Statement of Basis
Hot Mix Asphalt Plant General Permit

Permit to Construct No. P-2008.0058
Project ID 62568

Sunroc Corporation dba Depatco, Inc. - 00430
Portable, Idaho

Facility ID 777-00430

Final

May 4, 2021

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Permit Writer

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

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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
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
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
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

This portable HMA plant that consists of aggregate and RAP pile and bin storage and handling, a drum mix dryer, a heated aboveground asphalt oil storage tank, and HMA conveyors, storage silos and truck load-out.

Stockpiled aggregate is transferred to feed bins. Aggregate may consist of up to 50 percent RAP with no effect on facility emissions. Aggregate is dispensed from the bins onto feeder conveyors, which transfer the aggregate to the drum mix dryer. Aggregate travels through the rotating drum dryer, and when dried, the aggregate is mixed with liquid asphalt cement. The resulting HMA is then conveyed to hot storage bins or silos until it can be loaded into trucks for transport off site.

The applicant has proposed that line power will be used exclusively at the facility. Therefore, no IC engines powering electrical generators were included in the application.

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).

October 9, 2020	P-2008.0058, Permit to Construct Name Change, Permit status (A but will become S upon issuance of this permit)
December 13, 2013	P-2008.0058, Permit to Construct transfer of Ownership, Permit status (S)
June 24, 2009	P-2008.0058, Initial Permit to Construct, Permit status (S)

Application Scope

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

The applicant has proposed asphalt production at a specific site. The location of the specific site is physical address. The material throughput limits are currently permitted. The only change from the current permit to this permitting action is, the boiler at the specific site is 2.5 MMBtu/hr and not 2.0 MMBtu/hr, the drum dryer shall use RF04 used oil, LPG, and natural gas, the asphaltic oil tank heater shall use distillate fuel with 0.0015% by weight, natural gas, and LPG, and the annual hours have been modeled at 8,760 hours per year to eliminate annual fuel use recordkeeping.

Application Chronology

January 27, 2021	DEQ received an application.
February 1, 2021	DEQ received an application and processing fee.
February 2 – February 17, 2021	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
February 16, 2021	DEQ determined that the application was complete.
April 7, 2021	DEQ made available the draft permit and statement of basis for peer and regional office review.
April 15, 2021	DEQ made available the draft permit and statement of basis for applicant review.
May 4, 2021	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

The asphalt production facility utilizes a baghouse for control of particulate matter emissions from the asphalt drum mixer. In addition, the applicant will maintain the moisture content in ¼" or smaller aggregate material at 1.5% by weight, using water sprays, using shrouds, or will use other emissions controls to minimize PM_{10} emissions from aggregate handling.

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Permit Section	Source Description	Emissions Control
2	Material Transfer Points: Materials handling Asphalt aggregate transfers Truck unloading of aggregate Aggregate conveyor transfers Aggregate handling	Maintaining the moisture content in ¼" or smaller aggregate material at 1.5% by weight, using water sprays, using shrouds, or other emissions controls
3	Asphalt Drum Mixer: Manufacturer: ADM Model: MM225 Type: Counter-flow Manufacture Date: 2008 Max. production: 225 T/hr, 5,400 T/day, and 270,000 T/yr Burner Rating: 75 MMBtu/hr Fuel(s): Natural gas, distillate fuel oil, used oil (RFO), and propane Liquid fuel sulfur content: 0.5% by weight	Asphalt Drum Mixer Baghouse: Manufacturer: ADM Model: BHP-585-9 Type: Pulse-jet PM_{10} control efficiency: 99.5%
	Asphaltic Oil Tank Heater: Heat input rating: 2.0 MMBtu/hr Fuel(s): Distillate fuel oil Liquid fuel sulfur content: 0.5% by weight Asphaltic Oil Tank Heater (Site Specific – Add Address): Heat input rating: 2.5 MMBtu/hr Fuel(s): Used Oil/RF04 Oil, Distillate Fuel Oil, Natural Gas/LNG, LPG/Propane Liquid fuel sulfur content: 0.1% by weight	N/A
	Fuel Oil Storage Tank(s) Tank 1: 20,000-gallon capacity, above-ground tank Tank 2: 44,000-gallon capacity, above-ground tank	

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.

Using this definition of Potential to Emit an emission inventory was developed for the site specific asphalt production operations at the facility associated with this proposed project using the DEQ developed HMA EI spreadsheet (see Appendix A). Emissions estimates of criteria pollutant PTE were based on the following assumptions:

- Maximum asphalt throughput does not exceed 225 ton HMA/hour, 5,400 ton HMA/day, and 270,000 ton HMA/year (per the applicant).

- Emissions from the asphalt drum dryer were based on the maximum emissions from using any of the proposed fuels for combustion in the drum dryer.
- Emissions from a portable rock crusher were included in the emissions modeling analysis with the assumption that when the collocated rock crusher is operating, the asphalt plant is operating at half its maximum capacity.
- Any emissions unit outside a 1,000 ft radius from the asphalt plant was not included in the emissions modeling analysis for this project.

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 presents the post project uncontrolled emissions for regulated air pollutants as submitted by the applicant and verified by DEQ staff. Uncontrolled emissions were determined as follows:

- For the asphalt drum mixer uncontrolled emissions were assumed to be based upon four times the proposed annual throughput (4 x 270,000 T/yr = 1,080,000 T/yr).
- For the asphaltic oil tank heater controlled emissions were scaled up from 6,000 hours per year of permitted operation (as proposed by the applicant) to 8,760 hours per year for full-time operation.
- For the materials handling operation controlled and uncontrolled emissions were assumed to be equal.

The following table presents the uncontrolled Potential to Emit for criteria pollutants as calculated per the DEQ HMA EI spreadsheet. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions Unit	$PM_{10}/PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2e
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources						
Asphalt drum mixer	12.42	48.06	29.70	70.20	17.28	51,197.42
Asphaltic oil tank heater	0.18	5.67	1.92	0.90	0.05	
Load-out and silo filling, and Materials Handling	0.60	0.00	0.00	1.37	2.18	
Total, Point Sources	**13.20**	**53.73**	**31.62**	**72.47**	**19.51**	**51,197.4**

The following table presents the uncontrolled Potential to Emit for HAP pollutants as calculated per the DEQ HMA EI spreadsheet. See Appendix A for a detailed presentation of the calculations emissions for each emissions unit. Worst-case HAPs emissions were based upon the same assumptions as for criteria pollutants.

Table 3 UNCONTROLLED POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS

IDAPA Listing	Hazardous Air Pollutants	Uncontrolled PTE (T/yr)
585	Dioxins	1.21E-07
	Furans	1.88E-07
	Acrolein	1.40E-02
	Antimony	5.17E-04
	Barium	3.34E-03
	Chromium	3.04E-03
	Cobalt	4.95E-04
	Copper	1.81E-03
	EthylBenzene	5.77E-06
	Hexane	5.16E-01
	Manganese	4.40E-03
	Methyl chloroform	2.59E-02
	Methyl ethyl ketone (MEK)	1.08E-02
	Molybdenum	6.29E-05
	Naphthalene	3.52E-01
	Pentane	2.79E-02
	Phosphorus	1.59E-02
	Propionaldehyde	7.02E-02
	Quinone	8.64E-02
	Selenium	2.44E-04
	Silver	2.59E-04
	Thallium	2.21E-06
	Toluene	1.57E+00
	Vanadium	2.54E-03
	Xylene	1.08E-01
	Zinc	3.53E-02
586	Acetaldehyde	7.02E-01
	Arsenic	4.08E-04
	Benzene	2.11E-01
	Benzo(a)anthracene	1.13E-04
	Benzo(a)pyrene	5.30E-06
	Benzo(b)fluoranthene	6.20E-05
	Benzo(k)fluoranthene	2.22E-05
	Beryllium	2.22E-06
	Cadmium	2.53E-04
	Chrysene	9.72E-05
	Dibenzo(a,h)anthracene	1.29E-08
	Formaldehyde	1.67E+00
	Hexavalent Chromium	2.63E-04
	Indeno(1,2,3-cd)pyrene	3.80E-06
	3-Methylchloranthrene	1.93E-08
	Nickel	4.08E-02
Not listed	Acenaphthene	7.98E-04
	Acenaphthylene	1.19E-02
	Anthracene	1.69E-03
	Benzo(e)pyrene	5.94E-05
	Benzo(g,h,l)perylene	2.16E-05
	Dichlorobenzene	1.29E-05
	Fluoranthene	3.33E-04
	Fluorene	5.94E-03
	Isooctane	2.16E-02
	Mercury	1.41E-03
	2-Methylnaphthalene	9.18E-02
	Perylene	4.75E-06
	Phenanthrene	1.28E-02
	Pyrene	1.62E-03
	Total	**5.62**

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 from all emissions units at the facility as submitted by the applicant and verified by DEQ staff. See Appendix X for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 4 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions Unit	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2e
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	T/yr[(b)]
Asphalt drum mixer	5.18	3.11	13.05	7.83	12.38	7.43	29.25	17.55	7.20	4.32	0
Asphaltic oil tank heater	0.04	0.01	1.04	2.39	0.29	0.67	0.07	0.16	0.008	0.01	
Load-out and silo filling, and Material Handling	0.25	0.15	0.00	0.00	0.00	0.00	0.57	0.34	0.91	0.54	
Pre-Project Totals	**5.47**	**3.27**	**14.09**	**10.22**	**12.67**	**8.10**	**29.89**	**18.05**	**8.12**	**4.87**	**0.00**

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

Post Project Potential to Emit

The following table presents the post project Potential to Emit for criteria pollutants from all emissions units at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 5 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions Unit	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2e
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	T/yr[(b)]
Asphalt drum mixer	5.18	3.11	20.03	12.02	12.38	7.43	29.25	17.55	7.20	4.32	11,282.00
Asphaltic oil tank heater	0.04	0.12	1.30	3.78	0.43	1.28	0.20	0.60	0.01	0.03	
Load-out and silo filling	0.25	0.15	0.00	0.00	0.00	0.00	0.56	0.34	0.91	0.54	
Post Project Totals	**5.47**	**3.38**	**21.33**	**15.80**	**12.81**	**8.71**	**30.01**	**18.49**	**8.12**	**4.89**	**11,282.0**

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

As demonstrated in Tables 2 and 4, this facility has uncontrolled potential to emit for PM_{10}, SO_2, NO_X, CO, and VOC, and CO_2e emissions less than the Major Source threshold of 100 T/yr and 100,000 T/yr respectively and a controlled potential to emit for PM_{10}, SO_2, NO_X, CO, and VOC, and CO_2e emissions less than the Major Source threshold of 100 T/yr and 100,000 T/yr respectively. In addition, as demonstrated in Table 3, this facility has an uncontrolled potential to emit for HAP emissions less than the Major Source threshold of 10 T/yr for any one HAP and 25 T/y for all HAPs combined. Therefore, this facility is designated as a Minor facility.

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 6 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2e
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	T/yr
Pre-Project Potential to Emit	5.47	3.27	14.09	10.22	12.67	8.10	29.89	18.05	8.12	4.87	0
Post Project Potential to Emit	5.47	3.38	21.33	15.80	12.81	8.71	30.01	18..49	8.12	4.89	11,282.00
Changes in Potential to Emit	**0.00**	**0.11**	**7.24**	**5.58**	**0.14**	**0.61**	**0.12**	**0.44**	**0.00**	**0.02**	**11,282.0**

Non-Carcinogenic TAP Emissions

A summary of the estimated PTE emissions increase of non-carcinogenic toxic air pollutants (TAPs) is provided in the following table.

Table 7 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetone	0.00E-03	1.89E-01	0.1890	119	No
Acrolein	0.00E-03	5.85E-03	0.0059	0.017	No
Antimony	0.00E-03	1.04E-04	0.0001	0.033	No
Barium	0.00E-03	1.34E-03	0.0014	2	No
Carbon disulfide	0.00E-03	5.60E-04	0.0013	0.033	No
Chromium metal (II and III)	0.00E-03	1.25E-03	0.0013	0.033	No
Cobalt metal dust, and fume	0.00E-03	7.91E-05	0.0001	0.0033	No
Copper (fume)	0.00E-03	7.19E-04	0.0007	0.013	No
Crotonaldehyde	0.00E-03	1.94E-02	0.0194	0.38	No
Cumene	0.00E-03	1.03E-03	0.0010	16.3	No
EthylBenzene	0.00E-03	5.77E-02	0.0057	29	No
Ethyl chloride (Chloroethane)	0.00E-03	1.12E-04	0.0001	176	No
Heptane	0.00E-03	2.12E+00	2.1200	109	No
Hexane	0.00E-03	2.14E-01	0.2160	12	No
Manganese as Mn (fume)	0.00E-03	1.77E-03	0.0018	0.067	No
Mercury (alkyl compounds as Hg)	0.00E-03	5.86E-04	0.0006	0.001	No
Methyl chloride (Chloromethane)	0.00E-03	7.71E-04	0.0060	6.867	No
Methyl ethyl ketone (MEK)	0.00E-03	6.03E-03	0.0064	39.3	No
Molybdenum (soluble)	0.00E-03	9.57E-06	0.0009	0.333	No
Pentane	0.00E-03	4.25E-03	0.0065	118	No
Phenol	0.00E-03	9.05E-04	0.0293	1.27	No
Phosphorous	0.00E-03	6.42E-03	0.0360	0.007	No
Propionaldehyde	0.00E-03	2.93E-02	0.0001	0.0287	No
Quinone	0.00E-03	3.60E-02	0.0001	0.027	No
Selenium	0.00E-03	8.71E-05	0.0002	0.013	No
Silver as Ag (soluble)	0.00E-03	1.08E-04	0.0000	0.001	No
Styrene monomer	0.00E-03	2.16E-04	0.6560	6.67	No
Thallium	0.00E-03	9.23E-07	0.0000	0.007	No
Toluene	0.00E-03	6.56E-01	0.0006	25	No
Vanadium as V_2O_5, (respirable dust and fume)	0.00E-03	3.87E-04	0.0143	0.003	No
Xylene	0.00E-03	6.34E-02	0.063	29	No
Zinc metal	0.00E-03	1.41E-02	0.014	0.667	No

Some of the PTEs for non-carcinogenic TAPs were exceeded as a result of this project. Therefore, modeling is required for Vanadium and Phosphorous because the 24-hour average non-carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic TAPs is provided in the following table.

