling, & Tank Storage Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
non-PAH HAPs[a]					
Bromomethane[e]				1.54E-04	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)					0.00E+00
Carbon disulfide[e]				3.85E-04	0.00E+00
Chloroethane (Ethyl chloride[e])				7.67E-05	0.00E+00
Chloromethane (Methyl chloride[e])				5.30E-04	0.00E+00
Cumene				7.07E-04	0.00E+00
n-Hexane				0.00E+00	0.00E+00
Methylene chloride (Dichloromethane[e])				5.09E-06	0.00E+00
MTBE					0.00E+00
Styrene[e]				1.49E-04	0.00E+00
Tetrachloroethene (Tetrachloroethylene[e])				4.95E-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				8.36E-06	0.00E+00
m-/p-Xylene[e]				6.40E-03	0.00E+00
o-Xylene[e]				6.22E-03	0.00E+00
Phenol[e,f]				6.22E-04	0.00E+00
Non-HAP Organic Compounds					
Methane				5.31E-01	0.00E+00

e) IDAPA Toxic Air Pollutant

Facility: Facility Name

2/16/2016 14:58 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

CRITERIA POLLUTANT MODELING

POUNDS PER HOUR - POINT AND PSEUDO-STACK SOURCES

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

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 10,200 Tons/day 24. hr/day 727 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	0.7500% S	24 hrs/day	

B. Tank Heater: 2.1150 MMBtu Rate 4,000 Hours/year

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

0.5000% S	#2 Fuel Oil	Natural Gas
0.0015% S	#2 Fuel Oil	24 hrs/day
0.0015% S	#2 Fuel Oil	24 hrs/day

C1. IC Engine 1: 8.43 gal/hour 727.2729412 Hours/year IC Engine < 600hp

C2. IC Engine 2: 60.79 gal/hour 727.2729412 Hours/year IC Engine > 600hp

Max 1-hour, 3-hour, and 8-hour averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 IC2 > 600 bhp Generator 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)	9.78	3.55E-02	3.58E-01	1.08E+00	2.49E-01	2.22E-01	
PM-2.5	9.48	2.38E-02	8.09E-02	4.63E-01	2.49E-01	2.22E-01	
CO	55.25	1.74E-01	1.10E+00	7.08E+00	5.01E-01	5.73E-01	
NOx	23.38	3.70E-01	5.09E+00	2.67E+01			
SO_2	56.74	1.10E+00	1.00E-03	1.26E-02			
VOC	13.60	1.14E-02	4.16E-01	7.50E-01	5.18E-02	1.66E+00	
Lead	6.38E-03	2.33E-05					

Max 24-hour averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 G1 < 600 hp Generator Max Emission Rate for Pollutant (lb/hr)	C2 G2 > 600hp Generator 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)	9.78	3.55E-02	3.58E-01	1.08E+00	2.49E-01	2.22E-01	
PM-2.5	9.48	2.38E-02	8.09E-02	0.463148	2.49E-01	2.22E-01	
CO							
NOx							
SO_2	56.74	1.10E+00	1.00E-03	1.26E-02			
VOC							
Lead							

Max Annual averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 G1< 600 hp Generator Max Emission Rate for Pollutant (lb/hr)	C2 G2 > 600hp Generator 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)	0.81	1.62E-02	2.97E-02	8.99E-02	2.07E-02	1.84E-02	
PM-2.5	0.79	1.09E-02					
CO							
NOx	1.94	1.69E-01	0.42	2.21			
SO_2	4.71	0.50	8.34E-05	0.00			
VOC							
Lead							

Facility: Facility Name

2/16/2016 14:58 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

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, Silo Fill/Load-out - Generator not included

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 10,200 Tons/day

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

B. Tank Heater: 2.1150 MMBtu Rated 4,000 Hours/year

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

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

Short Term Source Factor 586 ELs? 1

C1. IC Engine G1: 8.43 gal/hour 727.2729412 Hours/year IC Engine <600hp #2 Fuel Oil 24 hrs/day

C2. IC Engine G2: 60.79 gal/hour 727.2729412 Hours/year IC Engine > 600hp #2 Fuel Oil 24 hrs/day

Pollutant	TOTAL of Max Emission Rates from A, B, & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled? Meets AAC or AACC?
HCl[e]	0.089	0.05	Exceeds	
Dioxins		Toxic Equivalency Factor[c]	Adjusted Emission Rate (lb/hr)	
2,3,7,8-TCDD	7.41E-12	1.0	7.41E-12	
Total TCDD	3.28E-11	n/a		
1,2,3,7,8-PeCDD	1.09E-11	1.0	1.09E-11	
Total PeCDD	7.76E-10	n/a		
1,2,3,4,7,8-HxCDD	1.97E-11	0.1	1.97E-12	
1,2,3,6,7,8-HxCDD	4.59E-11	0.1	4.59E-12	
1,2,3,7,8,9-HxCDD	3.99E-11	0.1	3.99E-12	
Total HxCDD	4.23E-10	n/a		
1,2,3,4,6,7,8-Hp-CDD	2.75E-10	0.01	2.75E-12	
Total HpCDD	8.11E-10	n/a		
Octa CDD	2.01E-09	0.0003	6.03E-13	
Total PCDD	4.20E-09	n/a		
Furans				
2,3,7,8-TCDF	3.42E-11	0.1	3.42E-12	
Total TCDF	1.54E-10	n/a		
1,2,3,7,8-PeCDF	1.52E-10	0.03	4.55E-12	
2,3,4,7,8-PeCDF	2.96E-11	0.3	8.89E-12	
Total PeCDF	2.97E-09	n/a		
1,2,3,4,7,8-HxCDF	1.41E-10	0.1	1.41E-11	
1,2,3,6,7,8-HxCDF	4.23E-11	0.1	4.23E-12	
2,3,4,6,7,8-HxCDF	6.70E-11	0.1	6.70E-12	
1,2,3,7,8,9-HxCDF	2.96E-10	0.1	2.96E-11	
Total HxCDF	4.73E-10	n/a		
1,2,3,4,6,7,8-HpCDF	2.29E-10	0.01	2.29E-12	
1,2,3,4,7,8,9-HpCDF	9.53E-11	0.01	9.53E-13	
Total HpCDF	4.21E-10	n/a		
Octa CDF	2.54E-10	0.0003	7.62E-14	
Total PCDF	1.63E-09	n/a		
Total PCDD/PCDF	5.86E-09	n/a		
TOTAL	Adjusted lb/hr	TAPs EL for 2,3,7,8 TCDD	Exceeds TAPs EL?	Modeled?
Dioxin/Furans[c]	1.07E-10	1.50E-10	No	
Non-PAH HAPs				
Acetaldehyde	4.59E-02	3.00E-03	Exceeds	
Acrolein	1.11E-02	0.017	No	
Benzene	1.40E-02	8.00E-04	Exceeds	
1,3-Butadiene				
Ethylbenzene	1.09E-01	29	No	
Formaldehyde	1.13E-01	5.10E-04	Exceeds	
Hexane	4.03E-01	12	No	
Isooctane	1.70E-02			
Methyl Ethyl Ketone	1.14E-02	39.3	No	
Pentane	5.39E-03	118	No	
Propionaldehyde	5.53E-02	0.0287	Exceeds	
Quinone	6.80E-02	0.027	Exceeds	
Methyl chloroform	2.04E-02	127	No	
Toluene	1.24E+00	25	No	
Xylene	1.20E-01	29	No	

Pollutant	TOTAL of Max Emission Rates from A, B, & 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	6.76E-03	9.10E-05	Exceeds	
3-Methylchloranthrene	1.70E-09	2.50E-06	No	
Acenaphthene	1.27E-04	9.10E-05	Exceeds	
Acenaphthylene	7.82E-04	9.10E-05	Exceeds	
Anthracene	1.31E-04	9.10E-05	Exceeds	
Benzo(a)anthracene	1.47E-05			see POM
Benzo(a)pyrene	6.24E-07	2.00E-06	No	see POM
Benzo(b)fluoranthene	5.15E-06			see POM
Benzo(e)pyrene	5.67E-06	9.10E-05	No	
Benzo(g,h,I)perylene	1.64E-06	9.10E-05	No	
Benzo(k)fluoranthene	1.71E-06			see POM
Chrysene	3.76E-05			see POM
Dibenzo(a,h)anthracene	4.56E-08			see POM
Dichlorobenzene	1.14E-06	9.10E-05	No	
Fluoranthene	4.13E-05	9.10E-05	No	
Fluorene	5.71E-04	9.10E-05	Exceeds	
Indeno(1,2,3-cd)pyrene	3.05E-07			see POM
Naphthalene[e]	2.34E-02	9.10E-05	Exceeds	
Perylene	5.64E-06	9.10E-05	No	
Phenanthrene	1.10E-03	9.10E-05	Exceeds	
Pyrene	1.64E-04	9.10E-05	Exceeds	
PolycyclicOrganicMatter[d]	6.01E-05	2.00E-06	Exceeds	
Non-HAP Organic Compounds				
Acetone	3.56E-01	119	No	
Benzaldehyde	4.68E-02			
Butane	2.89E-01			
Butyraldehyde	6.80E-02			
Crotonaldehyde	3.66E-02	0.38	No	
Ethylene	3.04E+00			
Heptane	4.00E+00	109	No	
Hexanal	4.68E-02			
Isovaleraldehyde	1.36E-02			
2-Methyl-1-pentene	1.70E+00			
2-Methyl-2-butene	2.47E-01			
3-Methylpentane	8.08E-02			
1-Pentene	9.35E-01			
n-Pentane[e]	8.93E-02	118	No	
Valeraldehyde (n-Valeraldehyde)	2.85E-02	11.7	No	
Metals				
Antimony[e]	1.58E-04	0.033	No	
Arsenic	2.91E-05	1.50E-06	Exceeds	
Barium	2.50E-03	0.033	No	
Beryllium	1.96E-07	2.80E-05	No	
Cadmium	1.73E-05	3.70E-06	Exceeds	
Chromium	2.35E-03	0.033	No	
Cobalt	1.04E-04	0.0033	No	
Copper	1.34E-03	0.013	No	
Hexavalent Chromium	1.76E-05	5.60E-07	Exceeds	
Manganese	3.32E-03	0.067	No	
Mercury	1.11E-03	0.003	No	
Molybdenum	1.21E-05	0.333	No	
Nickel	2.82E-03	2.70E-05	Exceeds	
Phosphorus	1.20E-02	0.007	Exceeds	
Silver	2.04E-04	0.007	No	
Selenium	1.59E-04	0.013	No	
Thallium	1.74E-06	0.007	No	
Vanadium	4.91E-04	0.003	No	
Zinc	2.64E-02	0.667	No	

a) Reserved.

b) Toxic Air Pollutants, IDAPA 58.01.01.585 and .586, levels in effect as of February 25, 2009

c) 2005, Van den Berg, et al, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds, *Toxicological Sciences* 93(2), 223-241 (2006). Accessible at http://toxsci.oxfordjournals.org/cgi/reprint/93/2/223.
Use of the 2005 WHO toxic equivalency factors (TEFs) is consistent with current EPA recommendations for TRI reporting (72 FR 26544, May 10, 2007)
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 highlighted PAHs h shall be considered together as one TAP equivalent in potency to benzo(a)pyrene.

e) Naphthalene is listed as a noncarcinogenic TAP in IDAPA 58.01.01.585 (EL = 3.33 lb/hr), but must also be considered as a carcinogenic PAH (EL = 9.10E-05 lb/hr)

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: Facility Name

2/16/2016 14:58 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

TAPs EL Screen - ALL SOURCES

Max Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Silo Fill/Load-out - Generator not included

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 10,200 Tons/day

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

B. Tank Heater: 2.1150 MMBtu Rated 4,000 Hours/year

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

C1. IC Engine G1: 8.43 gal/hour 727.2729412 Hours/year #2 Fuel Oil 24 hrs/day

C2. IC Engine G2: 60.79 gal/hour 727.2729412 Hours/year #2 Fuel Oil 24 hrs/day

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

Pollutant	TOTAL of Max Emission Rates from A, B, & 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])	4.23E-04	1.27	No	
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	1.06E-03	2	No	
Chloroethane (Ethyl chloride[e])	2.11E-04	176	No	
Chloromethane (Methyl chloride[e])	1.46E-03	6.867	No	
Cumene[e]	1.94E-03	16.3	No	
n-Hexane[e] (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	1.40E-05	1.60E-03	No	
MTBE	0.00E+00			
Styrene[e]	4.09E-04	6.67	No	
Tetrachloroethene (Tetrachloroethylene[e])	1.36E-04	1.30E-02	No	
1,1,1-Trichloroethane (see Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])	0.00E+00	17.93	No	
Trichlorofluoromethane	2.30E-05			
m-/p-Xylene[e] (added into Xylene[e])				
o-Xylene[e] (added into Xylene[e])				
Phenol[e,f]	1.71E-03	1.27	No	
Non-HAP Organic Compounds				
Methane	1.46E+00			

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: Facility Name

2/16/2016 14:58 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

TAPs MODELING

POUNDS PER HOUR - POINT AND PSEUDO-STACK SOURCES

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

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 10,200 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: 2.1150 MMBtu Rated 4,000 Hours/year 24 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. IC Engine: 8.43 gal/hour 727.2729412 Hours/year IC Engine < 600hp #2 Fuel Oil 24 hrs/day

C2. IC Engine: 60.79 gal/hour 727.2729412 Hours/year IC Engine > 600h #2 Fuel Oil 24 hrs/day

Pollutant	A Drum Dryer Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 * see note IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 * see note IC2 > 600 bhp Generator 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)						
PM-2.5						
CO						
NOx						
SO_2						
VOC						
Lead						
HCl [e]	8.93E-02	0.00E+00	0	0		
Dioxins[e]						
2,3,7,8-TCDD	7.41E-12		0	0		
Total TCDD	3.28E-11		0	0		
1,2,3,7,8-PeCDD	1.09E-11		0	0		
Total PeCDD	7.76E-10		0	0		
1,2,3,4,7,8-HxCDD	1.48E-11	4.86E-12	0	0		
1,2,3,6,7,8-HxCDD	4.59E-11		0	0		
1,2,3,7,8,9-HxCDD	3.46E-11	5.36E-12	0	0		
Total HxCDD	4.23E-10		0	0		
1,2,3,4,6,7,8-Hp-CDD	1.69E-10	1.06E-10	0	0		
Total HpCDD	6.70E-10	1.41E-10	0	0		
Octa CDD	8.82E-10	1.13E-09	0	0		
Total PCDD[h]	2.79E-09	1.41E-09	0	0		
Furans[e]						
2,3,7,8-TCDF	3.42E-11		0	0		
Total TCDF	1.31E-10	2.33E-11	0	0		
1,2,3,7,8-PeCDF	1.52E-10		0	0		
2,3,4,7,8-PeCDF	2.96E-11		0	0		
Total PeCDF	2.96E-09	3.38E-12	0	0		
1,2,3,4,7,8-HxCDF	1.41E-10		0	0		
1,2,3,6,7,8-HxCDF	4.23E-11		0	0		
2,3,4,6,7,8-HxCDF	6.70E-11		0	0		
1,2,3,7,8,9-HxCDF	2.96E-10		0	0		
Total HxCDF	4.59E-10	1.41E-11	0	0		
1,2,3,4,6,7,8-HpCDF	2.29E-10		0	0		
1,2,3,4,7,8,9-HpCDF	9.53E-11		0	0		
Total HpCDF	3.53E-10	6.84E-11	0	0		
Octa CDF	1.69E-10	8.46E-11	0	0		
Total PCDF[h]	1.41E-09	2.18E-10	0	0		
Total PCDD/PCDF[h]	4.23E-09	1.62E-09	0	0		
Non-PAH HAPs						
Acetaldehyde[e]	4.59E-02		0	0		
Acrolein[e]	1.11E-02		0	0		
Benzene[e]	**1.38E-02**	**1.99E-06**	0	0	**1.38E-04**	**7.63E-05**
1,3-Butadiene[e]			0	0		
Ethylbenzene[e]	1.02E-01		0	0	1.97E-03	4.95E-03
Formaldehyde[e]	**1.09E-01**	**7.10E-05**	0	0	**2.97E-03**	**1.29E-04**
Hexane[e]	3.91E-01	3.73E-03	0	0	5.18E-03	2.65E-03
Isooctane	1.70E-02		0	0	1.61E-05	3.18E-05
Methyl Ethyl Ketone[e]	8.50E-03		0	0	2.02E-03	8.66E-04
Pentane[e]		5.39E-03	0	0		
Propionaldehyde[e]	5.53E-02		0	0		
Quinone[e]	6.80E-02		0	0		
Methyl chloroform[e]	2.04E-02		0	0		
Toluene[e]	1.23E+00	7.05E-06	0	0	3.21E-03	3.71E-03
Xylene[e]	8.50E-02		0	0	1.33E-02	2.14E-02
POM (7-PAH Group)	1.93E-05	7.14E-07		0.00E+00	2.38E-05	1.62E-05

e) IDAPA Toxic Air Pollutant

Pollutant	A Drum Dryer Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 * see note IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 * see note IC2 > 600 bhp Generator 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	6.00E-03	2.27E-08	0	0	4.72E-04	2.86E-04
3-Methylchloranthrene[e]	0.00E+00	1.70E-09	0	0		
Acenaphthene	4.94E-05	3.74E-06	0	0	4.21E-05	3.13E-05
Acenaphthylene	7.76E-04	1.41E-06	0	0	1.25E-06	3.37E-06
Anthracene	1.09E-04	1.27E-06	0	0	1.16E-05	8.42E-06
Benzo(a)anthracene[e]	7.41E-06	1.70E-09	0	0	5.02E-06	2.29E-06
Benzo(a)pyrene[e]	3.46E-07	1.14E-09	0	0	0.00E+00	2.77E-07
Benzo(b)fluoranthene[e]	3.53E-06	7.05E-07	0	0	0.00E+00	9.14E-07
Benzo(e)pyrene	3.88E-06	0.00E+00	0	0	8.51E-07	9.38E-07
Benzo(g,h,I)perylene	1.41E-06	1.14E-09	0	0	0.00E+00	2.29E-07
Benzo(k)fluoranthene[e]	1.45E-06	1.70E-09	0	0	0.00E+00	2.65E-07
Chrysene[e]	6.35E-06	1.70E-09	0	0	1.88E-05	1.24E-05
Dibenzo(a,h)anthracene[e]	0.00E+00	1.14E-09	0	0	0.00E+00	4.45E-08
Dichlorobenzene	0.00E+00	1.14E-06	0	0		
Fluoranthene	2.15E-05	3.10E-07	0	0	1.34E-05	6.01E-06
Fluorene	3.88E-04	2.26E-07	0	0	9.05E-05	9.26E-05
Indeno(1,2,3-cd)pyrene[e]	2.47E-07	1.70E-09	0	0	0.00E+00	5.65E-08
Naphthalene[e]	2.29E-02	1.20E-04	0	0	1.63E-04	1.50E-04
Perylene	3.11E-07	0.00E+00	0	0	2.69E-06	2.65E-06
Phenanthrene	8.12E-04	3.45E-05	0	0	1.61E-04	9.74E-05
Pyrene	1.06E-04	2.26E-07	0	0	3.94E-05	1.80E-05
Non-HAP Organic Compounds						
Acetone[e]	3.53E-01	0.00E+00	0	0	2.85E-03	8.27E-04
Benzaldehyde	4.68E-02	0.00E+00	0	0		
Butane	2.85E-01	4.35E-03	0	0		
Butyraldehyde	6.80E-02	0.00E+00	0	0		
Crotonaldehyde[e]	3.66E-02	0.00E+00	0	0		
Ethylene	2.98E+00	0.00E+00	0	0	5.70E-02	1.25E-02
Heptane	4.00E+00	0.00E+00	0	0		
Hexanal	4.68E-02	0.00E+00	0	0		
Isovaleraldehyde	1.36E-02	0.00E+00	0	0		
2-Methyl-1-pentene	1.70E+00	0.00E+00	0	0		
2-Methyl-2-butene	2.47E-01	0.00E+00	0	0		
3-Methylpentane	8.08E-02	0.00E+00	0	0		
1-Pentene	9.35E-01	0.00E+00	0	0		
n-Pentane	8.93E-02	0.00E+00	0	0		
Valeraldehyde[e]	2.85E-02	0.00E+00	0	0		
Metals						
Antimony[e]	7.65E-05	8.10E-05	0	0		
Arsenic[e]	1.98E-05	9.30E-06	0	0		
Barium[e]	2.47E-03	3.97E-05	0	0		
Beryllium[e]	0.00E+00	1.96E-07	0	0		
Cadmium[e]	1.45E-05	2.81E-06	0	0		
Chromium[e]	2.34E-03	1.30E-05	0	0		
Cobalt[e]	1.11E-05	9.29E-05	0	0		
Copper[e]	1.32E-03	2.72E-05	0	0		
Hexavalent Chromium[e]	1.59E-05	1.75E-06	0	0		
Manganese[e]	3.27E-03	4.63E-05	0	0		
Mercury[e]	1.11E-03	1.74E-06	0	0		
Molybdenum[e]	0.00E+00	1.21E-05	0	0		
Nickel[e]	2.22E-03	5.96E-04	0	0		
Phosphorus[e]	1.19E-02	1.46E-04	0	0		
Silver[e]	2.04E-04	0.00E+00	0	0		
Selenium[e]	1.49E-04	1.05E-05	0	0		
Thallium[e]	1.74E-06	0.00E+00	0	0		
Vanadium[e]	0.00E+00	4.91E-04	0	0		
Zinc[e]	2.59E-02	4.49E-04	0	0		

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

A.2 EI Spreadsheet for Duct Burner Emissions Only

Hot Mix Asphalt EI Spreadsheet

Idaho Department of Environmental Quality, Air Quality Division, Boise, Idaho Version 2/11/15

Information shown in bold blue on any worksheet indicates user input for that cell. Black or blue 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 collocated with only one rock crushing plant and no other sources of emissions within 1,000 feet.

User Input:

Facility Data Input worksheet: Input facility-specific data including contact information, equipment ratings, proposed HMA production levels, and tank heater and generator hours of operation. Select fuel types and generator 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 as this 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.

Asphalt Drum Mixer/Dryer with Fabric Filter (Baghouse), either counterflow or parallel flow, fired by the following fuels:

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

Asphaltic Oil Tank Heater, either fired by #2 fuel oil or natural gas

Note: For Facility Data Input., input "1" (use this fuel) or "0" (don't use this fuel).
Note: If line power is **ALWAYS** used to power the Asphaltic oil tank heater, input "0" for each fuel.
For distallate fuel oil the default is 0.5% sulfur content by weight. User input is required in "Facility Data Input" for any other sulfur content.
Note: The EI summary sheets will use the highest emission for any selected fuel for each pollutant.

For IC Engines Powering Electrical Generators (with a maximum of one small, less than 600 bhp, and/or one large IC engine, greater than 600 bhp)

Facility Data Input: Input "1" (include IC engine) or "0" (omit IC engine).
For distallate fuel oil the default is 0.5% sulfur content by weight. User input is required in "Facility Data Input" for any other sulfur content.
Engine Certification: Input whether or not the IC engine is certified, or is certfied to meet EPA Tier 1, Tier 2, Tier 3, or Blue Sky standards.
The EI will use the appropriate EFs for either a large or small diesel-fueled generator. EI summary sheets combine contributions from just one small (< 600 bhp) and/or one large (> 600 bhp) generator.

General Assumptions (see the next tab sheet for specific assumptions for each tab sheet):

This emissions evaluation is based on IDAPA regulatory requirements current as of spreadsheet version date.
EFs are drawn from AP-42 factors available as of spreadsheet version date.
Average brake-specific fuel consumption of 7,000 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 a density of 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 user **input** of facility-specific parameters)
EmissionInventory lb/hr - Drum dryer baghouse, tank heater, generator, silo filling, and load-out
EmissionInventory TPY - Drum dryer baghouse, tank heater, generator, silo filling, and load-out
Values in Emission Inventories reflect the maximum emissions ONLY from fuel types selected.
FACWIDE TAPs ELs. Used for TAPs EL screening. Includes silo/loadout fugitives.
Lb/hr emissions shown are 24-hr averages for noncarcinogens and annual averages for carcinogens.
Modeling - Criteria Pollutants 1-, 3-, 8-, 24-hour, and annual lb/hr emission rates
Modeling - TAPs 24-hour and annual lb/hr emission rates

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
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 # transfer pts, wind speeds & moisture**
IC1 Emission Factors (Selects appropriate EFs for non-certified engines and EPA Tier 1, 2, 3, and Blue Sky engines)
IC ENGINE 1< 600 bhp (< 447kW) #2 Fuel oil fired
IC2 Emission Factors (Selects appropriate EFs for non-certified engines and EPA Tier 1, 2, 3, and Blue Sky engines)
IC ENGINE 2 > 600 bhp (> 447kW) #2 Fuel oil fired

DEQ ASSUMPTIONS

DEQ assumptions for the "Drum Dryer UsedOil FabricFilter" Calculations
1. Drum Dryer may be either counter-flow or parallel flow (AP-42 specifies no diference in emissions from either type).
2. SO2 emissions are based on the sulfur content and the Scavenging Factor (varies from 50 to 97%). DEQ used a scavenging factor of 63%. The sulfur content of the three waste oil source tests averaged 0.44 % by weight.

DEQ assumptions for the "Drum Dryer NG FabricFilter" Calculations

DEQ assumptions for the "Drum Dryer #2 Oil FabricFilter" Calculations
1. SO2 emissions are based on the sulfur content and the Scavenging Factor (varies from 50 to 97%). DEQ used a scavenging factor of 63%. The sulfur content of the three waste oil source tests averaged 0.44 % by weight.

DEQ assumptions for the "Drum Dryer LPGProp FabricFilter" Calculations

DEQ assumptions for the "TankHtr #2 Oil-AP42 1.3,11.1" Calculations
1. VOC and TAPs emissions from the asphaltic oil storage tank were determined using Tanks 4.0.9d and the Working and Breathing losses were negligible (less than 1% of total VOC emissions).

DEQ assumptions for the "Tank Heater NG-AP42 11.1" Calculations
1. VOC and TAPs emissions from the asphaltic oil storage tank were determined using Tanks 4.0.9d and the Working and Breathing losses were negligible (less than 1% of total VOC emissions).

DEQ assumptions for the "Tank Heater NG-AP42 1.4" Calculations
1. VOC and TAPs emissions from the asphaltic oil storage tank were determined using Tanks 4.0.9d and the Working and Breathing losses were negligible (less than 1% of total VOC emissions).

DEQ assumptions for the "SiloFill Criteria&TAPs" Calculations
1. All PM10 is assumed to be PM2.5.

CURRENT PTC APPLICATION VALUES

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

Facility ID/AIRS No.	XXX-XXXXX	Spreadsheet Date	2/16/2016 15:03
Permit No.	P-20XX.XXXX	DEQ Version Date	7/20/2011
Facility Owner/Company Name:	Facility Name		
Address:	Facility Address		
City, State, Zip:	City, State Zip		
Facility Contact:	Facility Contact		
Contact Number/ e-mail:	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	make/model	Distallate (#2) Fuel Oil	0
Rated heat input capacity, MMBtu/hr	0	Used Oil or RFO4 Oil	0
Drum Dryer Hourly HMA Production, Tons/hour	425	Natural Gas	0
Max Production Per day, Tons per day	0	LPG or Propane	0
Max Annual HMA Production, Tons/year	309,091	Default #2 fuel oil and used oil sulfur content percentage by weight	0.0015% and 0.5%
Min Hours of operation per year (annual/max hourly production)	727	#2 Fuel Oil Max Sulfur Content	0.5000%
		Used Oil/RFO4 Oil Max Sulfur Content	0.7500%

Asphaltic Oil Tank Heater AP-42, Section 11.1 (oil or natural gas fuel), or Section 1.4 (natural gas fuel) (FOR DUCT BURNER EI CALCULATION)

Rated heat input capacity, MMBtu/hr	5.000	**Fuel Type(s)**	**Fuel Toggle**
Hours of operation per day	24	#2 Fuel Oil	1
Operation, days per year (DEQ Assumption)	30.30	Fuel oil sulfur content	0.500%
Max Hours of operation per year (DEQ Assumption)	727	Natural Gas	1

Asphaltic Oil Tank Heater Fuel Consumption Calculations	**#2 Fuel Oil**	**Natural Gas**
Heat Input Rating, MMBtu/hr	5.000	5.000
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]	36.49	4,902
Max Operational Hours per Year	727	727

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

IC Engine EI Conversion Factors			
1 hp = 0.7456999 kW	0.7457	1 lb = (g)	453.59
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Fuel Heating Value, Btu/gal	137,030
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

NOTE: THE HMA EI SUMMARY WORKSHEETS ONLY ALLOWS ONE SMALL AND/OR ONE LARGE IC ENGINE.

IC Engine 1 < 600 bhp (447 kW) AP-42 Section 3.3 (diesel fueled)			
IC Engine Make/Model	make/model	**Fuel Type(s)**	**IC Engine Toggle**
IC Engine Max Rated Power (bhp)	0	#2 Fuel Oil (Diesel)	1
IC Engine Max Rated Capacity (kW)	0	Max Sulfur weight percentage	0.5000%
		Max Operational Hours/Day	24
IC Engine 1 EPA Certification:	0	Max Operational Hours/Year	727
Not EPA-certified: Enter "0" (zero)		Calculated Max Fuel Use Rate, gal/hr	0.00
Certified Tier I, Tier 2, or Tier 3: Enter 1, 2, or 3		Calculated MMBtu/hr	0.00
Certified "BLUE SKY" engine: Enter 4			

ERROR - IC ENGINE 2 RATING IS LESS THAN 600 bhp

IC Engine 2 > 600 bhp (447 kW) AP-42 Section 3.4 (diesel fueled)			
IC Engine Make/Model	make/model	**Fuel Type(s)**	**IC Engine Toggle**
IC Engine Rated Capacity (bhp)	0	#2 Fuel Oil (Diesel)	1
IC Engine Max Rated Capacity (kW)	0	Max Sulfur weight percentage	0.5000%
		Max Operational Hours per Day	24
IC Engine 2 EPA Certification:	0	Max Operational Hours per Year	727
Not EPA-certified: Enter "0" (zero)		Calculated Max Fuel Use Rate, gal/hr	0.00
Certified Tier I, Tier 2, or Tier 3: Enter 1, 2, or 3		Calculated MMBtu/hr	0.00
Certified "BLUE SKY" engine: Enter 5			

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 tr
M = moisture content (%)	3	Bulk aggregate for HMAstypically stabilizes at 3 to 5% by weight.
If higher moisture is maintained, apply additional % control:	90.00%	For M=3% add 10% control. For M=5% add 15% control. 90% cont
Number of front-end loader drop points (aggregate and RAP) (DEQ Assumption)	2	Drops to storage pile(s) and drop(s) to bins
Aggregate weigh conveyor transfer points (DEQ Assumption)	2	Transfer from bins to conveyor & from conveyor to scalping screen
Number of scalping screens (DEQ Assumption)	1	Includes all aggregate and RAP tonnage.
Aggregate conveyor transfer to drum (DEQ Assumption)	1	Includes all aggregate and RAP tonnage.

Facility: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID:** **P-20XX.XXXX** **XXX-XXXXX**

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

Fuel Type Toggle = 0
Max Hourly Production 425 T/hr
Max Daily Production 0 Tons/day
Max Annual Production 309,091 Tons/yr

User Input Weight % Sulfur = 0.7500%
AP-42 EF of 0.058 lb SO2/ton presumed based on #2 oil, max 0.5% sulfur content
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 1.50

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	0.00	0.00	
PM-10 (total) [b]	0.023	0.00	0.00	
PM-2.5 [b1]	0.0223	0.00	0.00	
CO [c]	0.13	0.00	0.00	
NOx [c]	0.055	0.00	0.00	
SO_2 [c]	0.089	0.00	0.00	
VOC [d]	0.032	0.00	0.00	
Lead	1.50E-05	0.00E+00	0.00E+00	
HCl [d,e]	0.00021	0	0.00E+00	
Dioxins[e,f]				
2,3,7,8-TCDD	2.10E-13	0.00E+00	0.00E+00	**0.00E+00**
Total TCDD	9.30E-13	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,7,8-PeCDD	3.10E-13	0.00E+00	0.00E+00	**0.00E+00**
Total PeCDD	2.20E-11	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,4,7,8-HxCDD	4.20E-13	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,6,7,8-HxCDD	1.30E-12	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,7,8,9-HxCDD	9.80E-13	0.00E+00	0.00E+00	**0.00E+00**
Total HxCDD	1.20E-11	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	0.00E+00	0.00E+00	**0.00E+00**
Total HpCDD	1.90E-11	0.00E+00	0.00E+00	**0.00E+00**
Octa CDD	2.50E-11	0.00E+00	0.00E+00	**0.00E+00**
Total PCDD[h]	7.90E-11	0.00E+00	0.00E+00	**0.00E+00**
Furans[e,f]				
2,3,7,8-TCDF	9.70E-13	0.00E+00	0.00E+00	**0.00E+00**
Total TCDF	3.70E-12	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,7,8-PeCDF	4.30E-12	0.00E+00	0.00E+00	**0.00E+00**
2,3,4,7,8-PeCDF	8.40E-13	0.00E+00	0.00E+00	**0.00E+00**
Total PeCDF	8.40E-11	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,4,7,8-HxCDF	4.00E-12	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,6,7,8-HxCDF	1.20E-12	0.00E+00	0.00E+00	**0.00E+00**
2,3,4,6,7,8-HxCDF	1.90E-12	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,7,8,9-HxCDF	8.40E-12	0.00E+00	0.00E+00	**0.00E+00**
Total HxCDF	1.30E-11	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,4,6,7,8-HpCDF	6.50E-12	0.00E+00	0.00E+00	**0.00E+00**
1,2,3,4,7,8,9-HpCDF	2.70E-12	0.00E+00	0.00E+00	**0.00E+00**
Total HpCDF	1.00E-11	0.00E+00	0.00E+00	**0.00E+00**
Octa CDF	4.80E-12	0.00E+00	0.00E+00	**0.00E+00**
Total PCDF[h]	4.00E-11	0.00E+00	0.00E+00	**0.00E+00**
Total PCDD/PCDF[h]	1.20E-10	0.00E+00	0.00E+00	**0.00E+00**
Non-PAH HAPs[f]				
Acetaldehyde[e]	1.30E-03	0.00E+00	0.00E+00	**0.00E+00**
Acrolein[e]	2.60E-05	0.00E+00	0.00E+00	0.00E+00
Benzene[e]	3.90E-04	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	0.00E+00	0.00E+00	0.00E+00
Formaldehyde[e]	3.10E-03	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]	9.20E-04	0.00E+00	0.00E+00	0.00E+00
Isooctane	4.00E-05	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]	2.00E-05	0.00E+00	0.00E+00	0.00E+00
Pentane[e]				
Propionaldehyde[e]	1.30E-04	0.00E+00	0.00E+00	0.00E+00
Quinone[e]	1.60E-04	0.00E+00	0.00E+00	0.00E+00
Methyl chloroform[e]	4.80E-05	0.00E+00	0.00E+00	0.00E+00
Toluene[e]	2.90E-03	0.00E+00	0.00E+00	0.00E+00
Xylene[e]	2.00E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		**0.00E+00**