Table 8 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetaldehyde	**4.01E-02**	**4.01E-02**	**0.0000**	**3.0E-03**	**Yes**
Arsenic	**0.00E-03**	**3.33E-05**	**0.000041**	**1.5E-06**	**Yes**
Benzene	**1.20E-02**	**1.22E-02**	**0.0002**	**8.0E-04**	**Yes**
Beryllium and compounds	0.00E-03	3..38E-07	0.0000005	2.8E-05	No
Cadmium and compounds	**5.19E-04**	**1.75E-05**	**-0.0004730**	**3.7E-06**	**Yes**
Chromium (VI)	**4.73E-04**	**1.69E-05**	**-0.000455**	**5.6E-07**	**Yes**
Dichloromethane	0.00E-03	7.40E-06	0.000007	1.6E-03	No
Formaldehyde	**7.43E-02**	**2.70E-03**	**0.0241**	**5.1E-04**	**Yes**
Nickel	**7.72E-03**	**2.97E-03**	**-0.0042**	**2.7E-05**	**Yes**
PAHs Total	**2.72E-02**	**2.91E-02**	**0.0020**	**9.1E-05**	**Yes**
POM Total	**2.08E-05**	**5.31E-05**	**0.000033**	**2.0E-06**	**Yes**
Tetrachloroethylene	0.00E-03	7.21E-05	0.0001	1.3E-02	No

c) Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

Some of the PTEs for carcinogenic TAPs were exceeded as a result of this project. Therefore, modeling is required for Acetaldehyde, Arsenic, Benzene, Cadmium, Chromium (VI), Formaldehyde, Nickel, PAHs Total, and POM Total because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Post Project HAP Emissions

The following table presents the post project potential to emit for hazardous air pollutants (HAPs) pollutants from all emissions units at the facility/for the one unit being modified as submitted by the applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 9 POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS EMISSIONS

IDAPA Listing	Hazardous Air Pollutants	PTE (T/yr)
585	Dioxins	9.94E-09
	Furans	6.50E-09
	Acrolein	5.85E-03
	Antimony	1.04E-04
	Barium	1.34E-03
	Chromium	1.25E-03
	Cobalt	7.91E-05
	Copper	7.19E-04
	Ethyl benzene	5.77E-02
	Hexane	2.14E-01
	Manganese	1.77E-03
	Methyl ethyl ketone (MEK)	6.03E-03
	Molybdenum	9.57E-06
	Naphthalene	2.05E-02
	Pentane	4.25E-03
	Phosphorus	6.42E-03
	Propionaldehyde	2.93E-02
	Quinone	3.60E-02
	Selenium	8.71E-05
	Silver	1.08E-04
	Thallium	9.23E-07

IDAPA Listing	Hazardous Air Pollutants	PTE (T/yr)
	Toluene	6.56E-01
	Vanadium	3.87E-04
	Xylene	6.34E-02
	Zinc	1.41E-02
586	Acetaldehyde	4.01E-02
	Arsenic	3.33E-05
	Benzene	1.22E-02
	Benzo(a)anthracene	1.29E-05
	Benzo(a)pyrene	5.46E-07
	Benzo(b)fluoranthene	5.10E-06
	Benzo(k)fluoranthene	1.50E-06
	Beryllium	3.38E-07
	Cadmium	1.75E-05
	Chrysene	3.28E-05
	Dibenzo(a,h)anthracene	4.08E-08
	Formaldehyde	9.84E-02
	Hexavalent Chromium	1.69E-05
	Indeno(1,2,3-cd)pyrene	2.68E-07
	3-Methylchloranthrene	2.94E-09
	Nickel	2.97E-03
Not listed	Acenaphthene	1.14E-04
	Acenaphthylene	6.85E-04
	Anthracene	1.15E-04
	Benzo(e)pyrene	4.95E-06
	Benzo(g,h,l)perylene	1.43E-06
	Dichlorobenzene	1.96E-06
	Fluoranthene	3.63E-05
	Fluorene	4.99E-04
	Isooctane	9.03E-03
	Mercury	5.86E-04
	2-Methylnaphthalene	5.90E-03
	Perylene	4.93E-06
	Phenanthrene	9.94E-04
	Pyrene	1.43E-04
	Total	**1.29**

The estimated PTE for all federally listed HAPs combined is below 25 T/yr and no PTE for a federally listed HAP exceeds 10 T/yr. Therefore, this facility is not a Major Source for HAPs.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO, VOC, HAP, and TAP from this project were below applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

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

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

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

As a result of the ambient air quality impact analysis, as well as information submitted by the applicant for specific operating scenarios, the following conditions (along with corresponding monitoring and record keeping requirements) were placed in the permit:

- The Emissions Limits permit condition,
- The Asphalt Production Limits permit condition,
- The Reduced Asphalt Production Limits permit condition,
- The Allowable Raw Materials permit condition,
- The Asphalt Operation Setback Distance Requirements permit condition,

T-RACT Analysis

DEQ is satisfied that an asphalt plant adhering to the conditions of this permit will not exceed any applicable acceptable ambient concentration (AAC) or AAC for carcinogens (AACC) for TAPs, except those TAPs using T-RACT analysis to demonstrate pre-construction compliance. As described in the Emissions Inventories Section previously, most of the uncontrolled TAP emission rate estimates were found to be less than their corresponding emission screening level (EL) listed in Section 585-586 of IDAPA 58.01.01. For those TAPs, the requirements under Section 210.05 are met and no further procedures for demonstrating preconstruction compliance are required.

For the TAPs that exceed the EL in Section 585-586 of IDAPA 58.01.01, preconstruction compliance was demonstrated under the rules for toxic air pollutant reasonably available control technology (T-RACT) as specified in Sections 210.12-14 of IDAPA 58.01.01.

In accordance with IDAPA 58.01.01.210.12, the proposed T-RACT ambient concentrations at the point of compliance for each applicable TAP are less than, or equal to, the T-RACT ambient concentration (i.e., less than 10 times the applicable AACC listed in IDAPA 58.01.01.586).

In accordance with IDAPA 58.01.01.210.14, this T-RACT analysis included consideration of available control technologies and/or "The application of a design, equipment, work practice or operational requirement, or combination thereof", for compliance with the T-RACT requirements. This included a search of EPA's RACT, BACT, LAER Clearinghouse to identify available control technologies. To meet the T-RACT requirements, the permit requires the control measures determined to meet T-RACT as summarized in the following table. These control measure were selected based upon consideration of the technological feasibility for this process/operation, the economic feasibility, energy requirements, and environmental impacts.

For control technologies, the TAPs from this operation are categorized as follows:

- Metals: Arsenic; Cadmium, Chromium VI, and Nickel
- Organics and acids: PAHs, POM, dioxins/furans, hydrochloric acid, quinone, and acetaldehyde

Table 10 T-RACT CONTROL MEASURES

TAP	Proposed T-RACT Control Measures	Permit Conditions
Organics	Good maintenance practices for the control equipment (baghouse)	3.19
Metals	Fuel specifications Baghouse control of HMA drum mixer emissions Recycling of collected particulate back to the asphalt drum mixer	3.12 3.19 3.19
Formaldehyde	Use of a covered conveyor from the HMA drum mixer to the silo/load out to minimize off-gassing emissions	2.2

In accordance with IDAPA 58.01.01.210.12.d and 58.01.01.210.14.e, emission limits and other permit conditions for each T-RACT pollutant have been incorporated into the permit as summarized in the table above to assure that the facility will be operated in the manner described in the preconstruction compliance demonstration. A detailed T-RACT analysis is provided on the DEQ website.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Bonneville County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAPS (Total HAPs) has permitted emissions > 25 T/yr.

SM80 = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAPs.

SM = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAPs.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

Table 11 Regulated Air Pollutant Facility Classification

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	13.20	3.38	**100**	B
PM_{10}	13.20	3.38	**100**	B
$PM_{2.5}$	13.20	3.38	**100**	B
SO_2	53.73	15.80	**100**	B
NO_X	31.62	8.71	**100**	B
CO	72.47	18.49	**100**	B
VOC	19.51	4.89	**100**	B
HAP (single)	1.67	6.56E-01	**10**	B
Total HAPs	5.62	1.29	**25**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201……………………………Permit to Construct Required

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

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401……………………………Tier II Operating Permit

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

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625……………………………Visible Emissions

The sources of PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 3.5 and 4.4.

Fugitive Emissions (IDAPA 58.01.01.650)

IDAPA 58.01.01.650……………………………Rules for the Control of Fugitive Emissions

The sources of fugitive emissions at this facility are subject to the State of Idaho fugitive emissions standards. These requirements are assured by Permit Conditions 2.2, 2.3, and 2.10.

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.

This has previously been demonstrated. The material throughput is not changing in this permitting project, therefore this analysis was not warranted or conducted.

Rules for Control of Odors (IDAPA 58.01.01.775)

IDAPA 58.01.01.750…………………………… Rules for Control of Odors

Section 776.01 states that no person shall allow, suffer, cause, or permit the emission of odorous gases, liquids, or solids into the atmosphere in such quantities as to cause air pollution. These requirements are assured by Permit Conditions 2.6 and 2.9.

Rules for Control of Hot-Mix Asphalt Plants (IDAPA 58.01.01.805)

IDAPA 58.01.01.805…………………………… Rules for Control of Hot-Mix Asphalt Plants

The purpose of Sections 805 through 808 is to establish for hot-mix asphalt plants restrictions on the emission of particulate matter.

Section 806 states that no person shall cause, allow or permit a hot-mix asphalt plant to have particulate emissions which exceed the limits specified in Sections 700 through 703. As demonstrated previously, these requirements have been met by the proposed PM_{10} emissions rate (see Section on Particulate Matter – New Equipment Process Weight Limitations).

Section 807 states that in the case of more than one stack to a hot-mix asphalt plant, the emission limitation will be based on the total emission from all stacks. The proposed facility only has one stack for emissions from the asphalt drum dryer so there is no need to combine emissions limits from multiple stacks into one stack as required.

Section 808.01 requires fugitive emission controls as follows: No person shall cause, allow or permit a plant to operate that is not equipped with an efficient fugitive dust control system. The system shall be operated and maintained in such a manner as to satisfactorily control the emission of particulate material from any point other than the stack outlet.

Section 808.02 requires plant property dust controls as follows: The owner or operator of the plant shall maintain fugitive dust control of the plant premises and plant owned, leased or controlled access roads by paving, oil treatment or other suitable measures. Good operating practices, including water spraying or other suitable measures, shall be employed to prevent dust generation and atmospheric entrainment during operations such as stockpiling, screen changing and general maintenance.

These requirements are assured by Permit Conditions 2.1 and 2.2.

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

IDAPA 58.01.01.301…………………………… Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for PM_{10}, SO_2, NO_X, CO, VOC, and HAP 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)

Because the facility produces asphalt the following NSPS Subparts are applicable:

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

DEQ has been delegated authority to this subpart.

Those sections that are applicable are highlighted.

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

40 CFR 60.90, Applicability.

(a) The affected facility to which the provisions of this subpart apply is each hot mix asphalt facility. For the purpose of this subpart, a hot mix asphalt facility is comprised only of any combination of the following: dryers; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler, systems for mixing hot mix asphalt; and the loading, transfer, and storage systems associated with emission control systems.

The affected facility for this drum mix HMA plant includes the drum dryer and systems for loading, transferring, and storing aggregate and RAP.

(b) Any facility under paragraph (a) of this section that commences construction or modification after June 11, 1973, is subject to the requirements of this subpart.

The proposed HMA plant was manufactured in May 2008, and is therefore subject to Subpart I.

40 CFR 60.91, Definitions.

This section includes a single definition: *hot mix asphalt facility.*

40 CFR 60.92, Standard for Particulate Matter.

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

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

(2) Exhibit 20 percent opacity, or greater.

40 CFR 60.93, Test Methods and Procedures.

(a) In conducting the performance tests required in §60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in §60.8(b).

(b) The owner or operator shall determine compliance with the particulate matter standards in §60.92 as follows:

(1) Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf).

(2) Method 9 and the procedures in §60.11 shall be used to determine opacity.

40 CFR 60 Subpart Kb **Standards of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for which construction, reconstruction, or modification commenced after July 23, 1984.**

40 CFR 60.110b, Applicability and designation of affected facility

(a) Except as provided in paragraph (b) of this section, the affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.

(b) This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa.

The maximum true vapor pressure of distillate fuel oils ranges between 2 and 20 millimeters of mercury (0.27 to 2.7 kPa).2 The vapor pressure of used oils is typically lower than for distillate fuel oils. The fuel oil storage tanks at this HMA plant store liquids with a maximum true vapor pressure less than 3.5 kPa.

Fuel oil storage Tank 1 has a capacity of 20,000 gallons (about 75.7 m^3), and is not subject to Subpart Kb in accordance with 60.110b(b).

Fuel oil storage Tank 2 has a capacity of 44,000 gallons (about 167 m^3), and is not subject to Subpart Kb in accordance with 60.110b(b).

(c) [Reserved]

(d) This subpart does not apply to the following:

(1) Vessels at coke oven by-product plants.

(2) Pressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere.

(3) Vessels permanently attached to mobile vehicles such as trucks, railcars, barges, or ships.

Propane tanks are designed to operate at high pressures ranging from 10 psig to 200 psig (about 69 kPa to 1,380 kPa). Fuel oil storage Tank 2 has a capacity of 44,000 gallons (about 167 m^3), and is not subject to Subpart Kb in accordance with 60.110b(b).

http://www.propane101.com/regulators.htm

NESHAP Applicability (40 CFR 61)

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

GACT Applicability (40 CFR 63)

The facility is not subject to any NESHAP requirements in 40 CFR 63.

Permit Conditions Review

This section describes the permit conditions for this modified permit or only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action. The General Provisions have been updated to the current template.

Permit Condition 1.1 establishes the permit to construct scope.

This permit condition explains that this is a modified permit to construct to add site specific permit conditions for a portable asphalt production facility.

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2 OSHA Standard Analytical Methods, Petroleum Distillate Fractions, accessible at http://www.osha.gov/dts/sltc/methods/organic/org048/org048.html

Permit Condition, Table 1.1, provides a description of the purpose of the permit and the regulated sources, the process, and the control devices used at the facility.
The T/day has been fixed as it should have been 5,400 T/day on the existing permit. This was a typographical error. The 2.5 MMBtu/hr asphaltic oil tank heater was added only for the site specific location of 2821 W York Rd. Idaho Falls, ID 83402. If the facility is portable and moves from this site the asphaltic oil tank heater must be 2.00 MMBtu/hr as previously permitted. The 130 meter setback on the existing permit was modeled using the 2.00 MMBTU/hr. Therefore only the 2.5 MMBtu/hr asphaltic oil tank heater shall be used at this location.

Permit Condition 2.5 Non-attainment Area Operation

This permit condition was added from the current template to dis-allow the facility from moving to and operating in a non-attainment area.

Permit Condition 2.8 Collocation Demonstration Recordkeeping

This permit was added from the current template to demonstrate compliance with the collocation permit condition. This permit condition should have been added on the last revision, which incorporated the collocation with one rock crusher.

Permit Condition 2.10 Recordkeeping

This permit condition was added from the current template. It should have been added in the last revision. It will help the facility demonstrate compliance with the required permit conditions.

Permit Condition 3.3 Emission Limits

This permit condition was modified to account for the emission limits while located at 2821 W York Rd., Idaho Falls, ID 83402.

Permit Condition 3.7 Reduced Asphalt Production Limits

This permit condition was added to account for the reduced production limits while collocated with a rock crusher. This permit condition should have been added in the previous permit revision.

Permit Condition 3.8 Asphalt Tank Heater Operation Limits

This permit condition was modified to account for the annual operating hours while located at, 2821 W York Rd., Idaho Falls, ID 83402.

Permit Condition 3.10 Asphalt Operation Setback Distances Requirements

This permit previously states 130 feet. However, the modeling memo stated 130 meters. Therefore this permit condition was corrected to reflect 130 meters as 427 feet. This was a typographical error from the last permitting project and was corrected in this permitting project.

Permit Condition 3.12 Asphalt Drum Mixer Fuel Specifications

This permit condition was modified to account for the different fuels while located at, 2821 W York Rd., Idaho Falls, ID 83402.

Permit Condition 3.13 Asphaltic Oil Tank Heater Fuel Specifications

This permit condition was modified to account for the different fuels while located at, 2821 W York Rd., Idaho Falls, ID 83402.

Permit Condition 3.14 $PM_{2.5}$ and Opacity Performance Testing

This permit condition was added from the current template.

Permit Condition 3.15 $PM_{2.5}$ and Opacity Performance Testing Methods and Procedures

This permit condition was added from the current template.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there were no comments on the application and there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Hot Mix Asphalt EI Spreadsheet

Idaho Department of Environmental Quality, Air Quality Division, Boise, Idaho **Version 8/2/18**

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). If the engine is a "non-road" IC engine (thus not stationary), "0" should be selected for 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.
Engine Certification: Input whether or not the IC engine is certified, or is certfied to meet EPA Tier 1, Tier 2, Tier 3, Tier 4 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.	777-00430	Spreadsheet Date	4/27/2021 14:19
Permit No.	P-2008.0058	DEQ Version Date	8/2/2018
Facility Owner/Company Name:	Depatco Inc. - 00430		
Address:	730 N 1500 W		
City, State, Zip:	Orem, Utah 84057		
Facility Contact:	Kamren Garfield		
Contact Number/ e-mail:	1-801-802-6933/kgarfield@clydeinc.com		
		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	ADM/MM225	Distillate (#2) Fuel Oil	0
Rated heat input capacity, MMBtu/hr	75	Used Oil or RFO4 Oil	1
Drum Dryer Hourly HMA Production, Tons/hour	225	Natural Gas	1
Max Production Per day, Tons per day	5,400	LPG or Propane	1
Max Annual HMA Production, Tons/year	270,000	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)	1,200	#2 Fuel Oil Max Sulfur Content	0.0015%
		Used Oil/RFO4 Oil Max Sulfur Content	0.5000%
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	2.500	**Fuel Type(s)**	**Fuel Toggle**
Hours of operation per day	16	#2 Fuel Oil	1
Operation, days per year (DEQ Assumption)	365.00	Fuel oil sulfur content	0.500%
Max Hours of operation per year (DEQ Assumption)	5,840	Natural Gas	1

Asphaltic Oil Tank Heater Fuel Consumption Calculations	**#2 Fuel Oil**	**Natural Gas**
Heat Input Rating, MMBtu/hr	2.500	2.500
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]	18.24	2,451
Max Operational Hours per Year	5,840	5,840
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 Year Manufactured (yyyy)	XX	#2 Fuel Oil (Diesel)	1
IC Engine Max Rated Power (bhp)	0	Max Sulfur weight percentage	0.0015%
IC Engine Max Rated Capacity (kW)	0	Max Operational Hours/Day	24
		Max Operational Hours/Year	3,000
IC Engine 1 EPA Certification:	0	Calculated Max Fuel Use Rate, gal/hr	0.00
Not EPA-certified: Enter "0" (zero)		Calculated MMBtu/hr	0.00
Certified Tier I, Tier 2, Tier 3, or Tier 4: Enter 1, 2, 3, or 4 Certified "BLUE SKY" engine: Enter 5			

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 Year Manufactured (yyyy)	XX	#2 Fuel Oil (Diesel)	1
IC Engine Rated Capacity (bhp)	0	Max Sulfur weight percentage	0.0015%
IC Engine Max Rated Capacity (kW)	0	Max Operational Hours per Day	0
		Max Operational Hours per Year	0
IC Engine 2 EPA Certification:	0	Calculated Max Fuel Use Rate, gal/hr	0.00
Not EPA-certified: Enter "0" (zero)		Calculated MMBtu/hr	0.00
Certified Tier I, Tier 2, Tier 3, or Tier 4: Enter 1, 2, 3, or 4 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 conveyo
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% cor
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

Facility: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID:** **P-2008.0058** **777-00430**

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

Fuel Type Toggle = 1
Max Hourly Production 225 T/hr
Max Daily Production 5,400 Tons/day
Max Annual Production 270,000 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% = 1.00

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	7.43	4.46	
PM-10 (total) [b]	0.023	5.18	3.11	
PM-2.5 [b1]	0.0223	5.02	3.01	
CO [c]	0.13	29.25	17.55	
NOx [c]	0.055	12.38	7.43	
SO_2 [c]	0.089	20.03	12.02	
VOC [d]	0.032	7.20	4.32	
Lead	1.50E-05	3.38E-03	2.03E-03	
HCl [d,e]	0.00021	0.04725	2.84E-02	
Dioxins[e,f]				
2,3,7,8-TCDD	2.10E-13	4.73E-11	2.84E-11	**6.47E-12**
Total TCDD	9.30E-13	2.09E-10	1.26E-10	**2.87E-11**
1,2,3,7,8-PeCDD	3.10E-13	6.98E-11	4.19E-11	**9.55E-12**
Total PeCDD	2.20E-11	4.95E-09	2.97E-09	**6.78E-10**
1,2,3,4,7,8-HxCDD	4.20E-13	9.45E-11	5.67E-11	**1.29E-11**
1,2,3,6,7,8-HxCDD	1.30E-12	2.93E-10	1.76E-10	**4.01E-11**
1,2,3,7,8,9-HxCDD	9.80E-13	2.21E-10	1.32E-10	**3.02E-11**
Total HxCDD	1.20E-11	2.70E-09	1.62E-09	**3.70E-10**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	1.08E-09	6.48E-10	**1.48E-10**
Total HpCDD	1.90E-11	4.28E-09	2.57E-09	**5.86E-10**
Octa CDD	2.50E-11	5.63E-09	3.38E-09	**7.71E-10**
Total PCDD[h]	7.90E-11	1.78E-08	1.07E-08	**2.43E-09**
Furans[e,f]				
2,3,7,8-TCDF	9.70E-13	2.18E-10	1.31E-10	**2.99E-11**
Total TCDF	3.70E-12	8.33E-10	5.00E-10	**1.14E-10**
1,2,3,7,8-PeCDF	4.30E-12	9.68E-10	5.81E-10	**1.33E-10**
2,3,4,7,8-PeCDF	8.40E-13	1.89E-10	1.13E-10	**2.59E-11**
Total PeCDF	8.40E-11	1.89E-08	1.13E-08	**2.59E-09**
1,2,3,4,7,8-HxCDF	4.00E-12	9.00E-10	5.40E-10	**1.23E-10**
1,2,3,6,7,8-HxCDF	1.20E-12	2.70E-10	1.62E-10	**3.70E-11**
2,3,4,6,7,8-HxCDF	1.90E-12	4.28E-10	2.57E-10	**5.86E-11**
1,2,3,7,8,9-HxCDF	8.40E-12	1.89E-09	1.13E-09	**2.59E-10**
Total HxCDF	1.30E-11	2.93E-09	1.76E-09	**4.01E-10**
1,2,3,4,6,7,8-HpCDF	6.50E-12	1.46E-09	8.78E-10	**2.00E-10**
1,2,3,4,7,8,9-HpCDF	2.70E-12	6.08E-10	3.65E-10	**8.32E-11**
Total HpCDF	1.00E-11	2.25E-09	1.35E-09	**3.08E-10**
Octa CDF	4.80E-12	1.08E-09	6.48E-10	**1.48E-10**
Total PCDF[h]	4.00E-11	9.00E-09	5.40E-09	**1.23E-09**
Total PCDD/PCDF[h]	1.20E-10	2.70E-08	1.62E-08	**3.70E-09**
Non-PAH HAPs[f]				
Acetaldehyde[e]	1.30E-03	2.93E-01	1.76E-01	**4.01E-02**
Acrolein[e]	2.60E-05	5.85E-03	3.51E-03	5.85E-03
Benzene[e]	3.90E-04	8.78E-02	5.27E-02	**1.20E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	5.40E-02	3.24E-02	5.40E-02
Formaldehyde[e]	3.10E-03	6.98E-01	4.19E-01	**9.55E-02**
Hexane[e]	9.20E-04	2.07E-01	1.24E-01	2.07E-01
Isooctane	4.00E-05	9.00E-03	5.40E-03	9.00E-03
Methyl Ethyl Ketone[e]	2.00E-05	4.50E-03	2.70E-03	4.50E-03
Pentane[e]				
Propionaldehyde[e]	1.30E-04	2.93E-02	1.76E-02	2.93E-02
Quinone[e]	1.60E-04	3.60E-02	2.16E-02	3.60E-02
Methyl chloroform[e]	4.80E-05	1.08E-02	6.48E-03	1.08E-02
Toluene[e]	2.90E-03	6.53E-01	3.92E-01	6.53E-01
Xylene[e]	2.00E-04	4.50E-02	2.70E-02	4.50E-02
POM (7-PAH Group)		1.23E-04		**1.69E-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	3.83E-02	2.30E-02	**5.24E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	3.15E-04	1.89E-04	**4.32E-05**
Acenaphthylene	2.20E-05	4.95E-03	2.97E-03	**6.78E-04**
Anthracene	3.10E-06	6.98E-04	4.19E-04	**9.55E-05**
Benzo(a)anthracene	2.10E-07	4.73E-05	2.84E-05	**6.47E-06**
Benzo(a)pyrene[e]	9.80E-09	2.21E-06	1.32E-06	**3.02E-07**
Benzo(b)fluoranthene	1.00E-07	2.25E-05	1.35E-05	**3.08E-06**
Benzo(e)pyrene	1.10E-07	2.48E-05	1.49E-05	**3.39E-06**
Benzo(g,h,i)perylene	4.00E-08	9.00E-06	5.40E-06	**1.23E-06**
Benzo(k)fluoranthene	4.10E-08	9.23E-06	5.54E-06	**1.26E-06**
Chrysene	1.80E-07	4.05E-05	2.43E-05	**5.55E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	1.37E-04	8.24E-05	**1.88E-05**
Fluorene	1.10E-05	2.48E-03	1.49E-03	**3.39E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	1.58E-06	9.45E-07	**2.16E-07**
Naphthalene[e]	6.50E-04	1.46E-01	8.78E-02	**2.00E-02**
Perylene	8.80E-09	1.98E-06	1.19E-06	**2.71E-07**
Phenanthrene	2.30E-05	5.18E-03	3.11E-03	**7.09E-04**
Pyrene	3.00E-06	6.75E-04	4.05E-04	**9.25E-05**
Non-HAP Organic Compounds[f]				
Acetone[e]	8.30E-04	1.87E-01	1.12E-01	1.87E-01
Benzaldehyde	1.10E-04	2.48E-02	1.49E-02	2.48E-02
Butane	6.70E-04	1.51E-01	9.05E-02	1.51E-01
Butyraldehyde	1.60E-04	3.60E-02	2.16E-02	3.60E-02
Crotonaldehyde[e]	8.60E-05	1.94E-02	1.16E-02	1.94E-02
Ethylene	7.00E-03	1.58E+00	9.45E-01	1.58E+00
Heptane	9.40E-03	2.12E+00	1.27E+00	2.12E+00
Hexanal	1.10E-04	2.48E-02	1.49E-02	2.48E-02
Isovaleraldehyde	3.20E-05	7.20E-03	4.32E-03	7.20E-03
2-Methyl-1-pentene	4.00E-03	9.00E-01	5.40E-01	9.00E-01
2-Methyl-2-butene	5.80E-04	1.31E-01	7.83E-02	1.31E-01
3-Methylpentane	1.90E-04	4.28E-02	2.57E-02	4.28E-02
1-Pentene	2.20E-03	4.95E-01	2.97E-01	4.95E-01
n-Pentane	2.10E-04	4.73E-02	2.84E-02	4.73E-02
Valeraldehyde[e]	6.70E-05	1.51E-02	9.05E-03	1.51E-02
Metals[g]				
Antimony[e]	1.80E-07	4.05E-05	2.43E-05	4.05E-05
Arsenic[e]	5.60E-07	1.26E-04	7.56E-05	**1.73E-05**
Barium[e]	5.80E-06	1.31E-03	7.83E-04	1.31E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	9.23E-05	5.54E-05	**1.26E-05**
Chromium[e]	5.50E-06	1.24E-03	7.43E-04	1.24E-03
Cobalt[e]	2.60E-08	5.85E-06	3.51E-06	5.85E-06
Copper[e]	3.10E-06	6.98E-04	4.19E-04	6.98E-04
Hexavalent Chromium[e]	4.50E-07	1.01E-04	6.08E-05	**1.39E-05**
Manganese[e]	7.70E-06	1.73E-03	1.04E-03	1.73E-03
Mercury[e]	2.60E-06	5.85E-04	3.51E-04	5.85E-04
Molybdenum[e]				
Nickel[e]	6.30E-05	1.42E-02	8.51E-03	**1.94E-03**
Phosphorus[e]	2.80E-05	6.30E-03	3.78E-03	6.30E-03
Silver[e]	4.80E-07	1.08E-04	6.48E-05	1.08E-04
Selenium[e]	3.50E-07	7.88E-05	4.73E-05	7.88E-05
Thallium[e]	4.10E-09	9.23E-07	5.54E-07	9.23E-07
Vanadium[e]				
Zinc[e]	6.10E-05	1.37E-02	8.24E-03	1.37E-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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/ Facility ID: P-2008.0058 777-00430**

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

Fuel Type Toggle =	1	
Max Hourly Production	225	Tons/hr
Max Daily Production	5,400	Tons/day
Max Annual Production	270,000	Tons/yr (Proposed Throughput Limit)

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total)[b]	0.033	7.43	4.46	
PM-10 (total)[b]	0.023	5.18	3.11	
PM-2.5 [b1]	0.0223	5.02	3.01	
CO [c]	0.13	29.25	17.55	
NOx [c]	0.026	5.85	3.51	
SO_2 [c]	0.0034	0.77	0.46	
VOC [d]	0.032	7.20	4.32	
Lead	6.20E-07	1.40E-04	8.37E-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	8.78E-02	5.27E-02	**1.20E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	5.40E-02	3.24E-02	5.40E-02
Formaldehyde[e]	3.10E-03	6.98E-01	4.19E-01	**9.55E-02**
Hexane[e]	9.20E-04	2.07E-01	1.24E-01	2.07E-01
Isooctane	4.00E-05	9.00E-03	5.40E-03	9.00E-03
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	1.08E-02	6.48E-03	1.08E-02
Toluene[e]	1.50E-04	3.38E-02	2.03E-02	3.38E-02
Xylene[e]	2.00E-04	4.50E-02	2.70E-02	4.50E-02
POM (7-PAH Group)		2.55E-02		**3.50E-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	1.67E-02	9.99E-03	**2.28E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	3.15E-04	1.89E-04	**4.32E-05**
Acenaphthylene	8.60E-06	1.94E-03	1.16E-03	**2.65E-04**
Anthracene	2.20E-07	4.95E-05	2.97E-05	**6.78E-06**
Benzo(a)anthracene	2.10E-07	4.73E-05	2.84E-05	**6.47E-06**
Benzo(a)pyrene[e]	9.80E-09	2.21E-06	1.32E-06	**3.02E-07**
Benzo(b)fluoranthene	1.00E-07	2.25E-05	1.35E-05	**3.08E-06**
Benzo(e)pyrene	1.10E-07	2.48E-05	1.49E-05	**3.39E-06**
Benzo(g,h,I)perylene	4.00E-08	9.00E-06	5.40E-06	**1.23E-06**
Benzo(k)fluoranthene	4.10E-08	9.23E-06	5.54E-06	**1.26E-06**
Chrysene	1.80E-07	4.05E-05	2.43E-05	**5.55E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	1.37E-04	8.24E-05	**1.88E-05**
Fluorene	3.80E-06	8.55E-04	5.13E-04	**1.17E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	1.58E-06	9.45E-07	**2.16E-07**
Naphthalene[e]	9.00E-05	2.03E-02	1.22E-02	**2.77E-03**
Perylene	8.80E-09	1.98E-06	1.19E-06	**2.71E-07**
Phenanthrene	7.60E-06	1.71E-03	1.03E-03	**2.34E-04**
Pyrene	5.40E-07	1.22E-04	7.29E-05	**1.66E-05**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	1.51E-01	9.05E-02	1.51E-01
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	1.58E+00	9.45E-01	1.58E+00
Heptane	9.40E-03	2.12E+00	1.27E+00	2.12E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	9.00E-01	5.40E-01	9.00E-01
2-Methyl-2-butene	5.80E-04	1.31E-01	7.83E-02	1.31E-01
3-Methylpentane	1.90E-04	4.28E-02	2.57E-02	4.28E-02
1-Pentene	2.20E-03	4.95E-01	2.97E-01	4.95E-01
n-Pentane	2.10E-04	4.73E-02	2.84E-02	4.73E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	4.05E-05	2.43E-05	4.05E-05
Arsenic[e]	5.60E-07	1.26E-04	7.56E-05	**1.73E-05**
Barium[e]	5.80E-06	1.31E-03	7.83E-04	1.31E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	9.23E-05	5.54E-05	**1.26E-05**
Chromium[e]	5.50E-06	1.24E-03	7.43E-04	1.24E-03
Cobalt[e]	2.60E-08	5.85E-06	3.51E-06	5.85E-06
Copper[e]	3.10E-06	6.98E-04	4.19E-04	6.98E-04
Hexavalent Chromium[e]	4.50E-07	1.01E-04	6.08E-05	**1.39E-05**
Manganese[e]	7.70E-06	1.73E-03	1.04E-03	1.73E-03
Mercury[e]	2.40E-07	5.40E-05	3.24E-05	5.40E-05
Molybdenum[e]				
Nickel[e]	6.30E-05	1.42E-02	8.51E-03	**1.94E-03**
Phosphorus[e]	2.80E-05	6.30E-03	3.78E-03	6.30E-03
Silver[e]	4.80E-07	1.08E-04	6.48E-05	1.08E-04
Selenium[e]	3.50E-07	7.88E-05	4.73E-05	7.88E-05
Thallium[e]	4.10E-09	9.23E-07	5.54E-07	9.23E-07
Vanadium[e]				
Zinc[e]	6.10E-05	1.37E-02	8.24E-03	1.37E-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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID: P-2008.0058 777-00430**