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	0.00E+00	0.00E+00	**0.00E+00**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene	2.20E-05	0.00E+00	0.00E+00	**0.00E+00**
Anthracene	3.10E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene	2.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[e]	9.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene	1.00E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene	1.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(g,h,i)perylene	4.00E-08	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene	4.10E-08	0.00E+00	0.00E+00	**0.00E+00**
Chrysene	1.80E-07	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Fluorene	1.10E-05	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene	7.00E-09	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[e]	6.50E-04	0.00E+00	0.00E+00	**0.00E+00**
Perylene	8.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Phenanthrene	2.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Pyrene	3.00E-06	0.00E+00	0.00E+00	**0.00E+00**
Non-HAP Organic Compounds[f]				
Acetone[e]	8.30E-04	0.00E+00	0.00E+00	0.00E+00
Benzaldehyde	1.10E-04	0.00E+00	0.00E+00	0.00E+00
Butane	6.70E-04	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde	1.60E-04	0.00E+00	0.00E+00	0.00E+00
Crotonaldehyde[e]	8.60E-05	0.00E+00	0.00E+00	0.00E+00
Ethylene	7.00E-03	0.00E+00	0.00E+00	0.00E+00
Heptane	9.40E-03	0.00E+00	0.00E+00	0.00E+00
Hexanal	1.10E-04	0.00E+00	0.00E+00	0.00E+00
Isovaleraldehyde	3.20E-05	0.00E+00	0.00E+00	0.00E+00
2-Methyl-1-pentene	4.00E-03	0.00E+00	0.00E+00	0.00E+00
2-Methyl-2-butene	5.80E-04	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	1.90E-04	0.00E+00	0.00E+00	0.00E+00
1-Pentene	2.20E-03	0.00E+00	0.00E+00	0.00E+00
n-Pentane	2.10E-04	0.00E+00	0.00E+00	0.00E+00
Valeraldehyde[e]	6.70E-05	0.00E+00	0.00E+00	0.00E+00
Metals[g]				
Antimony[e]	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Arsenic[e]	5.60E-07	0.00E+00	0.00E+00	**0.00E+00**
Barium[e]	5.80E-06	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]				
Cadmium[e]	4.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Chromium[e]	5.50E-06	0.00E+00	0.00E+00	0.00E+00
Cobalt[e]	2.60E-08	0.00E+00	0.00E+00	0.00E+00
Copper[e]	3.10E-06	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]	4.50E-07	0.00E+00	0.00E+00	**0.00E+00**
Manganese[e]	7.70E-06	0.00E+00	0.00E+00	0.00E+00
Mercury[e]	2.60E-06	0.00E+00	0.00E+00	0.00E+00
Molybdenum[e]				
Nickel[e]	6.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Phosphorus[e]	2.80E-05	0.00E+00	0.00E+00	0.00E+00
Silver[e]	4.80E-07	0.00E+00	0.00E+00	0.00E+00
Selenium[e]	3.50E-07	0.00E+00	0.00E+00	0.00E+00
Thallium[e]	4.10E-09	0.00E+00	0.00E+00	0.00E+00
Vanadium[e]				
Zinc[e]	6.10E-05	0.00E+00	0.00E+00	0.00E+00

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
In addition, for SO2 emissions the AP-42 EF of 0.058 lb/ton was adjusted twice. First, to account for the average sulfur content of the fuel used during the source test (0.44% by weight, three tests on waste oil), 0.058 to 0.066. Second, to account for the average scavenging factor of 63% down to 50%, 0.062 to 0.089.
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: **Facility Name**
2/16/2016 15:03 **Permit/ Facility ID: P-20XX.XXXX XXX-XXXXX**

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

Fuel Type Toggle = 0
Max Hourly Production 425 Tons/hr
Max Daily Production 0 Tons/day
Max Annual Production 309,091 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	0.00	0.00	
PM-10 (total)[b]	0.023	0.00	0.00	
PM-2.5 [b1]	0.0223	0.00	0.00	
CO [c]	0.13	0.00	0.00	
NOx [c]	0.026	0.00	0.00	
SO_2 [c]	0.0034	0.00	0.00	
VOC [d]	0.032	0.00	0.00	
Lead	6.20E-07	0.00E+00	0.00E+00	
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	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	0.00E+00	0.00E+00	0.00E+00
Formaldehyde[e]	3.10E-03	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]	9.20E-04	0.00E+00	0.00E+00	0.00E+00
Isooctane	4.00E-05	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	0.00E+00	0.00E+00	0.00E+00
Toluene[e]	1.50E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[e]	2.00E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		**0.00E+00**

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	0.00E+00	0.00E+00	**0.00E+00**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene	8.60E-06	0.00E+00	0.00E+00	**0.00E+00**
Anthracene	2.20E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene	2.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[e]	9.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene	1.00E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene	1.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(g,h,i)perylene	4.00E-08	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene	4.10E-08	0.00E+00	0.00E+00	**0.00E+00**
Chrysene	1.80E-07	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Fluorene	3.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene	7.00E-09	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[e]	9.00E-05	0.00E+00	0.00E+00	**0.00E+00**
Perylene	8.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Phenanthrene	7.60E-06	0.00E+00	0.00E+00	**0.00E+00**
Pyrene	5.40E-07	0.00E+00	0.00E+00	**0.00E+00**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	0.00E+00	0.00E+00	0.00E+00
Heptane	9.40E-03	0.00E+00	0.00E+00	0.00E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	0.00E+00	0.00E+00	0.00E+00
2-Methyl-2-butene	5.80E-04	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	1.90E-04	0.00E+00	0.00E+00	0.00E+00
1-Pentene	2.20E-03	0.00E+00	0.00E+00	0.00E+00
n-Pentane	2.10E-04	0.00E+00	0.00E+00	0.00E+00
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Arsenic[e]	5.60E-07	0.00E+00	0.00E+00	**0.00E+00**
Barium[e]	5.80E-06	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]				
Cadmium[e]	4.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Chromium[e]	5.50E-06	0.00E+00	0.00E+00	0.00E+00
Cobalt[e]	2.60E-08	0.00E+00	0.00E+00	0.00E+00
Copper[e]	3.10E-06	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]	4.50E-07	0.00E+00	0.00E+00	**0.00E+00**
Manganese[e]	7.70E-06	0.00E+00	0.00E+00	0.00E+00
Mercury[e]	2.40E-07	0.00E+00	0.00E+00	0.00E+00
Molybdenum[e]				
Nickel[e]	6.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Phosphorus[e]	2.80E-05	0.00E+00	0.00E+00	0.00E+00
Silver[e]	4.80E-07	0.00E+00	0.00E+00	0.00E+00
Selenium[e]	3.50E-07	0.00E+00	0.00E+00	0.00E+00
Thallium[e]	4.10E-09	0.00E+00	0.00E+00	0.00E+00
Vanadium[e]				
Zinc[e]	6.10E-05	0.00E+00	0.00E+00	0.00E+00

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: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

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

Fuel Type Toggle = 0
Hourly Production 425 T/hr
Daily Production 0 Tons/day
Max Annual Production 309,091 Tons/yr

User Input Weight % Sulfur = 0.5000%
AP-42 EF of 0.058 lb SO2/ton presumed based on #2 oil, max 0.5% sulfur content
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 1.000

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	0.00	0.00	
PM-10 (total)[b]	0.023	0.00	0.00	
PM-2.5[b1]	0.0223	0.00	0.00	
CO[c]	0.13	0.00	0.00	
NOx[c]	0.055	0.00	0.00	
SO_2[c]	0.089	0.00	0.00	
VOC[d]	0.032	0.00	0.00	
Lead	1.50E-05	0.00E+00	0.00E+00	
HCl[d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD	2.10E-13	0	0.00E+00	**0.00E+00**
Total TCDD	9.30E-13	0	0.00E+00	**0.00E+00**
1,2,3,7,8-PeCDD	3.10E-13	0	0.00E+00	**0.00E+00**
Total PeCDD	2.20E-11	0	0.00E+00	**0.00E+00**
1,2,3,4,7,8-HxCDD	4.20E-13	0	0.00E+00	**0.00E+00**
1,2,3,6,7,8-HxCDD	1.30E-12	0	0.00E+00	**0.00E+00**
1,2,3,7,8,9-HxCDD	9.80E-13	0	0.00E+00	**0.00E+00**
Total HxCDD	1.20E-11	0	0.00E+00	**0.00E+00**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	0	0.00E+00	**0.00E+00**
Total HpCDD	1.90E-11	0	0.00E+00	**0.00E+00**
Octa CDD	2.50E-11	0	0.00E+00	**0.00E+00**
Total PCDD[h]	7.90E-11	0	0.00E+00	**0.00E+00**
Furans[e]				
2,3,7,8-TCDF	9.70E-13	0	0.00E+00	**0.00E+00**
Total TCDF	3.70E-12	0	0.00E+00	**0.00E+00**
1,2,3,7,8-PeCDF	4.30E-12	0	0.00E+00	**0.00E+00**
2,3,4,7,8-PeCDF	8.40E-13	0	0.00E+00	**0.00E+00**
Total PeCDF	8.40E-11	0	0.00E+00	**0.00E+00**
1,2,3,4,7,8-HxCDF	4.00E-12	0	0.00E+00	**0.00E+00**
1,2,3,6,7,8-HxCDF	1.20E-12	0	0.00E+00	**0.00E+00**
2,3,4,6,7,8-HxCDF	1.90E-12	0	0.00E+00	**0.00E+00**
1,2,3,7,8,9-HxCDF	8.40E-12	0	0.00E+00	**0.00E+00**
Total HxCDF	1.30E-11	0	0.00E+00	**0.00E+00**
1,2,3,4,6,7,8-HpCDF	6.50E-12	0	0.00E+00	**0.00E+00**
1,2,3,4,7,8,9-HpCDF	2.70E-12	0	0.00E+00	**0.00E+00**
Total HpCDF	1.00E-11	0	0.00E+00	**0.00E+00**
Octa CDF	4.80E-12	0	0.00E+00	**0.00E+00**
Total PCDF[h]	4.00E-11	0	0.00E+00	**0.00E+00**
Total PCDD/PCDF[h]	1.20E-10	0	0.00E+00	**0.00E+00**
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	0.00E+00	0.00E+00	0.00E+00
Formaldehyde[e]	3.10E-03	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]	9.20E-04	0.00E+00	0.00E+00	0.00E+00
Isooctane	4.00E-05	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	0.00E+00	0.00E+00	0.00E+00
Toluene[e]	2.90E-03	0.00E+00	0.00E+00	0.00E+00
Xylene[e]	2.00E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		**0.00E+00**

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	0.00E+00	0.00E+00	**0.00E+00**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene	2.20E-05	0.00E+00	0.00E+00	**0.00E+00**
Anthracene	3.10E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene	2.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[e]	9.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene	1.00E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene	1.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(g,h,I)perylene	4.00E-08	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene	4.10E-08	0.00E+00	0.00E+00	**0.00E+00**
Chrysene	1.80E-07	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Fluorene	1.10E-05	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene	7.00E-09	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[e]	0.00065	0.00E+00	0.00E+00	**0.00E+00**
Perylene	8.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Phenanthrene	2.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Pyrene	3.00E-06	0.00E+00	0.00E+00	**0.00E+00**
Non-HAP Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	0.00E+00	0.00E+00	0.00E+00
Heptane	9.40E-03	0.00E+00	0.00E+00	0.00E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	0.00E+00	0.00E+00	0.00E+00
2-Methyl-2-butene	5.80E-04	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	1.90E-04	0.00E+00	0.00E+00	0.00E+00
1-Pentene	2.20E-03	0.00E+00	0.00E+00	0.00E+00
n-Pentane	2.10E-04	0.00E+00	0.00E+00	0.00E+00
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Arsenic[e]	5.60E-07	0.00E+00	0.00E+00	**0.00E+00**
Barium[e]	5.80E-06	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]				
Cadmium[e]	4.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Chromium[e]	5.50E-06	0.00E+00	0.00E+00	0.00E+00
Cobalt[e]	2.60E-08	0.00E+00	0.00E+00	0.00E+00
Copper[e]	3.10E-06	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]	4.50E-07	0.00E+00	0.00E+00	**0.00E+00**
Manganese[e]	7.70E-06	0.00E+00	0.00E+00	0.00E+00
Mercury[e]	2.60E-06	0.00E+00	0.00E+00	0.00E+00
Molybdenum[e]				
Nickel[e]	6.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Phosphorus[e]	2.80E-05	0.00E+00	0.00E+00	0.00E+00
Silver[e]	4.80E-07	0.00E+00	0.00E+00	0.00E+00
Selenium[e]	3.50E-07	0.00E+00	0.00E+00	0.00E+00
Thallium[e]	4.10E-09	0.00E+00	0.00E+00	0.00E+00
Vanadium[e]				
Zinc[e]	6.10E-05	0.00E+00	0.00E+00	0.00E+00

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
In addition, for SO2 emissions the AP-42 EF of 0.058 lb/ton was adjusted twice. First, to account for the average sulfur content of the fuel used during the source test (0.44% by weight, three tests on waste oil), 0.058 to 0.066. Second, to account for the average scavenging factor of 63% down to 50%, 0.062 to 0.089.
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: **Facility Name**
2/16/2016 15:03 **Permit/ Facility ID: P-20XX.XXXX XXX-XXXXX**

LPG or Propane Fired Drum Mix Asphalt Plant With Fabric Filter

Fuel Type Toggle = 0
Max Hourly Production 425 Tons/hr
Max Daily Production 0 Tons/day
Max Annual Production 309,091 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	0.00	0.00	
PM-10 (total)[b]	0.023	0.00	0.00	
PM-2.5 [b1]	0.0223	0.00	0.00	
CO [c]	0.13	0.00	0.00	
NOx [c1] (Natural Gas EF x 1.5)	0.039	0.00	0.00	
SO_2 [c]	0.0034	0.00	0.00	
VOC [d]	0.032	0.00	0.00	
Lead	6.20E-07	0	0.00E+00	
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	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	0.00E+00	0.00E+00	0.00E+00
Formaldehyde[e]	3.10E-03	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]	9.20E-04	0.00E+00	0.00E+00	0.00E+00
Isooctane	4.00E-05	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	0.00E+00	0.00E+00	0.00E+00
Toluene[e]	1.50E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[e]	2.00E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		**0.00E+00**

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	0.00E+00	0.00E+00	**0.00E+00**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene	8.60E-06	0.00E+00	0.00E+00	**0.00E+00**
Anthracene	2.20E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene	2.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[e]	9.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene	1.00E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene	1.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(g,h,I)perylene	4.00E-08	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene	4.10E-08	0.00E+00	0.00E+00	**0.00E+00**
Chrysene	1.80E-07	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Fluorene	3.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene	7.00E-09	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[e]	9.00E-05	0.00E+00	0.00E+00	**0.00E+00**
Perylene	8.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Phenanthrene	7.60E-06	0.00E+00	0.00E+00	**0.00E+00**
Pyrene	5.40E-07	0.00E+00	0.00E+00	**0.00E+00**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	0.00E+00	0.00E+00	0.00E+00
Heptane	9.40E-03	0.00E+00	0.00E+00	0.00E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	0.00E+00	0.00E+00	0.00E+00
2-Methyl-2-butene	5.80E-04	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	1.90E-04	0.00E+00	0.00E+00	0.00E+00
1-Pentene	2.20E-03	0.00E+00	0.00E+00	0.00E+00
n-Pentane	2.10E-04	0.00E+00	0.00E+00	0.00E+00
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Arsenic[e]	5.60E-07	0.00E+00	0.00E+00	**0.00E+00**
Barium[e]	5.80E-06	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]				
Cadmium[e]	4.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Chromium[e]	5.50E-06	0.00E+00	0.00E+00	0.00E+00
Cobalt[e]	2.60E-08	0.00E+00	0.00E+00	0.00E+00
Copper[e]	3.10E-06	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]	4.50E-07	0.00E+00	0.00E+00	**0.00E+00**
Manganese[e]	7.70E-06	0.00E+00	0.00E+00	0.00E+00
Mercury[e]	2.40E-07	0.00E+00	0.00E+00	0.00E+00
Molybdenum[e]				
Nickel[e]	6.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Phosphorus[e]	2.80E-05	0.00E+00	0.00E+00	0.00E+00
Silver[e]	4.80E-07	0.00E+00	0.00E+00	0.00E+00
Selenium[e]	3.50E-07	0.00E+00	0.00E+00	0.00E+00
Thallium[e]	4.10E-09	0.00E+00	0.00E+00	0.00E+00
Vanadium[e]				
Zinc[e]	6.10E-05	0.00E+00	0.00E+00	0.00E+00

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.