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

Fuel Type Toggle =	0	
Hourly Production	225	T/hr
Daily Production	5,400	Tons/day
Max Annual Production	270,000	Tons/yr

User Input Weight % Sulfur = 0.0015%
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% = 0.003

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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/ Facility ID: P-2008.0058 777-00430**

LPG or Propane Fired Drum Mix Asphalt Plant With Fabric Filter

Fuel Type Toggle = 1
Max Hourly Production 225 Tons/hr
Max Daily Production 5,400 Tons/day
Max Annual Production 270,000 Tons/yr

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

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total)[b]	0.033	7.43	4.46	
PM-10 (total)[b]	0.023	5.18	3.11	
PM-2.5 [b1]	0.0223	5.02	3.01	
CO [c]	0.13	29.25	17.55	
NOx [c1] (Natural Gas EF x 1.5)	0.039	8.78	5.27	
SO_2 [c]	0.0034	0.77	0.46	
VOC [d]	0.032	7.20	4.32	
Lead	6.20E-07	0.0001395	8.37E-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	8.78E-02	5.27E-02	**1.20E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	5.40E-02	3.24E-02	5.40E-02
Formaldehyde[e]	3.10E-03	6.98E-01	4.19E-01	**9.55E-02**
Hexane[e]	9.20E-04	2.07E-01	1.24E-01	2.07E-01
Isooctane	4.00E-05	9.00E-03	5.40E-03	9.00E-03
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	1.08E-02	6.48E-03	1.08E-02
Toluene[e]	1.50E-04	3.38E-02	2.03E-02	3.38E-02
Xylene[e]	2.00E-04	4.50E-02	2.70E-02	4.50E-02
POM (7-PAH Group)		1.23E-04		**1.69E-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	1.67E-02	9.99E-03	**2.28E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	3.15E-04	1.89E-04	**4.32E-05**
Acenaphthylene	8.60E-06	1.94E-03	1.16E-03	**2.65E-04**
Anthracene	2.20E-07	4.95E-05	2.97E-05	**6.78E-06**
Benzo(a)anthracene	2.10E-07	4.73E-05	2.84E-05	**6.47E-06**
Benzo(a)pyrene[e]	9.80E-09	2.21E-06	1.32E-06	**3.02E-07**
Benzo(b)fluoranthene	1.00E-07	2.25E-05	1.35E-05	**3.08E-06**
Benzo(e)pyrene	1.10E-07	2.48E-05	1.49E-05	**3.39E-06**
Benzo(g,h,l)perylene	4.00E-08	9.00E-06	5.40E-06	**1.23E-06**
Benzo(k)fluoranthene	4.10E-08	9.23E-06	5.54E-06	**1.26E-06**
Chrysene	1.80E-07	4.05E-05	2.43E-05	**5.55E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	1.37E-04	8.24E-05	**1.88E-05**
Fluorene	3.80E-06	8.55E-04	5.13E-04	**1.17E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	1.58E-06	9.45E-07	**2.16E-07**
Naphthalene[e]	9.00E-05	2.03E-02	1.22E-02	**2.77E-03**
Perylene	8.80E-09	1.98E-06	1.19E-06	**2.71E-07**
Phenanthrene	7.60E-06	1.71E-03	1.03E-03	**2.34E-04**
Pyrene	5.40E-07	1.22E-04	7.29E-05	**1.66E-05**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	1.51E-01	9.05E-02	1.51E-01
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	1.58E+00	9.45E-01	1.58E+00
Heptane	9.40E-03	2.12E+00	1.27E+00	2.12E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	9.00E-01	5.40E-01	9.00E-01
2-Methyl-2-butene	5.80E-04	1.31E-01	7.83E-02	1.31E-01
3-Methylpentane	1.90E-04	4.28E-02	2.57E-02	4.28E-02
1-Pentene	2.20E-03	4.95E-01	2.97E-01	4.95E-01
n-Pentane	2.10E-04	4.73E-02	2.84E-02	4.73E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	4.05E-05	2.43E-05	4.05E-05
Arsenic[e]	5.60E-07	1.26E-04	7.56E-05	**1.73E-05**
Barium[e]	5.80E-06	1.31E-03	7.83E-04	1.31E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	9.23E-05	5.54E-05	**1.26E-05**
Chromium[e]	5.50E-06	1.24E-03	7.43E-04	1.24E-03
Cobalt[e]	2.60E-08	5.85E-06	3.51E-06	5.85E-06
Copper[e]	3.10E-06	6.98E-04	4.19E-04	6.98E-04
Hexavalent Chromium[e]	4.50E-07	1.01E-04	6.08E-05	**1.39E-05**
Manganese[e]	7.70E-06	1.73E-03	1.04E-03	1.73E-03
Mercury[e]	2.40E-07	5.40E-05	3.24E-05	5.40E-05
Molybdenum[e]				
Nickel[e]	6.30E-05	1.42E-02	8.51E-03	**1.94E-03**
Phosphorus[e]	2.80E-05	6.30E-03	3.78E-03	6.30E-03
Silver[e]	4.80E-07	1.08E-04	6.48E-05	1.08E-04
Selenium[e]	3.50E-07	7.88E-05	4.73E-05	7.88E-05
Thallium[e]	4.10E-09	9.23E-07	5.54E-07	9.23E-07
Vanadium[e]				
Zinc[e]	6.10E-05	1.37E-02	8.24E-03	1.37E-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.

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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	18.24	gal/hr
Max Daily Operation	16	hr/day
Max Annual Operation	5,840	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	6.02E-02	0.18	
PM-10 (total) [b] (filterable+cond)	0.0023	4.20E-02	0.12	
PM-2.5 (total) [b] (filterable+cond)	0.00154	0.028	0.08	
CO [b] ("C" EF Rating Factor)	0.005	9.12E-02	0.27	
NOx [b]	0.024	4.38E-01	1.28	
SO_2 [b]	0.071	1.30	3.78	
VOC [d] (NMTOC EF)	5.56E-04	1.01E-02	2.96E-02	
Lead[f]	1.51E-06	2.75E-05	8.04E-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	1.26E-11	3.68E-11	**8.39E-12**
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]	7.60E-13	1.39E-11	4.05E-11	**9.24E-12**
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]	1.50E-11	2.74E-10	7.99E-10	**1.82E-10**
Total HpCDD[c]	2.00E-11	3.65E-10	1.07E-09	**2.43E-10**
Octa CDD[c]	1.60E-10	2.92E-09	8.52E-09	**1.95E-09**
Total PCDD[c]	2.00E-10	3.65E-09	1.07E-08	**2.43E-09**
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]	3.30E-12	6.02E-11	1.76E-10	**4.01E-11**
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]	4.80E-13	8.76E-12	2.56E-11	**5.84E-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	3.65E-11	1.07E-10	**2.43E-11**
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]	9.70E-12	1.77E-10	5.17E-10	**1.18E-10**
Octa CDF[c]	1.20E-11	2.19E-10	6.39E-10	**1.46E-10**
Total PCDF[c]	3.10E-11	5.66E-10	1.65E-09	**3.77E-10**
Total PCDD/PCDF[c]	2.30E-10	4.20E-09	1.23E-08	**2.80E-09**
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	3.50E-06	6.39E-05	1.86E-04	**4.26E-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)		1.82E-06		**1.22E-06**

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	9.67E-06	2.82E-05	**6.45E-06**
Acenaphthylene[c]	2.00E-07	3.65E-06	1.07E-05	**2.43E-06**
Anthracene[c]	1.80E-07	3.28E-06	9.59E-06	**2.19E-06**
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene[c]	1.00E-07	1.82E-06	5.33E-06	**1.22E-06**
Benzo(e)pyrene				
Benzo(g,h,l)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a.h)anthracene				
Dichlorobenzene				
Fluoranthene[c]	4.40E-08	8.03E-07	2.34E-06	**5.35E-07**
Fluorene[c]	3.20E-08	5.84E-07	1.70E-06	**3.89E-07**
Indeno(1,2,3-cd)pyrene				
Naphthalene[c,e]	1.70E-05	3.10E-04	9.06E-04	**2.07E-04**
Perylene				
Phenanthrene[c]	4.90E-06	8.94E-05	2.61E-04	**5.96E-05**
Pyrene[c]	3.20E-08	5.84E-07	1.70E-06	**3.89E-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	9.58E-05	2.80E-04	6.39E-05
Arsenic[e]	1.32E-06	2.41E-05	7.03E-05	**1.61E-05**
Barium[e]	2.57E-06	4.69E-05	1.37E-04	3.13E-05
Beryllium[e]	2.78E-08	5.07E-07	1.48E-06	**3.38E-07**
Cadmium[e]	3.98E-07	7.26E-06	2.12E-05	**4.84E-06**
Chromium[e]	8.45E-07	1.54E-05	4.50E-05	1.03E-05
Cobalt[e]	6.02E-06	1.10E-04	3.21E-04	7.32E-05
Copper[e]	1.76E-06	3.21E-05	9.38E-05	2.14E-05
Hexavalent Chromium[e]	2.48E-07	4.52E-06	1.32E-05	**3.02E-06**
Manganese[e]	3.00E-06	5.47E-05	1.60E-04	3.65E-05
Mercury[e]	1.13E-07	2.06E-06	6.02E-06	1.37E-06
Molybdenum[e]	7.87E-07	1.44E-05	4.19E-05	9.57E-06
Nickel[e]	8.45E-05	1.54E-03	4.50E-03	**1.03E-03**
Phosphorus[e]	9.46E-06	1.73E-04	5.04E-04	1.15E-04
Silver[e]				
Selenium[e]	6.83E-07	1.25E-05	3.64E-05	8.31E-06
Thallium[e]				
Vanadium[e]	3.18E-05	5.80E-04	1.69E-03	3.87E-04
Zinc[e]	2.91E-05	5.31E-04	1.55E-03	3.54E-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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID: P-2008.0058 777-00430**

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	2,451	scf/hr
Max Daily Operation	16	hr/day
Max Annual Operation	5,840	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**	2.18E-02	6.37E-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	6.37E-05	1.86E-04	**4.25E-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,l)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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID: P-2008.0058 777-00430**

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

Fuel Type Toggle =	1	
Fuel Consumption Rate	2,451	scf/hr
Max Daily Operation	16	hr/day
Max Annual Operation	5,840	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	1.86E-02	5.44E-02	
PM-10 (total)[c]	7.6	1.86E-02	5.44E-02	
PM-2.5	7.6	1.86E-02	5.44E-02	
CO[b]	**84**	2.06E-01	6.01E-01	
NOx[b]	100	2.45E-01	7.16E-01	
SO_2[c]	0.6	1.47E-03	4.29E-03	
VOC[c]	5.5	1.35E-02	3.94E-02	
Lead[c]	5.00E-04	1.23E-06	3.58E-06	
HCl[e]				
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[c1, e]	2.10E-03	5.15E-06	1.50E-05	**3.43E-06**
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[e]	7.50E-02	1.84E-04	5.37E-04	**1.23E-04**
Hexane[e]	1.80E+00	4.41E-03	1.29E-02	2.94E-03
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[c1, e]	2.60E+00	6.37E-03	1.86E-02	4.25E-03
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c1, e]	3.40E-03	8.33E-06	2.43E-05	5.56E-06
Xylene[e]				
POM (7-PAH Group)		2.79E-08		**1.86E-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	5.88E-08	1.72E-07	**3.92E-08**
3-Methylchloranthrene[c1, e]	1.80E-06	4.41E-09	1.29E-08	**2.94E-09**
Acenaphthene[c1]	1.80E-06	4.41E-09	1.29E-08	**2.94E-09**
Acenaphthylene[c1]	1.80E-06	4.41E-09	1.29E-08	**2.94E-09**
Anthracene[c1]	2.40E-06	5.88E-09	1.72E-08	**3.92E-09**
Benzo(a)anthracene[c1]	1.80E-06	4.41E-09	1.29E-08	**2.94E-09**
Benzo(a)pyrene[c1, e]	1.20E-06	2.94E-09	8.59E-09	**1.96E-09**
Benzo(b)fluoranthenec[1]	1.80E-06	4.41E-09	1.29E-08	**2.94E-09**
Benzo(e)pyrene				
Benzo(g,h,l)perylene[c1]	1.20E-06	2.94E-09	8.59E-09	**1.96E-09**
Benzo(k)fluoranthene[c1]	1.80E-06	4.41E-09	1.29E-08	**2.94E-09**
Chrysene[c1]	1.80E-06	4.41E-09	1.29E-08	**2.94E-09**
Dibenzo(a,h)anthracene[c1]	1.20E-06	2.94E-09	8.59E-09	**1.96E-09**
Dichlorobenzene[c1]	1.20E-03	2.94E-06	8.59E-06	**1.96E-06**
Fluoranthene[c1]	3.00E-06	7.35E-09	2.15E-08	**4.90E-09**
Fluorene[c1]	2.80E-06	6.86E-09	2.00E-08	**4.58E-09**
Indeno(1,2,3-cd)pyrene[c1]	1.80E-06	4.41E-09	1.29E-08	**2.94E-09**
Naphthalene[c1, e]	6.10E-04	1.50E-06	4.37E-06	**9.97E-07**
Perylene				
Phenanthrene[c1]	1.70E-05	4.17E-08	1.22E-07	**2.78E-08**
Pyrene[c1]	5.00E-06	1.23E-08	3.58E-08	**8.17E-09**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane[c1]	2.10E+00	5.15E-03	1.50E-02	3.43E-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	4.90E-07	1.43E-06	**3.27E-07**
Barium[d,e]	4.40E-03	1.08E-05	3.15E-05	7.19E-06
Beryllium[e]	1.20E-05	2.94E-08	8.59E-08	**1.96E-08**
Cadmium[d,e]	1.10E-03	2.70E-06	7.87E-06	**1.80E-06**
Chromium[d,e]	1.40E-03	3.43E-06	1.00E-05	2.29E-06
Cobalt[d,e]	8.40E-05	2.06E-07	6.01E-07	1.37E-07
Copper[d,e]	8.50E-04	2.08E-06	6.08E-06	1.39E-06
Hexavalent Chromium[e]				
Manganese[d,e]				
Mercury[d,e]				
Molybdenum[d,e]	1.10E-03	2.70E-06	7.87E-06	1.80E-06
Nickel[d,e]				
Phosphorus[e]				
Silver[e]				
Selenium[d,e]				
Thallium[e]				
Vanadium[d,e]	2.30E-03	5.64E-06	1.65E-05	3.76E-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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID: P-2008.0058 777-00430**