2/16/2016 15:03 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

Asphalt Tank Heater - #2 Oil Fired, Estimated Emissions Using AP-42 Sections 11.1 (HMA Plants) & 1.3 (Fuel Oil Combustion)

Fuel Type Toggle = 1
Fuel Consumption Rate 36.49 gal/hr
Max Daily Operation 24 hr/day
Max Annual Operation 727 hrs/yr

User Input Weight % Sulfur = 0.5000%
AP-42 1.3-1 EF is 0.142S lb SO2 per gallon of fuel oil

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	1.20E-01	0.04	
PM-10 (total) [b] (filterable+cond)	0.0023	8.39E-02	0.03	
PM-2.5 (total) [b] (filterable+cond)	0.00154	0.056	0.02	
CO [b] ("C" EF Rating Factor)	0.005	1.82E-01	0.07	
NOx [b]	0.024	8.76E-01	0.32	
SO_2 [b]	0.071	2.59	0.94	
VOC [d] (NMTOC EF)	5.56E-04	2.03E-02	7.38E-03	
Lead[f]	1.51E-06	5.51E-05	2.00E-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	2.52E-11	9.16E-12	**2.09E-12**
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]	7.60E-13	2.77E-11	1.01E-11	**2.30E-12**
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]	1.50E-11	5.47E-10	1.99E-10	**4.54E-11**
Total HpCDD[c]	2.00E-11	7.30E-10	2.65E-10	**6.06E-11**
Octa CDD[c]	1.60E-10	5.84E-09	2.12E-09	**4.85E-10**
Total PCDD[c]	2.00E-10	7.30E-09	2.65E-09	**6.06E-10**
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]	3.30E-12	1.20E-10	4.38E-11	**1.00E-11**
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]	4.80E-13	1.75E-11	6.37E-12	**1.45E-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	7.30E-11	2.65E-11	**6.06E-12**
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]	9.70E-12	3.54E-10	1.29E-10	**2.94E-11**
Octa CDF[c]	1.20E-11	4.38E-10	1.59E-10	**3.64E-11**
Total PCDF[c]	3.10E-11	1.13E-09	4.11E-10	**9.39E-11**
Total PCDD/PCDF[c]	2.30E-10	8.39E-09	3.05E-09	**6.97E-10**
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	3.50E-06	1.28E-04	4.64E-05	**1.06E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
POM (7-PAH Group)		3.65E-06		**3.03E-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	1.93E-05	7.03E-06	**1.61E-06**
Acenaphthylene[c]	2.00E-07	7.30E-06	2.65E-06	**6.06E-07**
Anthracene[c]	1.80E-07	6.57E-06	2.39E-06	**5.45E-07**
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene[c]	1.00E-07	3.65E-06	1.33E-06	**3.03E-07**
Benzo(e)pyrene				
Benzo(g,h,I)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a.h)anthracene				
Dichlorobenzene				
Fluoranthene[c]	4.40E-08	1.61E-06	5.84E-07	**1.33E-07**
Fluorene[c]	3.20E-08	1.17E-06	4.25E-07	**9.69E-08**
Indeno(1,2,3-cd)pyrene				
Naphthalene[c,e]	1.70E-05	6.20E-04	2.26E-04	**5.15E-05**
Perylene				
Phenanthrene[c]	4.90E-06	1.79E-04	6.50E-05	**1.48E-05**
Pyrene[c]	3.20E-08	1.17E-06	4.25E-07	**9.69E-08**
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	1.92E-04	6.97E-05	1.92E-04
Arsenic[e]	1.32E-06	4.82E-05	1.75E-05	**4.00E-06**
Barium[e]	2.57E-06	9.38E-05	3.41E-05	9.38E-05
Beryllium[e]	2.78E-08	1.01E-06	3.69E-07	**8.42E-08**
Cadmium[e]	3.98E-07	1.45E-05	5.28E-06	**1.21E-06**
Chromium[e]	8.45E-07	3.08E-05	1.12E-05	3.08E-05
Cobalt[e]	6.02E-06	2.20E-04	7.99E-05	2.20E-04
Copper[e]	1.76E-06	6.42E-05	2.34E-05	6.42E-05
Hexavalent Chromium[e]	2.48E-07	9.05E-06	3.29E-06	**7.51E-07**
Manganese[e]	3.00E-06	1.09E-04	3.98E-05	1.09E-04
Mercury[e]	1.13E-07	4.12E-06	1.50E-06	4.12E-06
Molybdenum[e]	7.87E-07	2.87E-05	1.04E-05	2.87E-05
Nickel[e]	8.45E-05	3.08E-03	1.12E-03	**2.56E-04**
Phosphorus[e]	9.46E-06	3.45E-04	1.26E-04	3.45E-04
Silver[e]				
Selenium[e]	6.83E-07	2.49E-05	9.06E-06	2.49E-05
Thallium[e]				
Vanadium[e]	3.18E-05	1.16E-03	4.22E-04	1.16E-03
Zinc[e]	2.91E-05	1.06E-03	3.86E-04	1.06E-03

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, PM10 is 1.3 lb/1,000 gal + 50% of 2.0 lb/1,000 g
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 Distillate Fuel Oil Combustion; Commercial 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: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID:** **P-20XX.XXXX** **XXX-XXXXX**

Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP-42 Section 11.1 (Hot Mix Asphalt Plants)

Fuel Type Toggle =	1	
Fuel Consumption Rate	4,902	scf/hr
Max Daily Operation	24	hr/day
Max Annual Operation	727	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)				
PM-2.5				
CO [c]	**8.90E-06**	4.36E-02	1.59E-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	1.27E-04	4.63E-05	**1.06E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
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: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP-42 Section 1.4 (Natural Gas Combustion)

Fuel Type Toggle = 1
Fuel Consumption Rate 4,902 scf/hr
Max Daily Operation 24 hr/day
Max Annual Operation 727 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	3.73E-02	1.35E-02	
PM-10 (total)[c]	7.6	3.73E-02	1.35E-02	
PM-2.5	7.6	3.73E-02	1.35E-02	
CO [b]	84	4.12E-01	1.50E-01	
NOx [b]	100	4.90E-01	1.78E-01	
SO_2 [c]	0.6	2.94E-03	1.07E-03	
VOC [c]	5.5	2.70E-02	9.80E-03	
Lead [c]	5.00E-04	2.45E-06	8.91E-07	
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	1.03E-05	3.74E-06	**8.55E-07**
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[e]	7.50E-02	3.68E-04	1.34E-04	**3.05E-05**
Hexane[e]	1.80E+00	8.82E-03	3.21E-03	8.82E-03
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[c1, e]	2.60E+00	1.27E-02	4.63E-03	1.27E-02
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c1, e]	3.40E-03	1.67E-05	6.06E-06	1.67E-05
Xylene[e]				
POM (7-PAH Group)		5.59E-08		**4.64E-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	1.18E-07	4.28E-08	**9.77E-09**
3-Methylchloranthrene [c1, e]	1.80E-06	8.82E-09	3.21E-09	**7.33E-10**
Acenaphthene[c1]	1.80E-06	8.82E-09	3.21E-09	**7.33E-10**
Acenaphthylene[c1]	1.80E-06	8.82E-09	3.21E-09	**7.33E-10**
Anthracene[c1]	2.40E-06	1.18E-08	4.28E-09	**9.77E-10**
Benzo(a)anthracene[c1]	1.80E-06	8.82E-09	3.21E-09	**7.33E-10**
Benzo(a)pyrene[c1, e]	1.20E-06	5.88E-09	2.14E-09	**4.88E-10**
Benzo(b)fluoranthenec[1]	1.80E-06	8.82E-09	3.21E-09	**7.33E-10**
Benzo(e)pyrene				
Benzo(g,h,I)perylene[c1]	1.20E-06	5.88E-09	2.14E-09	**4.88E-10**
Benzo(k)fluoranthene[c1]	1.80E-06	8.82E-09	3.21E-09	**7.33E-10**
Chrysene[c1]	1.80E-06	8.82E-09	3.21E-09	**7.33E-10**
Dibenzo(a,h)anthracene[c1]	1.20E-06	5.88E-09	2.14E-09	**4.88E-10**
Dichlorobenzene[c1]	1.20E-03	5.88E-06	2.14E-06	**4.88E-07**
Fluoranthene[c1]	3.00E-06	1.47E-08	5.35E-09	**1.22E-09**
Fluorene[c1]	2.80E-06	1.37E-08	4.99E-09	**1.14E-09**
Indeno(1,2,3-cd)pyrene[c1]	1.80E-06	8.82E-09	3.21E-09	**7.33E-10**
Naphthalene[c1, e]	6.10E-04	2.99E-06	1.09E-06	**2.48E-07**
Perylene				
Phenanthrene[c1]	1.70E-05	8.33E-08	3.03E-08	**6.92E-09**
Pyrene[c1]	5.00E-06	2.45E-08	8.91E-09	**2.03E-09**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane[c1]	2.10E+00	1.03E-02	3.74E-03	1.03E-02
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	9.80E-07	3.57E-07	**8.14E-08**
Barium[d,e]	4.40E-03	2.16E-05	7.84E-06	2.16E-05
Beryllium[e]	1.20E-05	5.88E-08	2.14E-08	**4.88E-09**
Cadmium[d,e]	1.10E-03	5.39E-06	1.96E-06	**4.48E-07**
Chromium[d,e]	1.40E-03	6.86E-06	2.50E-06	6.86E-06
Cobalt[d,e]	8.40E-05	4.12E-07	1.50E-07	4.12E-07
Copper[d,e]	8.50E-04	4.17E-06	1.52E-06	4.17E-06
Hexavalent Chromium[e]				
Manganese[d,e]				
Mercury[d,e]				
Molybdenum[d,e]	1.10E-03	5.39E-06	1.96E-06	5.39E-06
Nickel[d,e]				
Phosphorus[e]				
Silver[e]				
Selenium[d,e]				
Thallium[e]				
Vanadium[d,e]	2.30E-03	1.13E-05	4.10E-06	1.13E-05
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: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Silo Filling Operations AP-42 Section 11.1

Emissions Toggle = 1
Max Hourly Production 425 T/hr
Max Daily Production 0 Tons/day
Max Annual Production 309,091 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	0.2490	0.0905	
PM-10 (total)[b]	5.86E-04	0.2490	0.0905	
PM-2.5[b]	5.86E-04	0.2490	0.0905	
CO[b]	1.18E-03	0.5015	0.1824	
NOx				
SO_2				
VOC[d,g]	1.22E-04	5.18E-02	0.0188	
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	1.66E-03	6.03E-04	0.0001
1,3-Butadiene[e]				
Ethylbenzene[e]	4.63E-06	1.97E-03	7.16E-04	0.00E+00
Formaldehyde[e]	8.41E-05	3.57E-02	1.30E-02	0.0030
Hexane[e]	1.22E-05	5.18E-03	1.88E-03	0.00E+00
Isooctane	3.78E-08	1.61E-05	5.84E-06	0.00E+00
Methyl Ethyl Ketone[e]	4.75E-06	2.02E-03	7.35E-04	0.00E+00
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]		0.00E+00	0.00E+00	
Toluene[e]	7.56E-06	3.21E-03	1.17E-03	0.00E+00
Xylene[e]	3.13E-05	1.33E-02	4.84E-03	0.00E+00
POM (7-PAH Group)		2.87E-04		**2.38E-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	5.69E-03	2.07E-03	4.72E-04
3-Methylchloranthrene[e]				
Acenaphthene	1.19E-06	5.07E-04	1.84E-04	4.21E-05
Acenaphthylene	3.55E-08	1.51E-05	5.49E-06	1.25E-06
Anthracene	3.30E-07	1.40E-04	5.10E-05	1.16E-05
Benzo(a)anthracene	1.42E-07	6.04E-05	2.20E-05	5.02E-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	1.03E-05	3.73E-06	8.51E-07
Benzo(g,h,I)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	2.27E-04	8.24E-05	1.88E-05
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene				
Fluoranthene	3.81E-07	1.62E-04	5.89E-05	1.34E-05
Fluorene	2.56E-06	1.09E-03	3.96E-04	9.05E-05
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene[e]	4.62E-06	1.96E-03	7.14E-04	1.63E-04
Perylene	7.62E-08	3.24E-05	1.18E-05	2.69E-06
Phenanthrene	4.57E-06	1.94E-03	7.06E-04	1.61E-04
Pyrene	1.12E-06	4.75E-04	1.73E-04	3.94E-05
Non-HAP Organic Compounds				
Acetone[e]	6.70E-06	2.85E-03	0.0010	0.00E+00
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	1.34E-04	5.70E-02	0.0207	0.00E+00
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

		LOADOUT	SILO FILL	
Total PM EF = $0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)} + 000332+ 0.00105(-V)e^{((0.0251)(T+460)-20.}$	=	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: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Silo Filling Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle =	0	
Max Hourly Production	425	T/hr
Max Daily Production	0	Tons/day
Max Annual Production	309,091	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	2.54E-04	0.0001	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	1.95E-06	8.29E-04	0.0003	0.00E+00
Chloroethane (Ethyl chloride[e])	4.87E-07	2.07E-04	0.0001	0.00E+00
Chloromethane (Methyl chloride[e])	2.80E-06	1.19E-03	0.0004	0.00E+00
Cumene[e]				
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	3.29E-08	1.40E-05	5.09E-06	0.00E+00
MTBE				
Styrene[e]	6.58E-07	2.80E-04	1.02E-04	0.00E+00
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	1.04E-02	0.0038	0.00E+00
o-Xylene[e] (added into Xylene[e])	6.95E-06	2.95E-03	0.0011	0.00E+00
Phenol[e,f]				
Non-HAP Organic Compounds				
Methane	3.17E-03	1.35E+00	0.4897	0.00E+00

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

Facility: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Load-out Operations **AP-42 Section 11.1**

Emissions Toggle =	1	
Max Hourly Production	425	T/hr
Max Daily Production	0	Tons/day
Max Annual Production	309,091	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	0.222	0.08	
PM-10 (total) [b]	5.22E-04	0.222	0.08	
PM-2.5 [b]	5.22E-04	0.222	0.08	
CO [b]	1.35E-03	0.573	0.21	
NOx				
SO_2				
VOC [d,g]	3.91E-03	1.661	0.60	
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	9.19E-04	3.34E-04	**7.63E-05**
1,3-Butadiene[e]				
Ethylbenzene[e]	1.16E-05	4.95E-03	1.80E-03	0.00E+00
Formaldehyde[e]	3.66E-06	1.56E-03	5.66E-04	**1.29E-04**
Hexane[e]	6.24E-06	2.65E-03	9.64E-04	0.00E+00
Isooctane	7.49E-08	3.18E-05	1.16E-05	0.00E+00
Methyl Ethyl Ketone[e]	2.04E-06	8.66E-04	3.15E-04	0.00E+00
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]	8.73E-06	3.71E-03	1.35E-03	0.00E+00
Xylene[e]	5.03E-05	2.14E-02	7.78E-03	0.00E+00
POM (7-PAH Group)		1.96E-04		**1.62E-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	3.45E-03	1.25E-03	**2.86E-04**
3-Methylchloranthrene[e]				
Acenaphthene	8.86E-07	3.77E-04	1.37E-04	**3.13E-05**
Acenaphthylene	9.55E-08	4.06E-05	1.48E-05	**3.37E-06**
Anthracene	2.39E-07	1.01E-04	3.69E-05	**8.42E-06**
Benzo(a)anthracene	6.48E-08	2.75E-05	1.00E-05	**2.29E-06**
Benzo(a)pyrene[e]	7.84E-09	3.33E-06	1.21E-06	**2.77E-07**
Benzo(b)fluoranthene	2.59E-08	1.10E-05	4.00E-06	**9.14E-07**
Benzo(e)pyrene	2.66E-08	1.13E-05	4.11E-06	**9.38E-07**
Benzo(g,h,l)perylene	6.48E-09	2.75E-06	1.00E-06	**2.29E-07**
Benzo(k)fluoranthene	7.50E-09	3.19E-06	1.16E-06	**2.65E-07**
Chrysene	3.51E-07	1.49E-04	5.43E-05	**1.24E-05**
Dibenzo(a,h)anthracene	1.26E-09	5.36E-07	1.95E-07	**4.45E-08**
Dichlorobenzene				
Fluoranthene	1.70E-07	7.24E-05	2.63E-05	**6.01E-06**
Fluorene	2.63E-06	1.12E-03	4.06E-04	**9.26E-05**
Indeno(1,2,3-cd)pyrene	1.60E-09	6.81E-07	2.48E-07	**5.65E-08**
Naphthalene[e]	4.26E-06	1.81E-03	6.59E-04	**1.50E-04**
Perylene	7.50E-08	3.19E-05	1.16E-05	**2.65E-06**
Phenanthrene	2.76E-06	1.17E-03	4.27E-04	**9.74E-05**
Pyrene	5.11E-07	2.17E-04	7.90E-05	**1.80E-05**
Non-HAP Organic Compounds				
Acetone[e]	1.95E-06	8.27E-04	3.01E-04	0.00E+00
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	2.95E-05	1.25E-02	4.56E-03	0.00E+00
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

		LOADOUT	SILO FILL	
Total PM	$EF = 0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)} + 000332+ 0.00105(-V)e^{((0.0251)(T+460)-20.}$	=	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: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Load-out Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle =	0	
Max Hourly Production	425	T/hr
Max Daily Production	0	Tons/day
Max Annual Production	309,091	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[g]				
Bromomethane[e]	3.99E-07	1.70E-04	6.17E-05	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	5.41E-07	2.30E-04	8.36E-05	0.00E+00
Chloroethane (Ethyl chloride[e])	8.73E-09	3.71E-06	1.35E-06	0.00E+00
Chloromethane (Methyl chloride[e])	6.24E-07	2.65E-04	9.64E-05	0.00E+00
Cumene[e]	4.57E-06	1.94E-03	7.07E-04	0.00E+00
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])				
MTBE				
Styrene[e]	3.04E-07	1.29E-04	4.69E-05	0.00E+00
Tetrachloroethene (Tetrachloroethylene[e])	3.20E-07	1.36E-04	4.95E-05	0.00E+00
1,1,1-Trichloroethane (Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])				
Trichlorofluoromethane	5.41E-08	2.30E-05	8.36E-06	0.00E+00
m-/p-Xylene[e] (added into Xylene[e])	1.71E-05	7.25E-03	2.64E-03	0.00E+00
o-Xylene[e] (added into Xylene[e])	3.33E-05	1.41E-02	5.14E-03	0.00E+00
Phenol[e,f]	4.02E-06	1.71E-03	6.22E-04	0.00E+00
Non-HAP Organic Compounds				
Methane	2.70E-04	1.15E-01	4.18E-02	0.00E+00

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: **Facility Name**
2/16/2016 15:03 **Permit P-20XX.XXXX** **Facility ID: XXX-XXXXX**

G1 Electrical Generator < 600 hp (447 kW)

Fuel Type Toggle =	1	
Fuel Consumption Rate	0.00	gal/hr
Calculated MMBtu/hr	0.000	MMBtu/hr
Max Daily Operation	24	hr/day
Max Annual Operation	727	hrs/yr

Rated Power (kW):	**0**
Not EPA Certified:	Yes
Certified EPA Tier 1:	No
Certified EPA Tier 2:	No
Certified EPA Tier 3:	No
Blue Sky Engine:	No

Conversion Factors:

Avg brake-specific fuel consumption (BSFC) =	7000	Btu/hp-hr
1 hp =	0.746	kW
1 lb =	453.592	g

g/kW-hr x (lb/453g) x (hp-hr/7000 Btu) x (0.746 kW/hp) x 10^6 Btu/MMBtu = lb/MMBtu
g/kW-hr x 0.23486 = lb/MMBtu

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM = PM10
EMISSION FACTORS USED FOR G1 (lb/MMBtu):	**4.41**	**0.36**		**0.95**	**0.310**

AP-42, Ch 3.3 (10/96) EMISSION FACTORS (diesel fueled)

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM = PM10
Emission Factor (lb/MMBtu)	4.41	0.36		0.95	0.31
Emission Factor (g/kW-hr))	18.78	1.53		4.05	1.32

40 CFR 89 and 1039 (updated for <37 kW only), EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM = PM10
kW< 8	1	0	2000	---	*0.36*	2.47	1.88	0.23
kW< 8	2	0	2005	---	*0.36*	1.76	1.88	0.19
kW < 8	4	0	2008	---	---	1.76	1.88	0.09
kW< 8	BlueSky	0	n/a	---	*0.36*	1.08	*1.88*	0.11
8 < kW < 19	1	0	2000	---	*0.36*	2.23	1.55	0.19
8 < kW < 19	2	0	2005	---	*0.36*	1.76	1.55	0.19
8 < kW < 19	4	0	2008	---	---	1.76	1.55	0.19
8 ≤ kW < 19	BlueSky	0	n/a	---	*0.36*	1.06	*1.55*	0.11
19 < kW < 37	1	0	1999	---	*0.36*	2.23	1.29	0.19
19 < kW < 37	2	0	2004	---	*0.36*	1.76	1.29	0.14
19 < kW < 37	4	0	2008	---	---	1.76	1.29	0.07
19 ≤ kW < 37	BlueSky	0	n/a	---	*0.36*	1.06	*1.29*	0.08
37 < kW < 75	1	0	1998	2.16	*0.36*	---	*1.17*	*0.31*
37 < kW < 75	2	0	2004	---	*0.36*	1.76	1.17	0.09
37 < kW < 75	3	0	2008	---	*0.36*	1.10	1.17	0.09
37 ≤ kW < 75	BlueSky	0	n/a	---	*0.36*	1.10	*1.17*	0.06
75 < kW < 130	1	0	1997	2.16	*0.36*	---	*1.17*	*0.31*
75 < kW < 130	2	0	2003	---	*0.36*	1.55	1.17	0.07
75 < kW < 130	3	0	2007	---	*0.36*	0.94	1.17	0.07
75 ≤ kW < 130	BlueSky	0	n/a	---	*0.36*	0.94	*1.17*	0.04
130 < kW < 225	1	0	1996	2.16	0.31	---	2.68	0.13
130 < kW < 225	2	0	2003	---	*0.31*	1.55	0.82	0.05
130 < kW < 225	3	0	2006	---	*0.31*	0.94	0.82	0.05
130 ≤ kW ≤ 560	BlueSky	0	n/a	---	*0.31*	0.94	*0.82*	0.03
225 < kW < 450	1	0	1996	2.16	0.31	---	2.68	0.13
225 < kW < 450	2	0	2001	---	*0.31*	1.50	0.82	0.05
225 ≤ kW < 450	3	0	2006	---	*0.31*	0.94	0.82	0.05
450 < kW < 560	1	0	1996	2.16	0.31	---	2.68	0.13
450 < kW < 560	2	0	2002	---	*0.31*	1.50	0.82	0.05
450 ≤ kW < 560	3	0	2006	---	*0.31*	0.94	0.82	0.05
kW > 560	1	0	2000	2.16	0.31	---	2.68	0.13
kW > 560	2	0	2006	---	*0.31*	1.50	0.82	0.05
kW > 560	BlueSky	0	n/a	---	*0.31*	0.89	*0.82*	0.03

40 CFR 89 and 1039 (updated for <37 kW only), EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM (= PM10)
kW< 8	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW< 8	2	0	2005	0.00	0.00	0.00	0.00	0.00
kW< 8	4	0	2008	0.00	---	0.00	0.00	0.00
kW< 8	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	1	0	2000	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	2	0	2005	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	4	0	2008	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
19 < kW < 37	1	0	1999	0.00	0.00	0.00	0.00	0.00
19 < kW < 37	2	0	2004	0.00	0.00	0.00	0.00	0.00
19 < kW < 37	4	0	2008	0.00	---	0.00	0.00	0.00
19 ≤ kW < 37	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	1	0	1998	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	2	0	2004	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	3	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	1	0	1997	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	2	0	2003	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	3	0	2007	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	1	0	1996	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	2	0	2003	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	3	0	2006	0.00	0.00	0.00	0.00	0.00
130 ≤ kW ≤ 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
225 < kW < 450	1	0	1996	0.00	0.00	0.00	0.00	0.00
225 < kW < 450	2	0	2001	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	3	0	2006	0.00	0.00	0.00	0.00	0.00
450 < kW < 560	1	0	1996	0.00	0.00	0.00	0.00	0.00
450 < kW < 560	2	0	2002	0.00	0.00	0.00	0.00	0.00
450 ≤ kW < 560	3	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW > 560	2	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
EMISSION FACTORS FOR GENERATOR G1 (lb/MMBTU):				**0.00**	**0.00**	**0.00**	**0.00**	**0.000**

Facility: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID:** **P-20XX.XXXX** **XXX-XXXXX**

IC Engine 1 Powering an Electrical Generator < 600 hp (447 kW) AP-42 Section 3.3 (diesel fueled)

Fuel Type Toggle = 1 0 kw
Fuel Consumption Rate 0.00 gal/hr
Calculated MMBtu/hr 0.000 MMBtu/hr
Max Daily Operation 24 hr/day
Max Annual Operation 727 hrs/yr

User Input Weight % Sulfur = 0.5000%
AP-42 3.3 SO2 EF = 0.29 for #2 fuel oil, presumed max 0.5%
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 1.00
Not an EPA-Certified Generator

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	0.000	0.00E+00	
PM-10 (total) [b]	0.31	0.000	0.00E+00	
PM-2.5	0.07	0.000	0.00E+00	
CO [b]	0.95	0.000	0.00E+00	
NOx[b]	4.41	0.000	0.00E+00	
SO_2 [b] (total SOx presumed SO2)	0.29	0.00E+00	0.00E+00	
VOC [b] (total TOC--> VOCs)	0.36	0.000	0.00E+00	
Lead				
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]				
1,2,3,6,7,8-HxCDD				
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	0.00E+00	0.00E+00	**0.00E+00**
Acrolein[c]	9.25E-05	0.00E+00	0.00E+00	0.00E+00
Benzene[c,e]	9.33E-04	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[c,e]	3.91E-05	0.00E+00	0.00E+00	**0.00E+00**
Ethylbenzene[e]				
Formaldehyde[c,e]	1.18E-03	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	4.09E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[c,e]	2.85E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		**0.00E+00**

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	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene[c]	5.06E-06	0.00E+00	0.00E+00	**0.00E+00**
Anthracene[c]	1.87E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene[c]	1.68E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[c,e]	1.88E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene[c]	9.91E-08	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene				
Benzo(g,h,I)perylene[c]	4.89E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene[c]	1.55E-07	0.00E+00	0.00E+00	**0.00E+00**
Chrysene[c]	3.53E-07	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene[c]	5.83E-07	0.00E+00	0.00E+00	**0.00E+00**
Dichlorobenzene				
Fluoranthene[c]	7.61E-06	0.00E+00	0.00E+00	**0.00E+00**
Fluorene[c]	2.92E-05	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene[c]	3.75E-07	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[c,e]	8.48E-05	0.00E+00	0.00E+00	**0.00E+00**
Perylene				
Phenanthrene[c]	2.94E-05	0.00E+00	0.00E+00	**0.00E+00**
Pyrene[c]	4.78E-06	0.00E+00	0.00E+00	**0.00E+00**
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: **Facility Name**
2/16/2016 15:03 **Permit** **P-20XX.XXXX**

Facility ID: XXX-XXXXX
ERROR - GENERATOR RATING IS LESS THAN 447 kW

G2 Electrical Generator > 600 hp (447 kW)

Fuel Type Toggle =	1	
Fuel Consumption Rate	0.00	gal/hr
Calculated MMBtu/hr	0.00	MMBtu/hr
Max Daily Operation	24	hr/day
Max Annual Operation	727	hrs/yr

Rated Power (kW): **0**

Not EPA Certified:	Yes
Certified EPA Tier 1:	No
Certified EPA Tier 2:	No
Certified EPA Tier 3:	No
Blue Sky Engine:	No

Conversion Factors:

Avg brake-specific fuel consumption (BSFC) =	7000	Btu/hp-hr
1 hp =	0.746	kW
1 lb =	453.592	g

g/kW-hr x (lb/453g) x (hp-hr/7000 Btu) x (0.746 kW/hp) x 10^6 Btu/MMBtu = lb/MMBtu
g/kW-hr x 0.23486 = lb/MMBtu

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM=PM10
EMISSION FACTORS USED FOR G2 (lb/MMBtu):	**3.20**	**0.09**		**0.85**	**0.130**

AP-42, Ch 3.4 (10/96) EMISSION FACTORS (diesel fueled, uncontrolled)

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM10
Emission Factor (lb/MMBtu)	3.2	0.09		0.85	0.13
Emission Factor (g/kW-hr))	13.63	0.38		3.62	0.55

Note: Rating for AP-42 PM10 EF of 0.0573 is "E" or Poor. Used Tier 1 PM EF and presumed PM = PM10

40 CFR 89, EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM = PM10
kW< 8	1	0	2000	---	0.36	2.47	1.88	0.23
kW< 8	2	0	2005	---	0.36	1.76	1.88	0.19
kW< 8	BlueSky	0	n/a	---	0.36	1.08	1.88	0.11
8 < kW < 19	1	0	2000	---	0.36	2.23	1.55	0.19
8 < kW < 19	2	0	2005	---	0.36	1.76	1.55	0.19
8 ≤ kW < 19	BlueSky	0	n/a	---	0.36	1.06	1.55	0.11
19 < kW < 37	1	0	1999	---	0.36	2.23	1.29	0.19
19 < kW < 37	2	0	2004	---	0.36	1.76	1.29	0.14
19 ≤ kW < 37	BlueSky	0	n/a	---	0.36	1.06	1.29	0.085
37 < kW < 75	1	0	1998	2.16	0.36	---	0.95	0.31
37 < kW < 75	2	0	2004	---	0.36	1.76	1.17	0.09
37 < kW < 75	3	0	2008	---	0.36	1.10	1.17	0.09
37 ≤ kW < 75	BlueSky	0	n/a	---	0.36	1.10	1.17	0.056
75 < kW < 130	1	0	1997	2.16	0.36	---	0.95	0.31
75 < kW < 130	2	0	2003	---	0.36	1.55	1.17	0.07
75 < kW < 130	3	0	2007	---	0.36	0.94	1.17	0.07
75 ≤ kW < 130	BlueSky	0	n/a	---	0.36	0.94		0.042
130 < kW < 225	1	0	1996	2.16	0.31	---	2.68	0.13
130 < kW < 225	2	0	2003	---	0.31	1.55	0.82	0.05
130 < kW < 225	3	0	2006	---	0.31	0.94	0.82	0.05
130 ≤ kW ≤ 560	BlueSky	0	n/a	---	0.31	0.94	0.82	0.028
225 < kW < 450	1	0	1996	2.16	0.31	---	2.68	0.13
225 < kW < 450	2	0	2001	---	0.31	1.50	0.82	0.05
225 ≤ kW < 450	3	0	2006	---	0.31	0.94	0.82	0.05
450 < kW < 560	1	0	1996	2.16	0.31	---	2.68	0.13
450 < kW ≤ 560	2	0	2002	---	0.31	1.50	0.82	0.05
450 ≤ kW ≤ 560	3	0	2006	---	0.31	0.94	0.82	0.05
kW > 560	1	0	2000	2.16	0.31	---	2.68	0.13
kW > 560	2	0	2006	---	0.31	1.50	0.82	0.05
kW > 560	BlueSky	0	n/a	---	0.31	0.89	0.82	0.028

40 CFR 89, EPA CERTIFIED GENERATOR EMISSION FACTORS FOR GENERATOR G1 (lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM10
kW< 8	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW< 8	2	0	2005	0.00	0.00	0.00	0.00	0.00
kW< 8	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	1	0	2000	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	2	0	2005	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
19 < kW < 37	1	0	1999	0.00	0.00	0.00	0.00	0.00
19 < kW < 37	2	0	2004	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	1	0	1998	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	2	0	2004	0.00	0.00	0.00	0.00	0.00
37 < kW < 75	3	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	1	0	1997	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	2	0	2003	0.00	0.00	0.00	0.00	0.00
75 < kW < 130	3	0	2007	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	1	0	1996	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	2	0	2003	0.00	0.00	0.00	0.00	0.00
130 < kW < 225	3	0	2006	0.00	0.00	0.00	0.00	0.00
130 ≤ kW ≤ 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
225 < kW < 450	1	0	1996	0.00	0.00	0.00	0.00	0.00
225 < kW < 450	2	0	2001	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	3	0	2006	0.00	0.00	0.00	0.00	0.00
450 < kW < 560	1	0	1996	0.00	0.00	0.00	0.00	0.00
450 < kW < 560	2	0	2002	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	3	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW > 560	2	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
EMISSION FACTORS FOR GENERATOR G2 (lb/MMBTU):				**0.00**	**0.00**	**0.00**	**0.00**	**0.000**

Facility: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID:** **P-20XX.XXXX** **XXX-XXXXX** **ERROR - IC ENGINE 2 RATING IS LESS THAN 600 bhp**

IC Engine 2 Powering an Electrical Generator > 600 hp (447 kW) AP-42 Section 3.4 (diesel fueled, uncontrolled)

Fuel Type Toggle =	1		0 kw	User Input Weight % Sulfur = 0.5000%
Fuel Consumption Rate	0.00	gal/hr		AP-42 3.4-1 SO2 EF = 1.01 x S
Calculated MMBtu/hr	0.00	MMBtu/hr		
Max Daily Operation	24	hr/day		Not an EPA-Certified Generator
Max Annual Operation	727	hrs/yr		

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	0.000	0.00E+00	0.00E+00
PM-10 (total) [d]	0.13	0.000	0.00E+00	0.00E+00
PM-2.5	0.0556	0.000	0.00E+00	0.00E+00
CO [b]	0.85	0.000	0.00E+00	
NOx[b]	3.20	0.000	0.00E+00	0.00E+00
SO_2 [b] (total SOx presumed SO2)	0.505	0.000	0.000	0.00E+00
VOC [b] (total TOC--> VOCs)	0.09	0.000	0.000	
Lead				
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]				
1,2,3,6,7,8-HxCDD				
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	0.00E+00	0.00E+00	**0.00E+00**
Acrolein[c]	7.88E-06	0.00E+00	0.00E+00	0.00E+00
Benzene[c,e]	7.76E-04	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[c,e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	7.89E-05	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	2.81E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[c,e]	1.93E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		**0.00E+00**