Silo Filling Operations AP-42 Section 11.1

Emissions Toggle =	1	
Max Hourly Production	225	T/hr
Max Daily Production	5,400	Tons/day
Max Annual Production	270,000	Tons/yr

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total) [b]	5.86E-04	0.1318	0.0791	
PM-10 (total) [b]	5.86E-04	0.1318	0.0791	
PM-2.5 [b]	5.86E-04	0.1318	0.0791	
CO [b]	1.18E-03	0.2655	0.1593	
NOx				
SO_2				
VOC [d,g]	1.22E-04	2.74E-02	0.0165	
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	8.77E-04	5.26E-04	0.0001
1,3-Butadiene[e]				
Ethylbenzene[e]	4.63E-06	1.04E-03	6.25E-04	1.04E-03
Formaldehyde[e]	8.41E-05	1.89E-02	1.14E-02	0.0026
Hexane[e]	1.22E-05	2.74E-03	1.65E-03	2.74E-03
Isooctane	3.78E-08	8.50E-06	5.10E-06	8.50E-06
Methyl Ethyl Ketone[e]	4.75E-06	1.07E-03	6.42E-04	1.07E-03
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]		0.00E+00	0.00E+00	
Toluene[e]	7.56E-06	1.70E-03	1.02E-03	1.70E-03
Xylene[e]	3.13E-05	7.05E-03	4.23E-03	7.05E-03
POM (7-PAH Group)		1.52E-04		**2.08E-05**

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	1.34E-05	3.01E-03	1.81E-03	4.12E-04
3-Methylchloranthrene[e]				
Acenaphthene	1.19E-06	2.68E-04	1.61E-04	3.68E-05
Acenaphthylene	3.55E-08	8.00E-06	4.80E-06	1.10E-06
Anthracene	3.30E-07	7.43E-05	4.46E-05	1.02E-05
Benzo(a)anthracene	1.42E-07	3.20E-05	1.92E-05	4.38E-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	5.43E-06	3.26E-06	7.43E-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	1.20E-04	7.20E-05	1.64E-05
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene				
Fluoranthene	3.81E-07	8.57E-05	5.14E-05	1.17E-05
Fluorene	2.56E-06	5.77E-04	3.46E-04	7.90E-05
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene[e]	4.62E-06	1.04E-03	6.24E-04	1.42E-04
Perylene	7.62E-08	1.71E-05	1.03E-05	2.35E-06
Phenanthrene	4.57E-06	1.03E-03	6.17E-04	1.41E-04
Pyrene	1.12E-06	2.51E-04	1.51E-04	3.44E-05
Non-HAP Organic Compounds				
Acetone[e]	6.70E-06	1.51E-03	0.0009	1.51E-03
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	1.34E-04	3.02E-02	0.0181	3.02E-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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID: P-2008.0058 777-00430**

Silo Filling Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle = 0
Max Hourly Production 225 T/hr
Max Daily Production 5,400 Tons/day
Max Annual Production 270,000 Tons/yr

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
non-PAH HAPs[g]				
Bromomethane[e]	5.97E-07	1.34E-04	0.0001	1.34E-04
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	1.95E-06	4.39E-04	0.0003	4.39E-04
Chloroethane (Ethyl chloride[e])	4.87E-07	1.10E-04	0.0001	1.10E-04
Chloromethane (Methyl chloride[e])	2.80E-06	6.31E-04	0.0004	6.31E-04
Cumene[e]				
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	3.29E-08	7.40E-06	4.44E-06	7.40E-06
MTBE				
Styrene[e]	6.58E-07	1.48E-04	8.88E-05	1.48E-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	5.48E-03	0.0033	5.48E-03
o-Xylene[e] (added into Xylene[e])	6.95E-06	1.56E-03	0.0009	1.56E-03
Phenol[e,f]				
Non-HAP Organic Compounds				
Methane	3.17E-03	7.13E-01	0.4278	7.13E-01

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

Facility: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID: P-2008.0058 777-00430**

Load-out Operations AP-42 Section 11.1

Emissions Toggle =	1	
Max Hourly Production	225	T/hr
Max Daily Production	5,400	Tons/day
Max Annual Production	270,000	Tons/yr

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total) [b]	5.22E-04	0.117	0.07	
PM-10 (total) [b]	5.22E-04	0.117	0.07	
PM-2.5 [b]	5.22E-04	0.117	0.07	
CO [b]	1.35E-03	0.304	0.18	
NOx				
SO_2				
VOC [d,g]	3.91E-03	0.880	0.53	
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	4.87E-04	2.92E-04	**6.67E-05**
1,3-Butadiene[e]				
Ethylbenzene[e]	1.16E-05	2.62E-03	1.57E-03	2.62E-03
Formaldehyde[e]	3.66E-06	8.23E-04	4.94E-04	**1.13E-04**
Hexane[e]	6.24E-06	1.40E-03	8.42E-04	1.40E-03
Isooctane	7.49E-08	1.68E-05	1.01E-05	1.68E-05
Methyl Ethyl Ketone[e]	2.04E-06	4.59E-04	2.75E-04	4.59E-04
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]	8.73E-06	1.97E-03	1.18E-03	1.97E-03
Xylene[e]	5.03E-05	1.13E-02	6.79E-03	1.13E-02
POM (7-PAH Group)		1.04E-04		**1.42E-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	1.83E-03	1.10E-03	**2.50E-04**
3-Methylchloranthrene[e]				
Acenaphthene	8.86E-07	1.99E-04	1.20E-04	**2.73E-05**
Acenaphthylene	9.55E-08	2.15E-05	1.29E-05	**2.94E-06**
Anthracene	2.39E-07	5.37E-05	3.22E-05	**7.36E-06**
Benzo(a)anthracene	6.48E-08	1.46E-05	8.75E-06	**2.00E-06**
Benzo(a)pyrene[e]	7.84E-09	1.76E-06	1.06E-06	**2.42E-07**
Benzo(b)fluoranthene	2.59E-08	5.83E-06	3.50E-06	**7.99E-07**
Benzo(e)pyrene	2.66E-08	5.98E-06	3.59E-06	**8.20E-07**
Benzo(g,h,l)perylene	6.48E-09	1.46E-06	8.75E-07	**2.00E-07**
Benzo(k)fluoranthene	7.50E-09	1.69E-06	1.01E-06	**2.31E-07**
Chrysene	3.51E-07	7.90E-05	4.74E-05	**1.08E-05**
Dibenzo(a,h)anthracene	1.26E-09	2.84E-07	1.70E-07	**3.89E-08**
Dichlorobenzene				
Fluoranthene	1.70E-07	3.84E-05	2.30E-05	**5.25E-06**
Fluorene	2.63E-06	5.91E-04	3.54E-04	**8.09E-05**
Indeno(1,2,3-cd)pyrene	1.60E-09	3.61E-07	2.16E-07	**4.94E-08**
Naphthalene[e]	4.26E-06	9.59E-04	5.75E-04	**1.31E-04**
Perylene	7.50E-08	1.69E-05	1.01E-05	**2.31E-06**
Phenanthrene	2.76E-06	6.21E-04	3.73E-04	**8.51E-05**
Pyrene	5.11E-07	1.15E-04	6.90E-05	**1.58E-05**
Non-HAP Organic Compounds				
Acetone[e]	1.95E-06	4.38E-04	2.63E-04	4.38E-04
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	2.95E-05	6.64E-03	3.99E-03	6.64E-03
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-14, Predictive Emission Factor Equations for Load-Out and Silo Filling Operations, 3/04

Defaults: (-V) = 0.5 $T\ (^{o}F) =$ 325

Equation		**LOADOUT**	**SILO FILL**	
Total PM $EF = 0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ + $000332+ 0.00105(-V)e^{((0.0251)(T+460)-20.}$	=	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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID: P-2008.0058 777-00430**

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

Fuel Type Toggle =	0	
Max Hourly Production	225	T/hr
Max Daily Production	5,400	Tons/day
Max Annual Production	270,000	Tons/yr

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
non-PAH HAPs[g]				
Bromomethane[e]	3.99E-07	8.98E-05	5.39E-05	8.98E-05
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	5.41E-07	1.22E-04	7.30E-05	1.22E-04
Chloroethane (Ethyl chloride[e])	8.73E-09	1.97E-06	1.18E-06	1.97E-06
Chloromethane (Methyl chloride[e])	6.24E-07	1.40E-04	8.42E-05	1.40E-04
Cumene[e]	4.57E-06	1.03E-03	6.18E-04	1.03E-03
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])				
MTBE				
Styrene[e]	3.04E-07	6.83E-05	4.10E-05	6.83E-05
Tetrachloroethene (Tetrachloroethylene[e])	3.20E-07	7.21E-05	4.32E-05	7.21E-05
1,1,1-Trichloroethane (Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])				
Trichlorofluoromethane	5.41E-08	1.22E-05	7.30E-06	1.22E-05
m-/p-Xylene[e] (added into Xylene[e])	1.71E-05	3.84E-03	2.30E-03	3.84E-03
o-Xylene[e] (added into Xylene[e])	3.33E-05	7.49E-03	4.49E-03	7.49E-03
Phenol[e,f]	4.02E-06	9.05E-04	5.43E-04	9.05E-04
Non-HAP Organic Compounds				
Methane	2.70E-04	6.08E-02	3.65E-02	6.08E-02

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

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

Facility: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit P-2008.0058** **Facility ID: 777-00430**

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	3,000	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
Certified EPA Tier 4*:	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

**Tier 4 emission factors from https://www.epa.gov/sites/production/files/2018-02/documents/02-update-tier-4-nonroad-diesel-engines-2017-12-06.pdf and 40 CFR 1039.101*

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, 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	0.09
kW< 8	4	0	2008	---	*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	4	0	2008	---	*0.36*	1.76	1.55	0.09
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	---	*0.36*	1.76	1.29	0.07
19 < kW < 37	4	0	2013	---	*0.36*	1.10	1.29	0.01
19 ≤ kW < 37	BlueSky	0	n/a	---	*0.36*	1.06	*1.29*	0.085
37 ≤ kW < 56	1	0	1998	2.16	*0.36*	---	*0.95*	*0.31*
37 ≤ kW < 56	2	0	2004	---	*0.36*	1.76	1.17	0.09
37 ≤ kW < 56	3	0	2008	---	*0.36*	1.10	1.17	0.09
37 ≤ kW < 56	4	0	2008	---	*0.36*	1.10	1.17	0.07
37 ≤ kW < 56	4	0	2012	---	*0.36*	1.10	1.17	0.07
37 ≤ kW < 56	4	0	2013	---	*0.36*	1.10	1.17	0.01
37 ≤ kW < 56	BlueSky	0	n/a	---	0.36	1.10	*1.17*	0.056
56 ≤ kW < 75	1	0	1998	2.16	*0.36*	---	*0.95*	*0.31*
56 ≤ kW < 75	2	0	2004	---	*0.36*	1.76	1.17	0.09
56 ≤ kW < 75	3	0	2008	---	*0.36*	1.10	1.17	0.09
56 ≤ kW < 75	4	0	2012	---	0.04	0.80	1.17	0.005
56 ≤ kW < 75	4	0	2015	0.80	0.04	--	1.17	0.005
56 ≤ 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	4	0	2012	---	0.04	0.80	1.17	0.005
75 ≤ kW < 130	4	0	2015	0.80	0.04	--	1.17	0.005
75 ≤ kW < 130	BlueSky	0	n/a	---	*0.36*	0.94	1.17	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 < 225	4	0	2011	0.47	0.04	---	0.82	0.005
130 ≤ kW < 225	4	0	2014	0.47	0.04	---	0.82	0.005
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
225 ≤ kW < 450	4	0	2011	0.47	0.04	---	0.82	0.05
225 ≤ kW < 450	4	0	2014	0.47	0.04		0.82	0.05

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	4	0	2008	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	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	0.00
19 < kW < 37	4	0	2013	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 < 56	1	0	1998	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 56	2	0	2004	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 56	3	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 56	4	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 56	4	0	2012	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 56	4	0	2013	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 56	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
56 ≤ kW < 75	1	0	1998	0.00	0.00	0.00	0.00	0.00
56 ≤ kW < 75	2	0	2004	0.00	0.00	0.00	0.00	0.00
56 ≤ kW < 75	3	0	2008	0.00	0.00	0.00	0.00	0.00
56 ≤ kW < 75	4	0	2012	0.00	0.00	0.00	0.00	0.00
56 ≤ kW < 75	4	0	2015	0.00	0.00	0.00	0.00	0.00

Facility: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID: P-2008.0058 777-00430**

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

Fuel Type Toggle =	1	0 kw	User Input Weight % Sulfur = 0.0015%
Fuel Consumption Rate	0.00 gal/hr		AP-42 3.3 SO2 EF = 0.29 for #2 fuel oil, presumed max 0.5%
Calculated MMBtu/hr	0.000 MMBtu/hr		SO2 emissions are multiplied by a factor: User Input Value/0.5% = 0.00
Max Daily Operation	24 hr/day		Not an EPA-Certified Generator
Max Annual Operation	3,000 hrs/yr		

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,l)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: Sunroc Corporation dba Depatco I **Facility ID:** 777-00430
4/27/2021 14:19 **Permit** P-2008.0058

ERROR - GENERATOR RATING IS LESS THAN 447 kW

Rated Power (kW):	0
Not EPA Certified:	Yes
Certified EPA Tier 1:	No
Certified EPA Tier 2:	No
Certified EPA Tier 3:	No
Certified EPA Tier 4*	No
Blue Sky Engine:	No

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	0	hr/day
Max Annual Operation	0	hrs/yr

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

**Tier 4 emission factors from https://www.epa.gov/sites/production/files/2018-02/documents/02-update-tier-4-nonroad-diesel-engines-2017-12-06.pdf and 40 CFR 1039.101;Genset EF's*

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
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
225 ≤ kW < 450	4	0	2011	0.47	0.04	---	0.82	0.05
225 ≤ kW < 450	4	0	2014	0.47	0.04		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
450 ≤ kW ≤ 560	4	0	2011	0.47	0.04	---	0.82	0.005
450 ≤ kW ≤ 560	4	0	2014	0.47	0.04	---	0.82	0.005
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	4	0	2011	0.82	0.04	---	0.82	0.01
kW > 560*	4	0	2014	0.16	0.04	---	0.82	0.01
kW > 560	BlueSky	0	n/a	---	*0.31*	0.89	*0.82*	0.028

*Tier 4 final emission factors from 40 CFR 1039.101 for engines that are part of gensets

40 CFR 89, EPA CERTIFIED GENERATOR EMISSION FACTORS FOR GENERATOR G2 (lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM10
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
225 ≤ kW < 450	4	0	2011	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	4	0	2014	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
450 ≤ kW ≤ 560	4	0	2011	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	4	0	2014	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	4	0	2011	0.00	0.00	0.00	0.00	0.00
kW > 560	4	0	2015	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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID:** **P-2008.0058** **777-00430** **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 =	0.0015%
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	0 hr/day		Not an EPA-Certified Generator	
Max Annual Operation	0 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)	0.001515	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,l)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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID:** **P-2008.0058** **777-00430**

Max Hourly Production	225	T/hr	96%	T/hr is Aggregate & RAP =	**216 T/hr**
Max Daily Production	5,400	Tons/day	96%	T/day is Aggregate & RAP =	**5,184 T/day**
Max Annual Production	270,000	Tons/yr	96%	T/yr is Aggregate & RAP =	**259,200 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: **216 T/hr** **2** Transfer Points

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	0.71	0.71	0.43	0.10	1.43	1.43	0.86	0.20
PM-10 (total)	1.56E-03	0.34	0.34	0.20	0.05	0.68	0.68	0.41	0.09
PM-2.5	2.37E-04	0.05	0.05	0.03	0.01	0.10	0.10	0.06	0.01

Conveyor and Scalping Screen Emission Points

Moisture/Control %:
AP-42 Table 11.19.2-2, Note b. Moisture content of uncontrolled sources ranged from 0.21 to 1.3%
AP-42 Table 11.19.2-2, Note b. Moisture content of controlled (water spray) sources ranged from 0.55 to 2.88% --> ~91.3% control for screening, ~95% control for conveyor transfer
Bulk aggregate for HMA plants typically stabilizes between 3 and 5% by weight--> Apply additional **90%** control to lb/hr, etc. for the higher moisture.