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c1]	4.68E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene[c1]	9.23E-06	0.00E+00	0.00E+00	**0.00E+00**
Anthracene[c1]	1.23E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene[c1]	6.22E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[c1,e]	2.57E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene[c1]	1.11E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene				
Benzo(g,h,I)perylene[c1]	5.56E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene[c1]	2.18E-07	0.00E+00	0.00E+00	**0.00E+00**
Chrysene[c1]	1.53E-06	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene[c1]	3.46E-07	0.00E+00	0.00E+00	**0.00E+00**
Dichlorobenzene				
Fluoranthene[c1]	4.03E-06	0.00E+00	0.00E+00	**0.00E+00**
Fluorene[c1]	1.28E-05	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene[c1]	4.14E-07	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[c1,e]	1.30E-04	0.00E+00	0.00E+00	**0.00E+00**
Perylene				
Phenanthrene[c1]	4.08E-05	0.00E+00	0.00E+00	**0.00E+00**
Pyrene[c1]	3.71E-06	0.00E+00	0.00E+00	**0.00E+00**
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: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID:** **P-20XX.XXXX** **XXX-XXXXX**

Max Hourly Production	425 T/hr	96% T/hr is Aggregate & RAP =	**408 T/hr**
Max Daily Production	0 Tons/day	96% T/day is Aggregate & RAP =	**0 T/day**
Max Annual Production	309,091 Tons/yr	96% T/yr is Aggregate & RAP =	**296,727 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)

$E = k\,(0.0032) \times (U/5)^{1.3} / (M/2)^{1.4}$ = 3.31E-03 for PM 1.56E-03 lb/ton for PM10 2.37E-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 =	**3 %**		

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 stabiliizes 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	F = Eavg mph/ E@10mph
Cat 1:	1.54	0.77	1.72	1.59E-04	0.1016	2.41E-05	0.1016
Cat 2:	3.09	2.32	5.18	6.65E-04	0.4251	1.01E-04	0.4251
Cat 3:	5.14	4.12	9.20	1.40E-03	0.8979	2.13E-04	0.8979
Cat 4:	8.23	6.69	14.95	2.64E-03	1.687	3.99E-04	1.687
Cat 5:	10.80	9.52	21.28	4.17E-03	2.670	6.32E-04	2.670
Cat 6:	14.00	12.40	27.74	5.89E-03	3.767	8.92E-04	3.767

Aggregate Front End Loader Drop Points

Drop to storage pile and drop to bins: **408 T/hr** **2** Transfer Points

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (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	Total Emissions: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	1.35	0.00	0.49	0.11	2.70	0.00	0.98	0.22
PM-10 (total)	1.56E-03	0.64	0.00	0.23	0.05	1.28	0.00	0.46	0.11
PM-2.5	2.37E-04	0.10	0.00	0.04	0.01	0.19	0.00	0.07	0.02

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 **90%** control to lb/hr, etc. for the higher moisture.

Aggregate Weigh Conveyor

Transfer from bins to conveyor and from conveyor to scalping screen: **408 T/hr** **2** Transfer Points

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (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	Total Emissions: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	1.35E-01	0.00E+00	4.90E-02	1.12E-02	2.70E-01	0.00E+00	9.81E-02	2.24E-02
PM-10 (total)	1.56E-03	6.38E-02	0.00E+00	2.32E-02	5.30E-03	1.28E-01	0.00E+00	4.64E-02	1.06E-02
PM-2.5	2.37E-04	9.66E-03	0.00E+00	3.51E-03	8.02E-04	1.93E-02	0.00E+00	7.02E-03	1.60E-03

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

Aggregate flow across scalping screen onto conveyor: **408 T/hr**

Pollutant	Emission Factor Table 11.19.2-2 SCREENING UNCONTROLLED (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.025	1.020	0.00E+00	3.71E-01	8.47E-02
PM-10 (total)	0.0087	0.355	0.00E+00	1.29E-01	2.95E-02
PM-2.5	1.30E-04	0.005	0.00E+00	1.93E-03	4.40E-04

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

Aggregate transfer from conveyor to drum dryer (1 transfer point): **408 T/hr**

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (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)	3.31E-03	1.35E-01	0.00E+00	4.90E-02	1.12E-02
PM-10 (total)	1.56E-03	6.38E-02	0.00E+00	2.32E-02	5.30E-03
PM-2.5	2.37E-04	9.66E-03	0.00E+00	3.51E-03	8.02E-04

Scalping Scrn & Transfer Points

Facility: **Facility Name**
2/16/2016 15:03 **Permit/Facility ID: P-20XX.XXXX XXX-XXXXX**

Asphalt Tank Heater - #2 Oil Fired, Estimated GHG Emissions Using AP-42 Sections 11.1 (HMA Plants) & 1.3 (Fuel Oil Combustion)

Hot Mix Plant Fuel Type Toggle (#2) =	0
Hot Mix Plant Fuel Type Toggle (Used Oil) =	0
Hot Mix Plant Fuel Type Toggle (NG) =	0
Hot Mix Plant Fuel Type Toggle (LPG) =	0
Tank Heater Fuel Type Toggle (NG) =	1
Tank Heater Fuel Type Toggle (#2) =	1

Note: CO2e emissions from the silo, loadout operation, and the tanks were assumed to be negligible (less than 1 ton per year).

Green House Gas Emissions When Combusting #2 Fuel Oil

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	0.00	1.00	0.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	0.00	21.00	0.00
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	0.000000	310.00	0.00

Tank Heater	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e T/yr
CO_2	Assumes all carbon is converted to CO_2			350.29	1	350.29
Methane	0.216	lb/10^3 gal	AP-42 Table 1.3-3	2.87E-03	21	0.06
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	2.51E+00	310	777.78

Green House Gas Emissions When Combusting Used Oil

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	0.00	1.00	0.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	0.00	21.00	0.00
N_2O	0.53	lb/10^3 gal	AP-42 Table 1.3-8	0.000000	310.00	0.00

Green House Gas Emissions When Combusting Natural Gas

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	0.00	1.00	0.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	0.00	21.00	0.00
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	0.000000	310.00	0.00

Tank Heater	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e T/yr
CO_2	0.12	lb/scf	AP-42 Table 1.4-2	213.90	1	213.90
Methane	0.0000023	lb/scf	AP-42 Table 1.4-2	4.10E-03	21	0.09
N_2O	0.0000022	lb/scf	AP-42 Table 1.4-2	3.92E-03	310	1.22

Green House Gas Emissions When Combusting LPG

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	0.00	1.00	0.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	0.00	21.00	0.00
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	0.000000	310.00	0.00

Green House Gas Emissions When Combusting Diesel Fuel

IC Engine 1 < 600 bhp	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	1.16	lb/bhp-hr	AP-42 Table 3.4-1	0.00	1.00	0.00

IC Engine 2 > 600 bhp	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	1.16	lb/bhp-hr	AP-42 Table 3.4-1	0.00	1.00	0.00

Total Green House Gas Emissions

Total Emissions	CO_2e (T/yr)
CO_2	350.29
Methane	0.09
N_2O	777.78
Grand Total	**1,128.15**

Facility: Facility Name
2/16/2016 15:03 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

EMISSION INVENTORY

POUNDS PER HOUR

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

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 0 Tons/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = 24 hrs/day
B. Tank Heater: 5.0000 MMBtu/hr 727 Hours/year Natural Gas
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil 24 hrs/day
C1. IC Engine 1: 0.00 gal/hour 727.272941 Hours/year IC Engine < 600hp #2 Fuel Oil 24 hrs/day
C2. IC Engine 2: 0.00 gal/hour 727.272941 Hours/year IC Engine > 600hp #2 Fuel Oil 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)	C IC Engine 1 + IC Engine 2 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)	0.00	1.20E-01	0.00E+00	4.71E-01	0.59
PM-10 (total)	0.00	8.39E-02	0.00E+00	4.71E-01	0.55
PM-2.5	0.00	5.62E-02	0.00E+00	4.71E-01	0.53
CO	0.00	4.12E-01	0.00E+00	1.07E+00	1.49
NOx	0.00	8.76E-01	0.00E+00		0.88
SO_2	0.00	2.59E+00	0.00E+00		2.59
VOC	0.00	2.70E-02	0.00E+00	1.71E+00	1.74
Lead	0.00E+00	5.51E-05	0.00E+00		5.51E-05
HCl [e]	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Dioxins[e]					
2,3,7,8-TCDD	0.00E+00				0.00E+00
Total TCDD	0.00E+00				0.00E+00
1,2,3,7,8-PeCDD	0.00E+00				0.00E+00
Total PeCDD	0.00E+00				0.00E+00
1,2,3,4,7,8-HxCDD	0.00E+00	2.09E-12			2.09E-12
1,2,3,6,7,8-HxCDD	0.00E+00				0.00E+00
1,2,3,7,8,9-HxCDD	0.00E+00	2.30E-12			2.30E-12
Total HxCDD	0.00E+00				0.00E+00
1,2,3,4,6,7,8-Hp-CDD	0.00E+00	4.54E-11			4.54E-11
Total HpCDD	0.00E+00	6.06E-11			6.06E-11
Octa CDD	0.00E+00	4.85E-10			4.85E-10
Total PCDD[h]	0.00E+00	6.06E-10			6.06E-10
Furans[e]					
2,3,7,8-TCDF	0.00E+00				0.00E+00
Total TCDF	0.00E+00	1.00E-11			1.00E-11
1,2,3,7,8-PeCDF	0.00E+00				0.00E+00
2,3,4,7,8-PeCDF	0.00E+00				0.00E+00
Total PeCDF	0.00E+00	1.45E-12			1.45E-12
1,2,3,4,7,8-HxCDF	0.00E+00				0.00E+00
1,2,3,6,7,8-HxCDF	0.00E+00				0.00E+00
2,3,4,6,7,8-HxCDF	0.00E+00				0.00E+00
1,2,3,7,8,9-HxCDF	0.00E+00				0.00E+00
Total HxCDF	0.00E+00	6.06E-12			6.06E-12
1,2,3,4,6,7,8-HpCDF	0.00E+00				0.00E+00
1,2,3,4,7,8,9-HpCDF	0.00E+00				0.00E+00
Total HpCDF	0.00E+00	2.94E-11			2.94E-11
Octa CDF	0.00E+00	3.64E-11			3.64E-11
Total PCDF[h]	0.00E+00	9.39E-11			9.39E-11
Total PCDD/PCDF[h]	0.00E+00	6.97E-10	0.00E+00		6.97E-10
Non-PAH HAPs					
Acetaldehyde[e]	0.00E+00		0.00E+00		0.00E+00
Acrolein[e]	0.00E+00		0.00E+00		0.00E+00
Benzene[e]	0.00E+00	8.55E-07	0.00E+00	2.14E-04	2.15E-04
1,3-Butadiene[e]			0.00E+00		0.00E+00
Ethylbenzene[e]	0.00E+00			0.00E+00	0.00E+00
Formaldehyde[e]	0.00E+00	3.05E-05	0.00E+00	3.10E-03	3.13E-03
Hexane[e]	0.00E+00	8.82E-03		0.00E+00	8.82E-03
Isooctane	0.00E+00			0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]	0.00E+00			0.00E+00	0.00E+00
Pentane[e]		1.27E-02			1.27E-02
Propionaldehyde[e]	0.00E+00				0.00E+00
Quinone[e]	0.00E+00				0.00E+00
Methyl chloroform[e]	0.00E+00				0.00E+00
Toluene[e]	0.00E+00	1.67E-05	0.00E+00	0.00E+00	1.67E-05
Xylene[e]	0.00E+00		0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)[e]	0.00E+00	3.07E-07	0.00E+00	4.01E-05	4.04E-05
TOTAL PAH HAPs	0.00E+00	7.02E-05	0.00E+00	1.74E-03	1.81E-03

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C IC Engine IC1 + IC2 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)
PAH HAPs					
2-Methylnaphthalene	0.00E+00	9.77E-09		7.58E-04	7.58E-04
3-Methylchloranthrene[e]	0.00E+00	7.33E-10			7.33E-10
Acenaphthene	0.00E+00	1.61E-06	0.00E+00	7.34E-05	7.50E-05
Acenaphthylene	0.00E+00	6.06E-07	0.00E+00	4.62E-06	5.23E-06
Anthracene	0.00E+00	5.45E-07	0.00E+00	2.01E-05	2.06E-05
Benzo(a)anthracene[e]	0.00E+00	7.33E-10	0.00E+00	7.30E-06	7.30E-06
Benzo(a)pyrene[e]	0.00E+00	4.88E-10	0.00E+00	2.77E-07	2.77E-07
Benzo(b)fluoranthene[e]	0.00E+00	3.03E-07	0.00E+00	9.14E-07	1.22E-06
Benzo(e)pyrene	0.00E+00	0.00E+00		1.79E-06	1.79E-06
Benzo(g,h,I)perylene	0.00E+00	4.88E-10	0.00E+00	2.29E-07	2.29E-07
Benzo(k)fluoranthene[e]	0.00E+00	7.33E-10	0.00E+00	2.65E-07	2.65E-07
Chrysene[e]	0.00E+00	7.33E-10	0.00E+00	3.12E-05	3.12E-05
Dibenzo(a,h)anthracene[e]	0.00E+00	4.88E-10	0.00E+00	4.45E-08	4.50E-08
Dichlorobenzene	0.00E+00	4.88E-07			4.88E-07
Fluoranthene	0.00E+00	1.33E-07	0.00E+00	1.95E-05	1.96E-05
Fluorene	0.00E+00	9.69E-08	0.00E+00	1.83E-04	1.83E-04
Indeno(1,2,3-cd)pyrene[e]	0.00E+00	7.33E-10	0.00E+00	5.65E-08	5.73E-08
Naphthalene[e]	0.00E+00	5.15E-05	0.00E+00	3.13E-04	3.65E-04
Perylene	0.00E+00	0.00E+00		5.33E-06	5.33E-06
Phenanthrene	0.00E+00	1.48E-05	0.00E+00	2.59E-04	2.74E-04
Pyrene	0.00E+00	9.69E-08	0.00E+00	5.75E-05	5.76E-05
Non-HAP Organic Compounds					
Acetone[e]	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Benzaldehyde	0.00E+00	0.00E+00			0.00E+00
Butane	0.00E+00	1.03E-02			1.03E-02
Butyraldehyde	0.00E+00	0.00E+00			0.00E+00
Crotonaldehyde[e]	0.00E+00	0.00E+00			0.00E+00
Ethylene	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Heptane	0.00E+00	0.00E+00			0.00E+00
Hexanal	0.00E+00	0.00E+00			0.00E+00
Isovaleraldehyde	0.00E+00	0.00E+00			0.00E+00
2-Methyl-1-pentene	0.00E+00	0.00E+00			0.00E+00
2-Methyl-2-butene	0.00E+00	0.00E+00			0.00E+00
3-Methylpentane	0.00E+00	0.00E+00			0.00E+00
1-Pentene	0.00E+00	0.00E+00			0.00E+00
n-Pentane	0.00E+00	0.00E+00			0.00E+00
Valeraldehyde[e]	0.00E+00	0.00E+00			0.00E+00
Metals					
Antimony[e]	0.00E+00	1.92E-04			1.92E-04
Arsenic[e]	0.00E+00	4.00E-06			4.00E-06
Barium[e]	0.00E+00	9.38E-05			9.38E-05
Beryllium[e]	0.00E+00	8.42E-08			8.42E-08
Cadmium[e]	0.00E+00	1.21E-06			1.21E-06
Chromium[e]	0.00E+00	3.08E-05			3.08E-05
Cobalt[e]	0.00E+00	2.20E-04			2.20E-04
Copper[e]	0.00E+00	6.42E-05			6.42E-05
Hexavalent Chromium[e]	0.00E+00	7.51E-07			7.51E-07
Manganese[e]	0.00E+00	1.09E-04			1.09E-04
Mercury[e]	0.00E+00	4.12E-06			4.12E-06
Molybdenum[e]	0.00E+00	2.87E-05			2.87E-05
Nickel[e]	0.00E+00	2.56E-04			2.56E-04
Phosphorus[e]	0.00E+00	3.45E-04			3.45E-04
Silver[e]	0.00E+00	0.00E+00			0.00E+00
Selenium[e]	0.00E+00	2.49E-05			2.49E-05
Thallium[e]	0.00E+00	0.00E+00			0.00E+00
Vanadium[e]	0.00E+00	1.16E-03			1.16E-03
Zinc[e]	0.00E+00	1.06E-03			1.06E-03

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

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

A. Drum Mix Plant: **425** Tons/hour **727** Hours/year **309,091** Tons/year HMA throughput **0** hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected =
B. Tank Heater: **5.0000** MMBtu/hr **727** Hours/year **24** hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Natural Gas
C1. IC Engine 1: **0.00** gal/hour **727.2729412** Hours/year #2 Fuel Oil Generator < 600hp **24** hrs/day
C2. IC Engine 2: **0.00** gal/hour **727.2729412** Hours/year #2 Fuel Oil Generator > 600hp **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)	C **IC 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[g]					
Bromomethane[e]				0.00E+00	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)					
Carbon disulfide[e]				0.00E+00	0.00E+00
Chloroethane (Ethyl chloride[e])				0.00E+00	0.00E+00
Chloromethane (Methyl chloride[e])				0.00E+00	0.00E+00
Cumene				0.00E+00	0.00E+00
n-Hexane					
Methylene chloride (Dichloromethane[e])				0.00E+00	0.00E+00
MTBE					
Styrene[e]				0.00E+00	0.00E+00
Tetrachloroethene (Tetrachloroethylene[e])				0.00E+00	0.00E+00
1,1,1-Trichloroethane (Methyl chloroform[e])					
Trichloroethene (Trichloroethylene[e])					
Trichlorofluoromethane				0.00E+00	0.00E+00
m-/p-Xylene[e]				0.00E+00	0.00E+00
o-Xylene[e]				0.00E+00	0.00E+00
Phenol[e,f]				0.00E+00	0.00E+00
Non-HAP Organic Compounds					
Methane				0.00E+00	0.00E+00

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: Facility Name
2/16/2016 15:03 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

EMISSION INVENTORY

TONS PER YEAR

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

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year HMA throughput 0 hrs/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected =
B. Tank Heater: 5.0000 MMBtu/hr 727 Hours/year 24 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. IC Engine 1: 0.00 gal/hour 727.272941 Hours/year IC Engine <600hp #2 Fuel Oil 24 hrs/day
C2. IC Engine 2: 0.00 gal/hour 727.272941 Hours/year IC Engine > 600hp #2 Fuel Oil 24 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 IC Engine IC1 + IC2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling, Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	0.00	4.38E-02	0.00E+00	0.00E+00	0.04
PM-10 (total)	0.00	3.05E-02	0.00E+00	0.00E+00	0.03
PM-2.5	0.00	2.04E-02	0.00E+00	0.00E+00	0.02
CO	0.00	1.50E-01	0.00E+00	0.00E+00	0.15
NOx	0.00	3.18E-01	0.00E+00		0.32
SO_2	0.00	9.42E-01	0.00E+00		0.94
VOC	0.00	9.80E-03	0.00E+00	0.00E+00	0.01
Lead	0.00E+00	2.00E-05	0.00E+00		2.00E-05
HCl [e]	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Dioxins[e]					
2,3,7,8-TCDD	0.00E+00				0.00E+00
Total TCDD	0.00E+00				0.00E+00
1,2,3,7,8-PeCDD	0.00E+00				0.00E+00
Total PeCDD	0.00E+00				0.00E+00
1,2,3,4,7,8-HxCDD	0.00E+00	9.16E-12			9.16E-12
1,2,3,6,7,8-HxCDD	0.00E+00				0.00E+00
1,2,3,7,8,9-HxCDD	0.00E+00	1.01E-11			1.01E-11
Total HxCDD	0.00E+00				0.00E+00
1,2,3,4,6,7,8-Hp-CDD	0.00E+00	1.99E-10			1.99E-10
Total HpCDD	0.00E+00	2.65E-10			2.65E-10
Octa CDD	0.00E+00	2.12E-09			2.12E-09
Total PCDD[h]	0.00E+00	2.65E-09			2.65E-09
Furans[e]					
2,3,7,8-TCDF	0.00E+00				0.00E+00
Total TCDF	0.00E+00	4.38E-11			4.38E-11
1,2,3,7,8-PeCDF	0.00E+00				0.00E+00
2,3,4,7,8-PeCDF	0.00E+00				0.00E+00
Total PeCDF	0.00E+00	6.37E-12			6.37E-12
1,2,3,4,7,8-HxCDF	0.00E+00				0.00E+00
1,2,3,6,7,8-HxCDF	0.00E+00				0.00E+00
2,3,4,6,7,8-HxCDF	0.00E+00				0.00E+00
1,2,3,7,8,9-HxCDF	0.00E+00				0.00E+00
Total HxCDF	0.00E+00	2.65E-11			2.65E-11
1,2,3,4,6,7,8-HpCDF	0.00E+00				0.00E+00
1,2,3,4,7,8,9-HpCDF	0.00E+00				0.00E+00
Total HpCDF	0.00E+00	1.29E-10			1.29E-10
Octa CDF	0.00E+00	1.59E-10			1.59E-10
Total PCDF[h]	0.00E+00	4.11E-10			4.11E-10
Total PCDD/PCDF[h]	0.00E+00	3.05E-09			3.05E-09
Non-PAH HAPs					
Acetaldehyde[e]	0.00E+00		0.00E+00		0.00E+00
Acrolein[e]	0.00E+00		0.00E+00		0.00E+00
Benzene[e]	0.00E+00	3.74E-06	0.00E+00	0.00E+00	3.74E-06
1,3-Butadiene[e]	0.00E+00		0.00E+00		0.00E+00
Ethylbenzene[e]	0.00E+00			0.00E+00	0.00E+00
Formaldehyde[e]	0.00E+00	1.34E-04	0.00E+00	0.00E+00	1.34E-04
Hexane[e]	0.00E+00	3.21E-03		0.00E+00	3.21E-03
Isooctane	0.00E+00			0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]	0.00E+00			0.00E+00	0.00E+00
Pentane[e]	0.00E+00	4.63E-03			4.63E-03
Propionaldehyde[e]	0.00E+00				0.00E+00
Quinone[e]	0.00E+00				0.00E+00
Methyl chloroform[e]	0.00E+00				0.00E+00
Toluene[e]	0.00E+00	6.06E-06	0.00E+00	0.00E+00	6.06E-06
Xylene[e]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL Federal HAPs (T/yr)=					1.07E-02

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (T/yr)	C IC Engine IC1 + IC2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PAH HAPs					
2-Methylnaphthalene	0.00E+00	4.28E-08		0.00E+00	4.28E-08
3-Methylchloranthrene[e]	0.00E+00	3.21E-09			3.21E-09
Acenaphthene	0.00E+00	7.03E-06	0.00E+00	0.00E+00	7.03E-06
Acenaphthylene	0.00E+00	2.65E-06	0.00E+00	0.00E+00	2.65E-06
Anthracene	0.00E+00	2.39E-06	0.00E+00	0.00E+00	2.39E-06
Benzo(a)anthracene[e]	0.00E+00	3.21E-09	0.00E+00	0.00E+00	3.21E-09
Benzo(a)pyrene[e]	0.00E+00	2.14E-09	0.00E+00	0.00E+00	2.14E-09
Benzo(b)fluoranthene[e]	0.00E+00	1.33E-06	0.00E+00	0.00E+00	1.33E-06
Benzo(e)pyrene	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Benzo(g,h,I)perylene	0.00E+00	2.14E-09	0.00E+00	0.00E+00	2.14E-09
Benzo(k)fluoranthene[e]	0.00E+00	3.21E-09	0.00E+00	0.00E+00	3.21E-09
Chrysene[e]	0.00E+00	3.21E-09	0.00E+00	0.00E+00	3.21E-09
Dibenzo(a,h)anthracene[e]	0.00E+00	2.14E-09	0.00E+00	0.00E+00	2.14E-09
Dichlorobenzene	0.00E+00	2.14E-06			2.14E-06
Fluoranthene	0.00E+00	5.84E-07	0.00E+00	0.00E+00	5.84E-07
Fluorene	0.00E+00	4.25E-07	0.00E+00	0.00E+00	4.25E-07
Indeno(1,2,3-cd)pyrene[e]	0.00E+00	3.21E-09	0.00E+00	0.00E+00	3.21E-09
Naphthalene[e]	0.00E+00	2.26E-04	0.00E+00	0.00E+00	2.26E-04
Perylene	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Phenanthrene	0.00E+00	6.50E-05	0.00E+00	0.00E+00	6.50E-05
Pyrene	0.00E+00	4.25E-07	0.00E+00	0.00E+00	4.25E-07
Non-HAP Organic Compounds					
Acetone[e]	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Benzaldehyde	0.00E+00	0.00E+00			0.00E+00
Butane	0.00E+00	3.74E-03			3.74E-03
Butyraldehyde	0.00E+00	0.00E+00			0.00E+00
Crotonaldehyde[e]	0.00E+00	0.00E+00			0.00E+00
Ethylene	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Heptane	0.00E+00	0.00E+00			0.00E+00
Hexanal	0.00E+00	0.00E+00			0.00E+00
Isovaleraldehyde	0.00E+00	0.00E+00			0.00E+00
2-Methyl-1-pentene	0.00E+00	0.00E+00			0.00E+00
2-Methyl-2-butene	0.00E+00	0.00E+00			0.00E+00
3-Methylpentane	0.00E+00	0.00E+00			0.00E+00
1-Pentene	0.00E+00	0.00E+00			0.00E+00
n-Pentane[e]	0.00E+00	0.00E+00			0.00E+00
Valeraldehyde[e]	0.00E+00	0.00E+00			0.00E+00
Metals					
Antimony[e]	0.00E+00	6.97E-05			6.97E-05
Arsenic[e]	0.00E+00	1.75E-05			1.75E-05
Barium[e]	0.00E+00	3.41E-05			3.41E-05
Beryllium[e]	0.00E+00	3.69E-07			3.69E-07
Cadmium[e]	0.00E+00	5.28E-06			5.28E-06
Chromium[e]	0.00E+00	1.12E-05			1.12E-05
Cobalt[e]	0.00E+00	7.99E-05			7.99E-05
Copper[e]	0.00E+00	2.34E-05			2.34E-05
Hexavalent Chromium[e]	0.00E+00	3.29E-06			3.29E-06
Manganese[e]	0.00E+00	3.98E-05			3.98E-05
Mercury[e]	0.00E+00	1.50E-06			1.50E-06
Molybdenum[e]	0.00E+00	1.04E-05			1.04E-05
Nickel[e]	0.00E+00	1.12E-03			1.12E-03
Phosphorus[e]	0.00E+00	1.26E-04			1.26E-04
Silver[e]	0.00E+00	0.00E+00			0.00E+00
Selenium[e]	0.00E+00	9.06E-06			9.06E-06
Thallium[e]	0.00E+00				0.00E+00
Vanadium[e]	0.00E+00	4.22E-04			4.22E-04
Zinc[e]	0.00E+00	3.86E-04			3.86E-04

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

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 0 Tons/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected =
B. Tank Heater: 5.0000 MMBtu/hr 727 Hours/year 24 hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Natural Gas
C1. Generator G1: 0.00 gal/hour 727.2729412 Hours/year #2 Fuel Oil IC Engine <600hp 24 hrs/day
C2. Generator G2: 0.00 gal/hour 727.2729412 Hours/year #2 Fuel Oil IC Engine > 600hp 24 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 Generator Max Emission Rate for Pollutant (T/yr)	D Load-out, Silo Filling, & Tank Storage Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
non-PAH HAPs[a]					
Bromomethane[e]				0.00E+00	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)					0.00E+00
Carbon disulfide[e]				0.00E+00	0.00E+00
Chloroethane (Ethyl chloride[e])				0.00E+00	0.00E+00
Chloromethane (Methyl chloride[e])				0.00E+00	0.00E+00
Cumene				0.00E+00	0.00E+00
n-Hexane				0.00E+00	0.00E+00
Methylene chloride (Dichloromethane[e])				0.00E+00	0.00E+00
MTBE					0.00E+00
Styrene[e]				0.00E+00	0.00E+00
Tetrachloroethene (Tetrachloroethylene[e])				0.00E+00	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				0.00E+00	0.00E+00
m-/p-Xylene[e]				0.00E+00	0.00E+00
o-Xylene[e]				0.00E+00	0.00E+00
Phenol[e,f]				0.00E+00	0.00E+00
Non-HAP Organic Compounds					
Methane				0.00E+00	0.00E+00

e) IDAPA Toxic Air Pollutant

Facility: Facility Name

2/16/2016 15:03 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

CRITERIA POLLUTANT MODELING

POUNDS PER HOUR - POINT AND PSEUDO-STACK SOURCES

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

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year

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

B. Tank Heater: 5.0000 MMBtu Rate 727 Hours/year

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

C1. IC Engine 1: 0.00 gal/hour 727.2729412 Hours/year IC Engine < 600hp

C2. IC Engine 2: 0.00 gal/hour 727.2729412 Hours/year IC Engine > 600hp

0 Tons/day		. hr/day	727 hr/yr	
	0.5000% S	0.7500% S	24 hrs/day	
0.5000% S	#2 Fuel Oil		Natural Gas	
0.5000% S	#2 Fuel Oil		24 hrs/day	
0.5000% S	#2 Fuel Oil		24 hrs/day	

Max 1-hour, 3-hour, and 8-hour averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 IC2 > 600 bhp Generator 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)	0.00	8.39E-02	0.00E+00	0.00E+00	2.49E-01	2.22E-01	
PM-2.5	0.00	5.62E-02	0.00E+00	0.00E+00	2.49E-01	2.22E-01	
CO	0.00	4.12E-01	0.00E+00	0.00E+00	5.01E-01	5.73E-01	
NOx	0.00	8.76E-01	0.00E+00	0.00E+00			
SO_2	0.00	2.59E+00	0.00E+00	0.00E+00			
VOC	0.00	2.70E-02	0.00E+00	0.00E+00	5.18E-02	1.66E+00	
Lead	0.00E+00	5.51E-05					

Max 24-hour averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 G1 < 600 hp Generator Max Emission Rate for Pollutant (lb/hr)	C2 G2 > 600hp Generator 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)	0.00	8.39E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
PM-2.5	0.00	5.62E-02	0.00E+00	0	0.00E+00	0.00E+00	
CO							
NOx							
SO_2	0.00	2.59E+00	0.00E+00	0.00E+00			
VOC							
Lead							

Max Annual averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 G1< 600 hp Generator Max Emission Rate for Pollutant (lb/hr)	C2 G2 > 600hp Generator 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)	0.00	6.97E-03	0.00E+00	0.00E+00	2.07E-02	1.84E-02	
PM-2.5	0.00	4.67E-03					
CO							
NOx	0.00	7.27E-02	0.00	0.00			
SO_2	0.00	0.22	0.00E+00	0.00			
VOC							
Lead							

Facility: Facility Name

2/16/2016 15:03 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

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, Silo Fill/Load-out - Generator not included

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 0 Tons/day

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

B. Tank Heater: 5.0000 MMBtu Rated 727 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

C1. IC Engine G1: 0.00 gal/hour 727.2729412 Hours/year IC Engine <600hp #2 Fuel Oil 24 hrs/day

C2. IC Engine G2: 0.00 gal/hour 727.2729412 Hours/year IC Engine > 600hp #2 Fuel Oil 24 hrs/day

Pollutant	TOTAL of Max Emission Rates from A, B, & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled? Meets AAC or AACC?
HCl[e]	0.000	0.05	No	
Dioxins		Toxic Equivalency Factor[c]	Adjusted Emission Rate (lb/hr)	
2,3,7,8-TCDD	0.00E+00	1.0	0.00E+00	
Total TCDD	0.00E+00	n/a		
1,2,3,7,8-PeCDD	0.00E+00	1.0	0.00E+00	
Total PeCDD	0.00E+00	n/a		
1,2,3,4,7,8-HxCDD	2.09E-12	0.1	2.09E-13	
1,2,3,6,7,8-HxCDD	0.00E+00	0.1	0.00E+00	
1,2,3,7,8,9-HxCDD	2.30E-12	0.1	2.30E-13	
Total HxCDD	0.00E+00	n/a		
1,2,3,4,6,7,8-Hp-CDD	4.54E-11	0.01	4.54E-13	
Total HpCDD	6.06E-11	n/a		
Octa CDD	4.85E-10	0.0003	1.45E-13	
Total PCDD	6.06E-10	n/a		
Furans				
2,3,7,8-TCDF	0.00E+00	0.1	0.00E+00	
Total TCDF	1.00E-11	n/a		
1,2,3,7,8-PeCDF	0.00E+00	0.03	0.00E+00	
2,3,4,7,8-PeCDF	0.00E+00	0.3	0.00E+00	
Total PeCDF	1.45E-12	n/a		
1,2,3,4,7,8-HxCDF	0.00E+00	0.1	0.00E+00	
1,2,3,6,7,8-HxCDF	0.00E+00	0.1	0.00E+00	
2,3,4,6,7,8-HxCDF	0.00E+00	0.1	0.00E+00	
1,2,3,7,8,9-HxCDF	0.00E+00	0.1	0.00E+00	
Total HxCDF	6.06E-12	n/a		
1,2,3,4,6,7,8-HpCDF	0.00E+00	0.01	0.00E+00	
1,2,3,4,7,8,9-HpCDF	0.00E+00	0.01	0.00E+00	
Total HpCDF	2.94E-11	n/a		
Octa CDF	3.64E-11	0.0003	1.09E-14	
Total PCDF	9.39E-11	n/a		
Total PCDD/PCDF	6.97E-10	n/a		
TOTAL	Adjusted lb/hr	TAPs EL for 2,3,7,8 TCDD	Exceeds TAPs EL?	Modeled?
Dioxin/Furans[c]	1.05E-12	1.50E-10	No	
Non-PAH HAPs				
Acetaldehyde	0.00E+00	3.00E-03	No	
Acrolein	0.00E+00	0.017	No	
Benzene	2.15E-04	8.00E-04	No	
1,3-Butadiene				
Ethylbenzene	0.00E+00	29	No	
Formaldehyde	3.13E-03	5.10E-04	Exceeds	
Hexane	8.82E-03	12	No	
Isooctane	0.00E+00			
Methyl Ethyl Ketone	0.00E+00	39.3	No	
Pentane	1.27E-02	118	No	
Propionaldehyde	0.00E+00	0.0287	No	
Quinone	0.00E+00	0.027	No	
Methyl chloroform	0.00E+00	127	No	
Toluene	1.67E-05	25	No	
Xylene	0.00E+00	29	No	