Aggregate Weigh Conveyor

Transfer from bins to conveyor and from conveyor to scalping screen: **216 T/hr** **2** Transfer Points

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	7.14E-02	7.14E-02	4.28E-02	9.78E-03	1.43E-01	1.43E-01	8.57E-02	1.96E-02
PM-10 (total)	1.56E-03	3.38E-02	3.38E-02	2.03E-02	4.63E-03	6.75E-02	6.75E-02	4.05E-02	9.25E-03
PM-2.5	2.37E-04	5.11E-03	5.11E-03	3.07E-03	7.00E-04	1.02E-02	1.02E-02	6.14E-03	1.40E-03

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

Aggregate flow across scalping screen onto conveyor: **216 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	0.540	5.40E-01	3.24E-01	7.40E-02
PM-10 (total)	0.0087	0.188	1.88E-01	1.13E-01	2.57E-02
PM-2.5	1.30E-04	0.003	2.81E-03	1.68E-03	3.85E-04

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

Aggregate transfer from conveyor to drum dryer (1 transfer point): **216 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	7.14E-02	7.14E-02	4.28E-02	9.78E-03
PM-10 (total)	1.56E-03	3.38E-02	3.38E-02	2.03E-02	4.63E-03
PM-2.5	2.37E-04	5.11E-03	5.11E-03	3.07E-03	7.00E-04

Facility: Sunroc Corporation dba Depatco Inc. - 00430
4/27/2021 14:19 Permit/Facility ID: P-2008.0058 777-00430

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) =	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	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			1,406.41	1	1,406.41
Methane	0.216	$lb/10^3$ gal	AP-42 Table 1.3-3	1.15E-02	21	0.24
N_2O	0.26	$lb/10^3$ gal	AP-42 Table 1.3-8	1.66E+01	310	5152.57

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	4,455.00	1.00	4,455.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.62	21.00	34.02
N_2O	0.53	$lb/10^3$ gal	AP-42 Table 1.3-8	0.174049	310.00	53.96

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	4,455.00	1.00	4,455.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.62	21.00	34.02
N_2O	0.26	$lb/10^3$ gal	AP-42 Table 1.3-8	0.085383	310.00	26.47

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	858.82	1	858.82
Methane	0.0000023	lb/scf	AP-42 Table 1.4-2	1.65E-02	21	0.35
N_2O	0.0000022	lb/scf	AP-42 Table 1.4-2	1.57E-02	310	4.88

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	4,455.00	1.00	4,455.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.62	21.00	34.02
N_2O	0.26	$lb/10^3$ gal	AP-42 Table 1.3-8	0.085383	310.00	26.47

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	5,861.41
Methane	34.37
N_2O	5,206.52
Grand Total	**11,102.29**

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

A. Drum Mix Plant: **225** Tons/hour 1,200 Hours/year **270,000** Tons/year **5,400** Tons/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = Used Oil Natural Gas LPG/Propane
B. Tank Heater: **2.5000** MMBtu/hr **5,840** Hours/year **16** 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 **3000** Hours/year IC Engine < 600hp #2 Fuel Oil **24** hrs/day
C2. IC Engine 2: **0.00** gal/hour **0** Hours/year IC Engine > 600hp #2 Fuel Oil **0** 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)	7.43	6.02E-02	0.00E+00	2.49E-01	7.73
PM-10 (total)	5.18	4.20E-02	0.00E+00	2.49E-01	5.47
PM-2.5	5.02	2.81E-02	0.00E+00	2.49E-01	5.29
CO	29.25	2.06E-01	0.00E+00	5.69E-01	30.02
NOx	12.38	4.38E-01	0.00E+00		12.81
SO_2	20.03	1.30E+00	0.00E+00		21.32
VOC	7.20	1.35E-02	0.00E+00	9.07E-01	8.12
Lead	3.38E-03	2.75E-05	0.00E+00		3.40E-03
HCl [e]	4.73E-02	0.00E+00	0.00E+00		4.73E-02
Dioxins[e]					
2,3,7,8-TCDD	6.47E-12				**6.47E-12**
Total TCDD	2.87E-11				**2.87E-11**
1,2,3,7,8-PeCDD	9.55E-12				**9.55E-12**
Total PeCDD	6.78E-10				**6.78E-10**
1,2,3,4,7,8-HxCDD	1.29E-11	8.39E-12			**2.13E-11**
1,2,3,6,7,8-HxCDD	4.01E-11				**4.01E-11**
1,2,3,7,8,9-HxCDD	3.02E-11	9.24E-12			**3.94E-11**
Total HxCDD	3.70E-10				**3.70E-10**
1,2,3,4,6,7,8-Hp-CDD	1.48E-10	1.82E-10			**3.30E-10**
Total HpCDD	5.86E-10	2.43E-10			**8.29E-10**
Octa CDD	7.71E-10	1.95E-09			**2.72E-09**
Total PCDD[h]	2.43E-09	2.43E-09			**4.87E-09**
Furans[e]					
2,3,7,8-TCDF	2.99E-11				**2.99E-11**
Total TCDF	1.14E-10	4.01E-11			**1.54E-10**
1,2,3,7,8-PeCDF	1.33E-10				**1.33E-10**
2,3,4,7,8-PeCDF	2.59E-11				**2.59E-11**
Total PeCDF	2.59E-09	5.84E-12			**2.59E-09**
1,2,3,4,7,8-HxCDF	1.23E-10				**1.23E-10**
1,2,3,6,7,8-HxCDF	3.70E-11				**3.70E-11**
2,3,4,6,7,8-HxCDF	5.86E-11				**5.86E-11**
1,2,3,7,8,9-HxCDF	2.59E-10				**2.59E-10**
Total HxCDF	4.01E-10	2.43E-11			**4.25E-10**
1,2,3,4,6,7,8-HpCDF	2.00E-10				**2.00E-10**
1,2,3,4,7,8,9-HpCDF	8.32E-11				**8.32E-11**
Total HpCDF	3.08E-10	1.18E-10			**4.26E-10**
Octa CDF	1.48E-10	1.46E-10			**2.94E-10**
Total PCDF[h]	1.23E-09	3.77E-10			**1.61E-09**
Total PCDD/PCDF[h]	3.70E-09	2.80E-09	0.00E+00		**6.50E-09**
Non-PAH HAPs					
Acetaldehyde[e]	4.01E-02		0.00E+00		**4.01E-02**
Acrolein[e]	5.85E-03		0.00E+00		5.85E-03
Benzene[e]	1.20E-02	3.43E-06	0.00E+00	1.87E-04	**1.22E-02**
1,3-Butadiene[e]			0.00E+00		**0.00E+00**
Ethylbenzene[e]	5.40E-02			3.66E-03	5.77E-02
Formaldehyde[e]	9.55E-02	1.23E-04	0.00E+00	2.70E-03	**9.84E-02**
Hexane[e]	2.07E-01	2.94E-03		4.15E-03	2.14E-01
Isooctane	9.00E-03			2.53E-05	9.03E-03
Methyl Ethyl Ketone[e]	4.50E-03			1.53E-03	6.03E-03
Pentane[e]		4.25E-03			4.25E-03
Propionaldehyde[e]	2.93E-02				2.93E-02
Quinone[e]	3.60E-02				3.60E-02
Methyl chloroform[e]	1.08E-02				1.08E-02
Toluene[e]	6.53E-01	5.56E-06	0.00E+00	3.67E-03	6.56E-01
Xylene[e]	4.50E-02		0.00E+00	1.84E-02	6.34E-02
POM (7-PAH Group)[e]	1.69E-05	1.23E-06	0.00E+00	3.50E-05	**5.31E-05**
TOTAL PAH HAPs	2.73E-02	2.82E-04	0.00E+00	1.52E-03	**2.91E-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	5.24E-03	3.92E-08		6.62E-04	**5.90E-03**
3-Methylchloranthrene[e]	0.00E+00	2.94E-09			**2.94E-09**
Acenaphthene	4.32E-05	6.45E-06	0.00E+00	6.41E-05	**1.14E-04**
Acenaphthylene	6.78E-04	2.43E-06	0.00E+00	4.04E-06	**6.85E-04**
Anthracene	9.55E-05	2.19E-06	0.00E+00	1.75E-05	**1.15E-04**
Benzo(a)anthracene[e]	6.47E-06	2.94E-09	0.00E+00	6.38E-06	**1.29E-05**
Benzo(a)pyrene[e]	3.02E-07	1.96E-09	0.00E+00	2.42E-07	**5.46E-07**
Benzo(b)fluoranthene[e]	3.08E-06	1.22E-06	0.00E+00	7.99E-07	**5.10E-06**
Benzo(e)pyrene	3.39E-06	0.00E+00		1.56E-06	**4.95E-06**
Benzo(g,h,l)perylene	1.23E-06	1.96E-09	0.00E+00	2.00E-07	**1.43E-06**
Benzo(k)fluoranthene[e]	1.26E-06	2.94E-09	0.00E+00	2.31E-07	**1.50E-06**
Chrysene[e]	5.55E-06	2.94E-09	0.00E+00	2.73E-05	**3.28E-05**
Dibenzo(a,h)anthracene[e]	0.00E+00	1.96E-09	0.00E+00	3.89E-08	**4.08E-08**
Dichlorobenzene	0.00E+00	1.96E-06			**1.96E-06**
Fluoranthene	1.88E-05	5.35E-07	0.00E+00	1.70E-05	**3.63E-05**
Fluorene	3.39E-04	3.89E-07	0.00E+00	1.60E-04	**4.99E-04**
Indeno(1,2,3-cd)pyrene[e]	2.16E-07	2.94E-09	0.00E+00	4.94E-08	**2.68E-07**
Naphthalene[e]	2.00E-02	2.07E-04	0.00E+00	2.74E-04	**2.05E-02**
Perylene	2.71E-07	0.00E+00		4.66E-06	**4.93E-06**
Phenanthrene	7.09E-04	5.96E-05	0.00E+00	2.26E-04	**9.94E-04**
Pyrene	9.25E-05	3.89E-07	0.00E+00	5.02E-05	**1.43E-04**
Non-HAP Organic Compounds					
Acetone[e]	1.87E-01	0.00E+00		1.95E-03	1.89E-01
Benzaldehyde	2.48E-02	0.00E+00			2.48E-02
Butane	1.51E-01	3.43E-03			1.54E-01
Butyraldehyde	3.60E-02	0.00E+00			3.60E-02
Crotonaldehyde[e]	1.94E-02	0.00E+00			1.94E-02
Ethylene	1.58E+00	0.00E+00		3.68E-02	1.61E+00
Heptane	2.12E+00	0.00E+00			2.12E+00
Hexanal	2.48E-02	0.00E+00			2.48E-02
Isovaleraldehyde	7.20E-03	0.00E+00			7.20E-03
2-Methyl-1-pentene	9.00E-01	0.00E+00			9.00E-01
2-Methyl-2-butene	1.31E-01	0.00E+00			1.31E-01
3-Methylpentane	4.28E-02	0.00E+00			4.28E-02
1-Pentene	4.95E-01	0.00E+00			4.95E-01
n-Pentane	4.73E-02	0.00E+00			4.73E-02
Valeraldehyde[e]	1.51E-02	0.00E+00			1.51E-02
Metals					
Antimony[e]	4.05E-05	6.39E-05			1.04E-04
Arsenic[e]	1.73E-05	1.61E-05			**3.33E-05**
Barium[e]	1.31E-03	3.13E-05			1.34E-03
Beryllium[e]	0.00E+00	3.38E-07			**3.38E-07**
Cadmium[e]	1.26E-05	4.84E-06			**1.75E-05**
Chromium[e]	1.24E-03	1.03E-05			1.25E-03
Cobalt[e]	5.85E-06	7.32E-05			7.91E-05
Copper[e]	6.98E-04	2.14E-05			7.19E-04
Hexavalent Chromium[e]	1.39E-05	3.02E-06			**1.69E-05**
Manganese[e]	1.73E-03	3.65E-05			1.77E-03
Mercury[e]	5.85E-04	1.37E-06			5.86E-04
Molybdenum[e]	0.00E+00	9.57E-06			9.57E-06
Nickel[e]	1.94E-03	1.03E-03			**2.97E-03**
Phosphorus[e]	6.30E-03	1.15E-04			6.42E-03
Silver[e]	1.08E-04	0.00E+00			1.08E-04
Selenium[e]	7.88E-05	8.31E-06			8.71E-05
Thallium[e]	9.23E-07	0.00E+00			9.23E-07
Vanadium[e]	0.00E+00	3.87E-04			3.87E-04
Zinc[e]	1.37E-02	3.54E-04			1.41E-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

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

A. Drum Mix Plant: **225** Tons/hour 1,200 Hours/year **270,000** Tons/year HMA throughput **5,400** hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = Used Oil Natural Gas LPG/Propane
B. Tank Heater: **2.5000** MMBtu/hr **5,840** Hours/year **16** 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 **3000** Hours/year #2 Fuel Oil Generator < 600hp **24** hrs/day
C2. IC Engine 2: **0.00** gal/hour **0** Hours/year #2 Fuel Oil Generator > 600hp **0** 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]				2.24E-04	2.24E-04
2-Butanone (see Methyl Ethyl Ketone)					
Carbon disulfide[e]				5.60E-04	5.60E-04
Chloroethane (Ethyl chloride[e])				1.12E-04	1.12E-04
Chloromethane (Methyl chloride[e])				7.71E-04	7.71E-04
Cumene				1.03E-03	1.03E-03
n-Hexane					
Methylene chloride (Dichloromethane[e])				7.40E-06	7.40E-06
MTBE					
Styrene[e]				2.16E-04	2.16E-04
Tetrachloroethene (Tetrachloroethylene[e])				7.21E-05	7.21E-05
1,1,1-Trichloroethane (Methyl chloroform[e])					
Trichloroethene (Trichloroethylene[e])					
Trichlorofluoromethane				1.22E-05	1.22E-05
m-/p-Xylene[e]				9.32E-03	9.32E-03
o-Xylene[e]				9.05E-03	9.05E-03
Phenol[e,f]				9.05E-04	9.05E-04
Non-HAP Organic Compounds					
Methane				7.74E-01	7.74E-01

e) IDAPA Toxic Air Pollutant

6.42E-03

0.000387

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: **Sunroc Corporation dba Depatco Inc. - 00430**
4/27/2021 14:19 **Permit/Facility ID:** **P-2008.0058** **777-00430**

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: **225** Tons/hour 1,200 Hours/year **270,000** Tons/year HMA throughput **5,400** hrs/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = Used Oil Natural Gas LPG/Propane
B. Tank Heater: **2.5000** MMBtu/hr **5,840** Hours/year **16** 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 **3000** Hours/year IC Engine <600hp #2 Fuel Oil **24** hrs/day
C2. IC Engine 2: **0.00** gal/hour **0** Hours/year IC Engine > 600hp #2 Fuel Oil **0** 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)	4.46	1.76E-01	0.00E+00	1.50E-01	4.63
PM-10 (total)	3.11	1.23E-01	0.00E+00	1.50E-01	3.23
PM-2.5	3.01	8.20E-02	0.00E+00	1.50E-01	3.09
CO	17.55	6.01E-01	0.00E+00	3.41E-01	18.15
NOx	7.43	1.28E+00	0.00E+00		8.70
SO_2	12.02	3.78E+00	0.00E+00		15.80
VOC	4.32	3.94E-02	0.00E+00	5.44E-01	4.36
Lead	2.03E-03	8.04E-05	0.00E+00		2.11E-03
HCl [e]	2.84E-02	0.00E+00	0.00E+00		2.84E-02
Dioxins[e]					
2,3,7,8-TCDD	2.84E-11				2.84E-11
Total TCDD	1.26E-10				1.26E-10
1,2,3,7,8-PeCDD	4.19E-11				4.19E-11
Total PeCDD	2.97E-09				2.97E-09
1,2,3,4,7,8-HxCDD	5.67E-11	3.68E-11			9.35E-11
1,2,3,6,7,8-HxCDD	1.76E-10				1.76E-10
1,2,3,7,8,9-HxCDD	1.32E-10	4.05E-11			1.73E-10
Total HxCDD	1.62E-09				1.62E-09
1,2,3,4,6,7,8-Hp-CDD	6.48E-10	7.99E-10			1.45E-09
Total HpCDD	2.57E-09	1.07E-09			3.63E-09
Octa CDD	3.38E-09	8.52E-09			1.19E-08
Total PCDD[h]	1.07E-08	1.07E-08			2.13E-08
Furans[e]					
2,3,7,8-TCDF	1.31E-10				1.31E-10
Total TCDF	5.00E-10	1.76E-10			6.75E-10
1,2,3,7,8-PeCDF	5.81E-10				5.81E-10
2,3,4,7,8-PeCDF	1.13E-10				1.13E-10
Total PeCDF	1.13E-08	2.56E-11			1.14E-08
1,2,3,4,7,8-HxCDF	5.40E-10				5.40E-10
1,2,3,6,7,8-HxCDF	1.62E-10				1.62E-10
2,3,4,6,7,8-HxCDF	2.57E-10				2.57E-10
1,2,3,7,8,9-HxCDF	1.13E-09				1.13E-09
Total HxCDF	1.76E-09	1.07E-10			1.86E-09
1,2,3,4,6,7,8-HpCDF	8.78E-10				8.78E-10
1,2,3,4,7,8,9-HpCDF	3.65E-10				3.65E-10
Total HpCDF	1.35E-09	5.17E-10			1.87E-09
Octa CDF	6.48E-10	6.39E-10			1.29E-09
Total PCDF[h]	5.40E-09	1.65E-09			7.05E-09
Total PCDD/PCDF[h]	1.62E-08	1.23E-08			2.85E-08
Non-PAH HAPs					
Acetaldehyde[e]	1.76E-01		0.00E+00		1.76E-01
Acrolein[e]	3.51E-03		0.00E+00		3.51E-03
Benzene[e]	5.27E-02	1.50E-05	0.00E+00	8.18E-04	5.27E-02
1,3-Butadiene[e]	0.00E+00		0.00E+00		0.00E+00
Ethylbenzene[e]	3.24E-02			2.20E-03	3.24E-02
Formaldehyde[e]	4.19E-01	5.37E-04	0.00E+00	1.18E-02	4.19E-01
Hexane[e]	1.24E-01	1.29E-02		2.49E-03	1.37E-01
Isooctane	5.40E-03			1.52E-05	5.40E-03
Methyl Ethyl Ketone[e]	2.70E-03			9.17E-04	2.70E-03
Pentane[e]	0.00E+00	1.86E-02			1.86E-02
Propionaldehyde[e]	1.76E-02				1.76E-02
Quinone[e]	2.16E-02				2.16E-02
Methyl chloroform[e]	6.48E-03				6.48E-03
Toluene[e]	3.92E-01	2.43E-05	0.00E+00	2.20E-03	3.92E-01
Xylene[e]	2.70E-02	0.00E+00	0.00E+00	1.10E-02	2.70E-02
TOTAL Federal HAPs (T/yr)=					**1.49E+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	2.30E-02	1.72E-07		2.90E-03	2.30E-02
3-Methylchloranthrene[e]	0.00E+00	1.29E-08			1.29E-08
Acenaphthene	1.89E-04	2.82E-05	0.00E+00	2.81E-04	2.17E-04
Acenaphthylene	2.97E-03	1.07E-05	0.00E+00	1.77E-05	2.98E-03
Anthracene	4.19E-04	9.59E-06	0.00E+00	7.68E-05	4.28E-04
Benzo(a)anthracene[e]	2.84E-05	1.29E-08	0.00E+00	2.79E-05	2.84E-05
Benzo(a)pyrene[e]	1.32E-06	8.59E-09	0.00E+00	1.06E-06	1.33E-06
Benzo(b)fluoranthene[e]	1.35E-05	5.33E-06	0.00E+00	3.50E-06	1.88E-05
Benzo(e)pyrene	1.49E-05	0.00E+00		6.85E-06	1.49E-05
Benzo(g,h,I)perylene	5.40E-06	8.59E-09	0.00E+00	8.75E-07	5.41E-06
Benzo(k)fluoranthene[e]	5.54E-06	1.29E-08	0.00E+00	1.01E-06	5.55E-06
Chrysene[e]	2.43E-05	1.29E-08	0.00E+00	1.19E-04	2.43E-05
Dibenzo(a,h)anthracene[e]	0.00E+00	8.59E-09	0.00E+00	1.70E-07	8.59E-09
Dichlorobenzene	0.00E+00	8.59E-06			8.59E-06
Fluoranthene	8.24E-05	2.34E-06	0.00E+00	7.44E-05	8.47E-05
Fluorene	1.49E-03	1.70E-06	0.00E+00	7.01E-04	1.49E-03
Indeno(1,2,3-cd)pyrene[e]	9.45E-07	1.29E-08	0.00E+00	2.16E-07	9.58E-07
Naphthalene[e]	8.78E-02	9.06E-04	0.00E+00	1.20E-03	8.87E-02
Perylene	1.19E-06	0.00E+00		2.04E-05	1.19E-06
Phenanthrene	3.11E-03	2.61E-04	0.00E+00	9.90E-04	3.37E-03
Pyrene	4.05E-04	1.70E-06	0.00E+00	2.20E-04	4.07E-04
Non-HAP Organic Compounds					
Acetone[e]	1.12E-01	0.00E+00		1.17E-03	1.12E-01
Benzaldehyde	1.49E-02	0.00E+00			1.49E-02
Butane	9.05E-02	1.50E-02			1.05E-01
Butyraldehyde	2.16E-02	0.00E+00			2.16E-02
Crotonaldehyde[e]	1.16E-02	0.00E+00			1.16E-02
Ethylene	9.45E-01	0.00E+00		2.21E-02	9.45E-01
Heptane	1.27E+00	0.00E+00			1.27E+00
Hexanal	1.49E-02	0.00E+00			1.49E-02
Isovaleraldehyde	4.32E-03	0.00E+00			4.32E-03
2-Methyl-1-pentene	5.40E-01	0.00E+00			5.40E-01
2-Methyl-2-butene	7.83E-02	0.00E+00			7.83E-02
3-Methylpentane	2.57E-02	0.00E+00			2.57E-02
1-Pentene	2.97E-01	0.00E+00			2.97E-01
n-Pentane[e]	2.84E-02	0.00E+00			2.84E-02
Valeraldehyde[e]	9.05E-03	0.00E+00			9.05E-03
Metals					
Antimony[e]	2.43E-05	2.80E-04			3.04E-04
Arsenic[e]	7.56E-05	7.03E-05			1.46E-04
Barium[e]	7.83E-04	1.37E-04			9.20E-04
Beryllium[e]	0.00E+00	1.48E-06			1.48E-06
Cadmium[e]	5.54E-05	2.12E-05			7.66E-05
Chromium[e]	7.43E-04	4.50E-05			7.88E-04
Cobalt[e]	3.51E-06	3.21E-04			3.24E-04
Copper[e]	4.19E-04	9.38E-05			5.12E-04
Hexavalent Chromium[e]	6.08E-05	1.32E-05			7.40E-05
Manganese[e]	1.04E-03	1.60E-04			1.20E-03
Mercury[e]	3.51E-04	6.02E-06			3.57E-04
Molybdenum[e]	0.00E+00	4.19E-05			4.19E-05
Nickel[e]	8.51E-03	4.50E-03			1.30E-02
Phosphorus[e]	3.78E-03	5.04E-04			4.28E-03
Silver[e]	6.48E-05	0.00E+00			6.48E-05
Selenium[e]	4.73E-05	3.64E-05			8.36E-05
Thallium[e]	5.54E-07				5.54E-07
Vanadium[e]	0.00E+00	1.69E-03			1.69E-03
Zinc[e]	8.24E-03	1.55E-03			9.79E-03

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

A. Drum Mix Plant: **225** Tons/hour 1,200 Hours/year **270,000** Tons/year **5,400** Tons/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = Used Oil Natural Gas LPG/Propane
B. Tank Heater: **2.5000** MMBtu/hr **5,840** Hours/year **16** 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 **3000** Hours/year #2 Fuel Oil IC Engine <600hp **24** hrs/day
C2. Generator G2: **0.00** gal/hour **0** Hours/year #2 Fuel Oil IC Engine > 600hp **0** 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[g]					
Bromomethane[e]				1.35E-04	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)					0.00E+00
Carbon disulfide[e]				3.36E-04	0.00E+00
Chloroethane (Ethyl chloride[e])				6.70E-05	0.00E+00
Chloromethane (Methyl chloride[e])				4.63E-04	0.00E+00
Cumene				6.18E-04	0.00E+00
n-Hexane				0.00E+00	0.00E+00
Methylene chloride (Dichloromethane[e])				4.44E-06	0.00E+00
MTBE					0.00E+00
Styrene[e]				1.30E-04	0.00E+00
Tetrachloroethene (Tetrachloroethylene[e])				4.32E-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				7.30E-06	0.00E+00
m-/p-Xylene[e]				5.59E-03	0.00E+00
o-Xylene[e]				5.43E-03	0.00E+00
Phenol[e,f]				5.43E-04	0.00E+00
Non-HAP Organic Compounds					
Methane				4.64E-01	0.00E+00

e) IDAPA Toxic Air Pollutant

Facility:	Sunroc Corporation dba Depatco Inc. - 00430			CRITERIA POLLUTANT MODELING
4/27/2021 14:19	Permit/Facility ID:	P-2008.0058	777-00430	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: **225** Tons/hour 1,200 Hours/year **270,000** Tons/year **5,400** Tons/day 24. hr/day 1,200 hr/yr

Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = | Used Oil | Natural Gas | LPG/Propane

0.0015% S | 0.5000% S | **16** hrs/day

B. Tank Heater: **2.5000** MMBtu Rate **5,840** 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

C1. IC Engine 1: **0.00** gal/hour **3000** Hours/year IC Engine < 600hp 0.0015% S | #2 Fuel Oil | **24** hrs/day

C2. IC Engine 2: **0.00** gal/hour **0** Hours/year IC Engine > 600hp 0.0015% S | #2 Fuel Oil | **0** 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)	5.18	4.20E-02	0.00E+00	0.00E+00	1.32E-01	1.17E-01	
PM-2.5	5.02	2.81E-02	0.00E+00	0.00E+00	1.32E-01	1.17E-01	
CO	29.25	2.06E-01	0.00E+00	0.00E+00	2.65E-01	3.04E-01	
NOx	12.38	4.38E-01	0.00E+00	0.00E+00			
SO_2	20.03	1.30E+00	0.00E+00	0.00E+00			
VOC	7.20	1.35E-02	0.00E+00	0.00E+00	2.74E-02	8.80E-01	
Lead	3.38E-03	2.75E-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)	5.18	2.80E-02	0.00E+00	0.00E+00	1.32E-01	1.17E-01	
PM-2.5	5.02	1.87E-02	0.00E+00	0	1.32E-01	1.17E-01	
CO							
NOx							
SO_2	20.03	8.64E-01	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)	0.71	2.80E-02	0.00E+00	0.00E+00	1.81E-02	1.61E-02	
PM-2.5	0.69	1.87E-02					
CO							
NOx	1.70	2.92E-01	0.00	0.00			
SO_2	2.74	0.86	0.00E+00	0.00			
VOC							
Lead							

Facility: **Sunroc Corporation dba Depatco Inc. - 00430**

4/27/2021 14:19 **Permit/Facility ID:** **P-2008.0058** **777-00430**

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: **225** Tons/hour 1,200 Hours/year **270,000** Tons/year **5,400** Tons/day
Maximum emission for each pollutant from any fuel-burning option selected on "Facility Data" worksheet