Pollutant	TOTAL of Max Emission Rates from A, B, & 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	7.58E-04	9.10E-05	Exceeds	
3-Methylchloranthrene	7.33E-10	2.50E-06	No	
Acenaphthene	7.50E-05	9.10E-05	No	
Acenaphthylene	5.23E-06	9.10E-05	No	
Anthracene	2.06E-05	9.10E-05	No	
Benzo(a)anthracene	7.30E-06			see POM
Benzo(a)pyrene	2.77E-07	2.00E-06	No	see POM
Benzo(b)fluoranthene	1.22E-06			see POM
Benzo(e)pyrene	1.79E-06	9.10E-05	No	
Benzo(g,h,I)perylene	2.29E-07	9.10E-05	No	
Benzo(k)fluoranthene	2.65E-07			see POM
Chrysene	3.12E-05			see POM
Dibenzo(a,h)anthracene	4.50E-08			see POM
Dichlorobenzene	4.88E-07	9.10E-05	No	
Fluoranthene	1.96E-05	9.10E-05	No	
Fluorene	1.83E-04	9.10E-05	Exceeds	
Indeno(1,2,3-cd)pyrene	5.73E-08			see POM
Naphthalene[e]	3.65E-04	9.10E-05	Exceeds	
Perylene	5.33E-06	9.10E-05	No	
Phenanthrene	2.74E-04	9.10E-05	Exceeds	
Pyrene	5.76E-05	9.10E-05	No	
PolycyclicOrganicMatter[d]	4.04E-05	2.00E-06	Exceeds	
Non-HAP Organic Compounds				
Acetone	0.00E+00	119	No	
Benzaldehyde	0.00E+00			
Butane	1.03E-02			
Butyraldehyde	0.00E+00			
Crotonaldehyde	0.00E+00	0.38	No	
Ethylene	0.00E+00			
Heptane	0.00E+00	109	No	
Hexanal	0.00E+00			
Isovaleraldehyde	0.00E+00			
2-Methyl-1-pentene	0.00E+00			
2-Methyl-2-butene	0.00E+00			
3-Methylpentane	0.00E+00			
1-Pentene	0.00E+00			
n-Pentane[e]	0.00E+00	118	No	
Valeraldehyde (n-Valeraldehyde)	0.00E+00	11.7	No	
Metals				
Antimony[e]	1.92E-04	0.033	No	
Arsenic	4.00E-06	1.50E-06	Exceeds	
Barium	9.38E-05	0.033	No	
Beryllium	8.42E-08	2.80E-05	No	
Cadmium	1.21E-06	3.70E-06	No	
Chromium	3.08E-05	0.033	No	
Cobalt	2.20E-04	0.0033	No	
Copper	6.42E-05	0.013	No	
Hexavalent Chromium	7.51E-07	5.60E-07	Exceeds	
Manganese	1.09E-04	0.067	No	
Mercury	4.12E-06	0.003	No	
Molybdenum	2.87E-05	0.333	No	
Nickel	2.56E-04	2.70E-05	Exceeds	
Phosphorus	3.45E-04	0.007	No	
Silver	0.00E+00	0.007	No	
Selenium	2.49E-05	0.013	No	
Thallium	0.00E+00	0.007	No	
Vanadium	1.16E-03	0.003	No	
Zinc	1.06E-03	0.667	No	

a) Reserved.

b) Toxic Air Pollutants, IDAPA 58.01.01.585 and .586, levels in effect as of February 25, 2009

c) 2005, Van den Berg, et al, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds, *Toxicological Sciences* 93(2), 223-241 (2006). Accessible at http://toxsci.oxfordjournals.org/cgi/reprint/93/2/223.
Use of the 2005 WHO toxic equivalency factors (TEFs) is consistent with current EPA recommendations for TRI reporting (72 FR 26544, May 10, 2007)
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 highlighted PAHs h shall be considered together as one TAP equivalent in potency to benzo(a)pyrene.

e) Naphthalene is listed as a noncarcinogenic TAP in IDAPA 58.01.01.585 (EL = 3.33 lb/hr), but must also be considered as a carcinogenic PAH (EL = 9.10E-05 lb/hr)

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: Facility Name

2/16/2016 15:03 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

TAPs EL Screen - ALL SOURCES

Max Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Silo Fill/Load-out - Generator not included

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 0 Tons/day

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

B. Tank Heater: 5.0000 MMBtu Rated 727 Hours/year

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

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

C1. IC Engine G1: 0.00 gal/hour 727.2729412 Hours/year #2 Fuel Oil 24 hrs/day

C2. IC Engine G2: 0.00 gal/hour 727.2729412 Hours/year #2 Fuel Oil 24 hrs/day

Pollutant	TOTAL of Max Emission Rates from A, B, & 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])	0.00E+00	1.27	No	
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	0.00E+00	2	No	
Chloroethane (Ethyl chloride[e])	0.00E+00	176	No	
Chloromethane (Methyl chloride[e])	0.00E+00	6.867	No	
Cumene[e]	0.00E+00	16.3	No	
n-Hexane[e] (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	0.00E+00	1.60E-03	No	
MTBE	0.00E+00			
Styrene[e]	0.00E+00	6.67	No	
Tetrachloroethene (Tetrachloroethylene[e])	0.00E+00	1.30E-02	No	
1,1,1-Trichloroethane (see Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])	0.00E+00	17.93	No	
Trichlorofluoromethane	0.00E+00			
m-/p-Xylene[e] (added into Xylene[e])				
o-Xylene[e] (added into Xylene[e])				
Phenol[e,f]	0.00E+00	1.27	No	
Non-HAP Organic Compounds				
Methane	0.00E+00			

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: Facility Name

2/16/2016 15:03 Permit/Facility ID: P-20XX.XXXX XXX-XXXXX

TAPs MODELING

POUNDS PER HOUR - POINT AND PSEUDO-STACK SOURCES

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

A. Drum Mix Plant: 425 Tons/hour 727 Hours/year 309,091 Tons/year 0 Tons/day

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

B. Tank Heater: 5.0000 MMBtu Rated 727 Hours/year 24 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. IC Engine: 0.00 gal/hour 727.2729412 Hours/year IC Engine < 600hp #2 Fuel Oil 24 hrs/day

C2. IC Engine: 0.00 gal/hour 727.2729412 Hours/year IC Engine > 600hp #2 Fuel Oil 24 hrs/day

Pollutant	A Drum Dryer Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 * see note IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 * see note IC2 > 600 bhp Generator 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)						
PM-2.5						
CO						
NOx						
SO_2						
VOC						
Lead						
HCl [e]	0.00E+00	0.00E+00	0	0		
Dioxins[e]						
2,3,7,8-TCDD	0.00E+00		0	0		
Total TCDD	0.00E+00		0	0		
1,2,3,7,8-PeCDD	0.00E+00		0	0		
Total PeCDD	0.00E+00		0	0		
1,2,3,4,7,8-HxCDD	0.00E+00	2.09E-12	0	0		
1,2,3,6,7,8-HxCDD	0.00E+00		0	0		
1,2,3,7,8,9-HxCDD	0.00E+00	2.30E-12	0	0		
Total HxCDD	0.00E+00		0	0		
1,2,3,4,6,7,8-Hp-CDD	0.00E+00	4.54E-11	0	0		
Total HpCDD	0.00E+00	6.06E-11	0	0		
Octa CDD	0.00E+00	4.85E-10	0	0		
Total PCDD[h]	0.00E+00	6.06E-10	0	0		
Furans[e]						
2,3,7,8-TCDF	0.00E+00		0	0		
Total TCDF	0.00E+00	1.00E-11	0	0		
1,2,3,7,8-PeCDF	0.00E+00		0	0		
2,3,4,7,8-PeCDF	0.00E+00		0	0		
Total PeCDF	0.00E+00	1.45E-12	0	0		
1,2,3,4,7,8-HxCDF	0.00E+00		0	0		
1,2,3,6,7,8-HxCDF	0.00E+00		0	0		
2,3,4,6,7,8-HxCDF	0.00E+00		0	0		
1,2,3,7,8,9-HxCDF	0.00E+00		0	0		
Total HxCDF	0.00E+00	6.06E-12	0	0		
1,2,3,4,6,7,8-HpCDF	0.00E+00		0	0		
1,2,3,4,7,8,9-HpCDF	0.00E+00		0	0		
Total HpCDF	0.00E+00	2.94E-11	0	0		
Octa CDF	0.00E+00	3.64E-11	0	0		
Total PCDF[h]	0.00E+00	9.39E-11	0	0		
Total PCDD/PCDF[h]	0.00E+00	6.97E-10	0	0		
Non-PAH HAPs						
Acetaldehyde[e]	0.00E+00		0	0		
Acrolein[e]	0.00E+00		0	0		
Benzene[e]	0.00E+00	8.55E-07	0	0	1.38E-04	7.63E-05
1,3-Butadiene[e]			0	0		
Ethylbenzene[e]	0.00E+00		0	0	0.00E+00	0.00E+00
Formaldehyde[e]	0.00E+00	3.05E-05	0	0	2.97E-03	1.29E-04
Hexane[e]	0.00E+00	8.82E-03	0	0	0.00E+00	0.00E+00
Isooctane	0.00E+00		0	0	0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]	0.00E+00		0	0	0.00E+00	0.00E+00
Pentane[e]		1.27E-02	0	0		
Propionaldehyde[e]	0.00E+00		0	0		
Quinone[e]	0.00E+00		0	0		
Methyl chloroform[e]	0.00E+00		0	0		
Toluene[e]	0.00E+00	1.67E-05	0	0	0.00E+00	0.00E+00
Xylene[e]	0.00E+00		0	0	0.00E+00	0.00E+00
POM (7-PAH Group)	0.00E+00	3.07E-07		0.00E+00	2.38E-05	1.62E-05

e) IDAPA Toxic Air Pollutant

Pollutant	A Drum Dryer Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 * see note IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 * see note IC2 > 600 bhp Generator 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	0.00E+00	9.77E-09	0	0	4.72E-04	2.86E-04
3-Methylchloranthrene[e]	0.00E+00	7.33E-10	0	0		
Acenaphthene	0.00E+00	1.61E-06	0	0	4.21E-05	3.13E-05
Acenaphthylene	0.00E+00	6.06E-07	0	0	1.25E-06	3.37E-06
Anthracene	0.00E+00	5.45E-07	0	0	1.16E-05	8.42E-06
Benzo(a)anthracene[e]	0.00E+00	7.33E-10	0	0	5.02E-06	2.29E-06
Benzo(a)pyrene[e]	0.00E+00	4.88E-10	0	0	0.00E+00	2.77E-07
Benzo(b)fluoranthene[e]	0.00E+00	3.03E-07	0	0	0.00E+00	9.14E-07
Benzo(e)pyrene	0.00E+00	0.00E+00	0	0	8.51E-07	9.38E-07
Benzo(g,h,I)perylene	0.00E+00	4.88E-10	0	0	0.00E+00	2.29E-07
Benzo(k)fluoranthene[e]	0.00E+00	7.33E-10	0	0	0.00E+00	2.65E-07
Chrysene[e]	0.00E+00	7.33E-10	0	0	1.88E-05	1.24E-05
Dibenzo(a,h)anthracene[e]	0.00E+00	4.88E-10	0	0	0.00E+00	4.45E-08
Dichlorobenzene	0.00E+00	4.88E-07	0	0		
Fluoranthene	0.00E+00	1.33E-07	0	0	1.34E-05	6.01E-06
Fluorene	0.00E+00	9.69E-08	0	0	9.05E-05	9.26E-05
Indeno(1,2,3-cd)pyrene[e]	0.00E+00	7.33E-10	0	0	0.00E+00	5.65E-08
Naphthalene[e]	0.00E+00	5.15E-05	0	0	1.63E-04	1.50E-04
Perylene	0.00E+00	0.00E+00	0	0	2.69E-06	2.65E-06
Phenanthrene	0.00E+00	1.48E-05	0	0	1.61E-04	9.74E-05
Pyrene	0.00E+00	9.69E-08	0	0	3.94E-05	1.80E-05
Non-HAP Organic Compounds						
Acetone[e]	0.00E+00	0.00E+00	0	0	0.00E+00	0.00E+00
Benzaldehyde	0.00E+00	0.00E+00	0	0		
Butane	0.00E+00	1.03E-02	0	0		
Butyraldehyde	0.00E+00	0.00E+00	0	0		
Crotonaldehyde[e]	0.00E+00	0.00E+00	0	0		
Ethylene	0.00E+00	0.00E+00	0	0	0.00E+00	0.00E+00
Heptane	0.00E+00	0.00E+00	0	0		
Hexanal	0.00E+00	0.00E+00	0	0		
Isovaleraldehyde	0.00E+00	0.00E+00	0	0		
2-Methyl-1-pentene	0.00E+00	0.00E+00	0	0		
2-Methyl-2-butene	0.00E+00	0.00E+00	0	0		
3-Methylpentane	0.00E+00	0.00E+00	0	0		
1-Pentene	0.00E+00	0.00E+00	0	0		
n-Pentane	0.00E+00	0.00E+00	0	0		
Valeraldehyde[e]	0.00E+00	0.00E+00	0	0		
Metals						
Antimony[e]	0.00E+00	1.92E-04	0	0		
Arsenic[e]	0.00E+00	4.00E-06	0	0		
Barium[e]	0.00E+00	9.38E-05	0	0		
Beryllium[e]	0.00E+00	8.42E-08	0	0		
Cadmium[e]	0.00E+00	1.21E-06	0	0		
Chromium[e]	0.00E+00	3.08E-05	0	0		
Cobalt[e]	0.00E+00	2.20E-04	0	0		
Copper[e]	0.00E+00	6.42E-05	0	0		
Hexavalent Chromium[e]	0.00E+00	7.51E-07	0	0		
Manganese[e]	0.00E+00	1.09E-04	0	0		
Mercury[e]	0.00E+00	4.12E-06	0	0		
Molybdenum[e]	0.00E+00	2.87E-05	0	0		
Nickel[e]	0.00E+00	2.56E-04	0	0		
Phosphorus[e]	0.00E+00	3.45E-04	0	0		
Silver[e]	0.00E+00	0.00E+00	0	0		
Selenium[e]	0.00E+00	2.49E-05	0	0		
Thallium[e]	0.00E+00	0.00E+00	0	0		
Vanadium[e]	0.00E+00	1.16E-03	0	0		
Zinc[e]	0.00E+00	1.06E-03	0	0		

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 – FACILITY DRAFT COMMENTS

The following comments were received from the facility on January 8, 9, and February 25, 2016:

Facility Comment: The applicant provided the drum manufacturer date as 2014.

DEQ Response: 1993 is replaced with 2014 in Table 1 of the SOB and Table 1.1 of the permit.

Facility Comment: the applicant requested to keep the fuel types that were originally permitted for the old drum dryer and for the existing asphalt tank heater in the modified permit

DEQ Response: The fuel types that were permitted in 4/28/2006 PTC are kept in the modified permit, and related permit conditions in the 2006 permit have been put back to the modified PTC.

Facility Comment: the applicant requested to add liquefied petroleum gas (LPG) and propane as fuel types for the duct burner and the asphalt tank heater.

DEQ Response: the two fuels are added to the modified permit. Adding these two fuel types does not change the PTE or allowable emissions from the plant.

Facility Comment: The applicant requested a clarification regarding used fuel oil and RFO4 fuel oil.

"*I am wondering which fuel the heading, Used Oil Fuel, refers to? Is this any used oil fuel including RFO4 or is this a different type of used fuel as is allowed in permit condition 3.6 in the last bullet point?*"

DEQ Response: The drum dryer is permitted to burn used fuel oil and RFO4. DEQ's EI spreadsheet treats them as the same type of oil.

Both used fuel oil and RFO4 is required to meet the specifications in Permit Condition 3.7.

Facility Comment: "*the allowance to use ASTM Grade 2 Fuel Oil in our generator engines should the plant remain in one location more than 12 months and the emission limit associated with this alternate fuel type versus ULSD which we burn currently since our generator engines are classified as non-road engines due to our current portable nature. A clarification on the allowable emission when/if using ASTM Grade 2 Fuel Oil being permitted should we switch could also prove to be useful in the future.*"

DEQ Response: The engines were permitted to burn No.2 fuel oil in the 2006 permit. Should Poe choose to resume the use of No.2 fuel oil when the engines are no longer meet the definition of non-road engines in the future; it should be allowed. However, once the engines become stationary engines, they are subject to 40 CFR 63 Subpart ZZZZ. According to EPA's "once in always in" policy, these engines could be forever subject to 40 CFR 63 Subpart ZZZZ.

APPENDIX C – PROCESSING FEE

The facility is subject to $1,000 PTC processing fee in accordance with IDAPA 58.01.01.225.

Emissions Inventory	
Pollutant	Annual Emissions Change (T/yr)
NO_X	-2.5
SO_2	-7.7
CO	-5.9
PM_{10}	-1.0
VOC	-1.5
TAPS/HAPS	-6.8E-04
Total:	**-18.6**
Fee Due	**$ 1,000.00**