B. Tank Heater: **2.5000** MMBtu Rated **5,840** 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: **0.00** gal/hour **3000** Hours/year IC Engine <600hp #2 Fuel Oil **24** hrs/day
C2. IC Engine G2: **0.00** gal/hour **0** Hours/year IC Engine > 600hp #2 Fuel Oil **0** 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]	0.047	0.05	No	
Dioxins		**Toxic Equivalency Factor[c]**	**Adjusted Emission Rate (lb/hr)**	
2,3,7,8-TCDD	6.47E-12	1.0	6.47E-12	
Total TCDD	2.87E-11	n/a		
1,2,3,7,8-PeCDD	9.55E-12	1.0	9.55E-12	
Total PeCDD	6.78E-10	n/a		
1,2,3,4,7,8-HxCDD	2.13E-11	0.1	2.13E-12	
1,2,3,6,7,8-HxCDD	4.01E-11	0.1	4.01E-12	
1,2,3,7,8,9-HxCDD	3.94E-11	0.1	3.94E-12	
Total HxCDD	3.70E-10	n/a		
1,2,3,4,6,7,8-Hp-CDD	3.30E-10	0.01	3.30E-12	
Total HpCDD	8.29E-10	n/a		
Octa CDD	2.72E-09	0.0003	8.15E-13	
Total PCDD	4.87E-09	n/a		
Furans				
2,3,7,8-TCDF	2.99E-11	0.1	2.99E-12	
Total TCDF	1.54E-10	n/a		
1,2,3,7,8-PeCDF	1.33E-10	0.03	3.98E-12	
2,3,4,7,8-PeCDF	2.59E-11	0.3	7.77E-12	
Total PeCDF	2.59E-09	n/a		
1,2,3,4,7,8-HxCDF	1.23E-10	0.1	1.23E-11	
1,2,3,6,7,8-HxCDF	3.70E-11	0.1	3.70E-12	
2,3,4,6,7,8-HxCDF	5.86E-11	0.1	5.86E-12	
1,2,3,7,8,9-HxCDF	2.59E-10	0.1	2.59E-11	
Total HxCDF	4.25E-10	n/a		
1,2,3,4,6,7,8-HpCDF	2.00E-10	0.01	2.00E-12	
1,2,3,4,7,8,9-HpCDF	8.32E-11	0.01	8.32E-13	
Total HpCDF	4.26E-10	n/a		
Octa CDF	2.94E-10	0.0003	8.82E-14	
Total PCDF	1.61E-09	n/a		
Total PCDD/PCDF	6.50E-09	n/a		
TOTAL Dioxin/Furans[c]	Adjusted lb/hr 9.57E-11	TAPs EL for 2,3,7,8 TCDD 1.50E-10	**Exceeds TAPs EL?** No	**Modeled?**
Non-PAH HAPs				
Acetaldehyde	4.01E-02	3.00E-03	Exceeds	
Acrolein	5.85E-03	0.017	No	
Benzene	1.22E-02	8.00E-04	Exceeds	
1,3-Butadiene				
Ethylbenzene	5.77E-02	29	No	
Formaldehyde	9.84E-02	5.10E-04	Exceeds	
Hexane	2.14E-01	12	No	
Isooctane	9.03E-03			
Methyl Ethyl Ketone	6.03E-03	39.3	No	
Pentane	4.25E-03	118	No	
Propionaldehyde	2.93E-02	0.0287	Exceeds	
Quinone	3.60E-02	0.027	Exceeds	
Methyl chloroform	1.08E-02	127	No	
Toluene	6.56E-01	25	No	
Xylene	6.34E-02	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	5.90E-03	9.10E-05	Exceeds	
3-Methylchloranthrene	2.94E-09	2.50E-06	No	
Acenaphthene	1.14E-04	9.10E-05	Exceeds	
Acenaphthylene	6.85E-04	9.10E-05	Exceeds	
Anthracene	1.15E-04	9.10E-05	Exceeds	
Benzo(a)anthracene	1.29E-05			see POM
Benzo(a)pyrene	5.46E-07	2.00E-06	No	see POM
Benzo(b)fluoranthene	5.10E-06			see POM
Benzo(e)pyrene	4.95E-06	9.10E-05	No	
Benzo(g,h,l)perylene	1.43E-06	9.10E-05	No	
Benzo(k)fluoranthene	1.50E-06			see POM
Chrysene	3.28E-05			see POM
Dibenzo(a,h)anthracene	4.08E-08			see POM
Dichlorobenzene	1.96E-06	9.10E-05	No	
Fluoranthene	3.63E-05	9.10E-05	No	
Fluorene	4.99E-04	9.10E-05	Exceeds	
Indeno(1,2,3-cd)pyrene	2.68E-07			see POM
Naphthalene[e]	2.05E-02	9.10E-05	Exceeds	
Perylene	4.93E-06	9.10E-05	No	
Phenanthrene	9.94E-04	9.10E-05	Exceeds	
Pyrene	1.43E-04	9.10E-05	Exceeds	
PolycyclicOrganicMatter[d]	5.31E-05	2.00E-06	Exceeds	
Non-HAP Organic Compounds				
Acetone	1.89E-01	119	No	
Benzaldehyde	2.48E-02			
Butane	1.54E-01			
Butyraldehyde	3.60E-02			
Crotonaldehyde	1.94E-02	0.38	No	
Ethylene	1.61E+00			
Heptane	2.12E+00	109	No	
Hexanal	2.48E-02			
Isovaleraldehyde	7.20E-03			
2-Methyl-1-pentene	9.00E-01			
2-Methyl-2-butene	1.31E-01			
3-Methylpentane	4.28E-02			
1-Pentene	4.95E-01			
n-Pentane[e]	4.73E-02	118	No	
Valeraldehyde (n-Valeraldehyde)	1.51E-02	11.7	No	
Metals				
Antimony[e]	1.04E-04	0.033	No	
Arsenic	3.33E-05	1.50E-06	Exceeds	
Barium	1.34E-03	0.033	No	
Beryllium	3.38E-07	2.80E-05	No	
Cadmium	1.75E-05	3.70E-06	Exceeds	
Chromium	1.25E-03	0.033	No	
Cobalt	7.91E-05	0.0033	No	
Copper	7.19E-04	0.013	No	
Hexavalent Chromium	1.69E-05	5.60E-07	Exceeds	
Manganese	1.77E-03	0.067	No	
Mercury	5.86E-04	0.003	No	
Molybdenum	9.57E-06	0.333	No	
Nickel	2.97E-03	2.70E-05	Exceeds	
Phosphorus	6.42E-03	0.007	No	
Silver	1.08E-04	0.007	No	
Selenium	8.71E-05	0.013	No	
Thallium	9.23E-07	0.007	No	
Vanadium	3.87E-04	0.003	No	
Zinc	1.41E-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: **Sunroc Corporation dba Depatco Inc. - 00430**

4/27/2021 14:19 **Permit/Facility ID:** **P-2008.0058** **777-00430**

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: **225** Tons/hour 1,200 Hours/year **270,000** Tons/year **5,400** Tons/day

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

B. Tank Heater: **2.5000** MMBtu Rated **5,840** Hours/year **D. Include all emissions from Load-out/Silo Filling? Yes**

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

C1. IC Engine G1: **0.00** gal/hour **3000** Hours/year #2 Fuel Oil **24** hrs/day

C2. IC Engine G2: **0.00** gal/hour **0** Hours/year #2 Fuel Oil **0** 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[g]				
Bromomethane (Methyl bromide[e])	2.24E-04	1.27	No	
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	5.60E-04	2	No	
Chloroethane (Ethyl chloride[e])	1.12E-04	176	No	
Chloromethane (Methyl chloride[e])	7.71E-04	6.867	No	
Cumene[e]	1.03E-03	16.3	No	
n-Hexane[e] (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	7.40E-06	1.60E-03	No	
MTBE	0.00E+00			
Styrene[e]	2.16E-04	6.67	No	
Tetrachloroethene (Tetrachloroethylene[e])	7.21E-05	1.30E-02	No	
1,1,1-Trichloroethane (see Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])	0.00E+00	17.93	No	
Trichlorofluoromethane	1.22E-05			
m-/p-Xylene[e] (added into Xylene[e])				
o-Xylene[e] (added into Xylene[e])				
Phenol[e,f]	9.05E-04	1.27	No	
Non-HAP Organic Compounds				
Methane	7.74E-01			

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

Facility:	**Sunroc Corporation dba Depatco Inc. - 00430**			**TAPs MODELING**
4/27/2021 14:19	**Permit/Facility ID:**	**P-2008.0058**	**777-00430**	**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: **225** Tons/hour 1,200 Hours/year **270,000** Tons/year **5,400** Tons/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = Used Oil Natural Gas LPG/Propane
B. Tank Heater: **2.5000** MMBtu Rated **5,840** Hours/year **16** 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 **3000** Hours/year IC Engine < 600hp #2 Fuel Oil **24** hrs/day
C2. IC Engine: **0.00** gal/hour **0** Hours/year IC Engine > 600h #2 Fuel Oil **0** 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]	4.73E-02	0.00E+00	0	0		
Dioxins[e]						
2,3,7,8-TCDD	6.47E-12		0	0		
Total TCDD	2.87E-11		0	0		
1,2,3,7,8-PeCDD	9.55E-12		0	0		
Total PeCDD	6.78E-10		0	0		
1,2,3,4,7,8-HxCDD	1.29E-11	8.39E-12	0	0		
1,2,3,6,7,8-HxCDD	4.01E-11		0	0		
1,2,3,7,8,9-HxCDD	3.02E-11	9.24E-12	0	0		
Total HxCDD	3.70E-10		0	0		
1,2,3,4,6,7,8-Hp-CDD	1.48E-10	1.82E-10	0	0		
Total HpCDD	5.86E-10	2.43E-10	0	0		
Octa CDD	7.71E-10	1.95E-09	0	0		
Total PCDD[h]	2.43E-09	2.43E-09	0	0		
Furans[e]						
2,3,7,8-TCDF	2.99E-11		0	0		
Total TCDF	1.14E-10	4.01E-11	0	0		
1,2,3,7,8-PeCDF	1.33E-10		0	0		
2,3,4,7,8-PeCDF	2.59E-11		0	0		
Total PeCDF	2.59E-09	5.84E-12	0	0		
1,2,3,4,7,8-HxCDF	1.23E-10		0	0		
1,2,3,6,7,8-HxCDF	3.70E-11		0	0		
2,3,4,6,7,8-HxCDF	5.86E-11		0	0		
1,2,3,7,8,9-HxCDF	2.59E-10		0	0		
Total HxCDF	4.01E-10	2.43E-11	0	0		
1,2,3,4,6,7,8-HpCDF	2.00E-10		0	0		
1,2,3,4,7,8,9-HpCDF	8.32E-11		0	0		
Total HpCDF	3.08E-10	1.18E-10	0	0		
Octa CDF	1.48E-10	1.46E-10	0	0		
Total PCDF[h]	1.23E-09	3.77E-10	0	0		
Total PCDD/PCDF[h]	3.70E-09	2.80E-09	0	0		
Non-PAH HAPs						
Acetaldehyde[e]	4.01E-02		0	0		
Acrolein[e]	5.85E-03		0	0		
Benzene[e]	**1.20E-02**	**3.43E-06**	0	0	**1.20E-04**	**6.67E-05**
1,3-Butadiene[e]			0	0		
Ethylbenzene[e]	5.40E-02		0	0	1.04E-03	2.62E-03
Formaldehyde[e]	**9.55E-02**	**1.23E-04**	0	0	**2.59E-03**	**1.13E-04**
Hexane[e]	2.07E-01	2.94E-03	0	0	2.74E-03	1.40E-03
Isooctane	9.00E-03		0	0	8.50E-06	1.68E-05
Methyl Ethyl Ketone[e]	4.50E-03		0	0	1.07E-03	4.59E-04
Pentane[e]		4.25E-03	0	0		
Propionaldehyde[e]	2.93E-02		0	0		
Quinone[e]	3.60E-02		0	0		
Methyl chloroform[e]	1.08E-02		0	0		
Toluene[e]	6.53E-01	5.56E-06	0	0	1.70E-03	1.97E-03
Xylene[e]	4.50E-02		0	0	7.05E-03	1.13E-02
POM (7-PAH Group)	**1.69E-05**	**1.23E-06**		**0.00E+00**	**2.08E-05**	**1.42E-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	**5.24E-03**	**3.92E-08**	0	0	**4.12E-04**	**2.50E-04**
3-Methylchloranthrene[e]	**0.00E+00**	**2.94E-09**	0	0		
Acenaphthene	**4.32E-05**	**6.45E-06**	0	0	**3.68E-05**	**2.73E-05**
Acenaphthylene	**6.78E-04**	**2.43E-06**	0	0	**1.10E-06**	**2.94E-06**
Anthracene	**9.55E-05**	**2.19E-06**	0	0	**1.02E-05**	**7.36E-06**
Benzo(a)anthracene[e]	**6.47E-06**	**2.94E-09**	0	0	**4.38E-06**	**2.00E-06**
Benzo(a)pyrene[e]	**3.02E-07**	**1.96E-09**	0	0	**0.00E+00**	**2.42E-07**
Benzo(b)fluoranthene[e]	**3.08E-06**	**1.22E-06**	0	0	**0.00E+00**	**7.99E-07**
Benzo(e)pyrene	**3.39E-06**	**0.00E+00**	0	0	**7.43E-07**	**8.20E-07**
Benzo(g,h,I)perylene	**1.23E-06**	**1.96E-09**	0	0	**0.00E+00**	**2.00E-07**
Benzo(k)fluoranthene[e]	**1.26E-06**	**2.94E-09**	0	0	**0.00E+00**	**2.31E-07**
Chrysene[e]	**5.55E-06**	**2.94E-09**	0	0	**1.64E-05**	**1.08E-05**
Dibenzo(a,h)anthracene[e]	**0.00E+00**	**1.96E-09**	0	0	**0.00E+00**	**3.89E-08**
Dichlorobenzene	**0.00E+00**	**1.96E-06**	0	0		
Fluoranthene	**1.88E-05**	**5.35E-07**	0	0	**1.17E-05**	**5.25E-06**
Fluorene	**3.39E-04**	**3.89E-07**	0	0	**7.90E-05**	**8.09E-05**
Indeno(1,2,3-cd)pyrene[e]	**2.16E-07**	**2.94E-09**	0	0	**0.00E+00**	**4.94E-08**
Naphthalene[e]	**2.00E-02**	**2.07E-04**	0	0	**1.42E-04**	**1.31E-04**
Perylene	**2.71E-07**	**0.00E+00**	0	0	**2.35E-06**	**2.31E-06**
Phenanthrene	**7.09E-04**	**5.96E-05**	0	0	**1.41E-04**	**8.51E-05**
Pyrene	**9.25E-05**	**3.89E-07**	0	0	**3.44E-05**	**1.58E-05**
Non-HAP Organic Compounds						
Acetone[e]	1.87E-01	0.00E+00	0	0	1.51E-03	4.38E-04
Benzaldehyde	2.48E-02	0.00E+00	0	0		
Butane	1.51E-01	3.43E-03	0	0		
Butyraldehyde	3.60E-02	0.00E+00	0	0		
Crotonaldehyde[e]	1.94E-02	0.00E+00	0	0		
Ethylene	1.58E+00	0.00E+00	0	0	3.02E-02	6.64E-03
Heptane	2.12E+00	0.00E+00	0	0		
Hexanal	2.48E-02	0.00E+00	0	0		
Isovaleraldehyde	7.20E-03	0.00E+00	0	0		
2-Methyl-1-pentene	9.00E-01	0.00E+00	0	0		
2-Methyl-2-butene	1.31E-01	0.00E+00	0	0		
3-Methylpentane	4.28E-02	0.00E+00	0	0		
1-Pentene	4.95E-01	0.00E+00	0	0		
n-Pentane	4.73E-02	0.00E+00	0	0		
Valeraldehyde[e]	1.51E-02	0.00E+00	0	0		
Metals						
Antimony[e]	4.05E-05	6.39E-05	0	0		
Arsenic[e]	**1.73E-05**	**1.61E-05**	0	0		
Barium[e]	1.31E-03	3.13E-05	0	0		
Beryllium[e]	**0.00E+00**	**3.38E-07**	0	0		
Cadmium[e]	**1.26E-05**	**4.84E-06**	0	0		
Chromium[e]	1.24E-03	1.03E-05	0	0		
Cobalt[e]	5.85E-06	7.32E-05	0	0		
Copper[e]	6.98E-04	2.14E-05	0	0		
Hexavalent Chromium[e]	**1.39E-05**	**3.02E-06**	0	0		
Manganese[e]	1.73E-03	3.65E-05	0	0		
Mercury[e]	5.85E-04	1.37E-06	0	0		
Molybdenum[e]	0.00E+00	9.57E-06	0	0		
Nickel[e]	**1.94E-03**	**1.03E-03**	0	0		
Phosphorus[e]	6.30E-03	1.15E-04	0	0		
Silver[e]	1.08E-04	0.00E+00	0	0		
Selenium[e]	7.88E-05	8.31E-06	0	0		
Thallium[e]	9.23E-07	0.00E+00	0	0		
Vanadium[e]	0.00E+00	3.87E-04	0	0		
Zinc[e]	1.37E-02	3.54E-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

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSIS

M E M O R A N D U M DRAFT

DATE: April 1, 2021

TO: Christina Boulay, Permit Writer, Air Program

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

PROJECT: P-2008.0058 PROJ 62568, Modification of Existing Permit to Construct (PTC) for Sunroc Corporation dba Depatco Inc. Hot Mix Asphalt Plant.

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
acfm	Actual cubic feet per minute
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
bhp	brake horsepower
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
DEQ	Idaho Department of Environmental Quality
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
GEP	Good Engineering Practice
hr	hours
IC	internal combustion
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
m	Meters
m/sec	Meters per second
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NWS	National Weather Service
O_3	Ozone
PAH	Polyaromatic Hydrocarbons
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
POM	Polycyclic Organic Matter
ppb	parts per billion
PRIME	Plume Rise Model Enhancement
PTC	Permit to Construct
PTE	Potential to Emit
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
SRC	Sunroc Corporation dba Depatco, Inc.
TAP	Toxic Air Pollutant
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

Sunroc Corporation dba Depatco, Inc. (SRC) submitted a Permit to Construct (PTC) application to modify their existing permit, P-2008.0058, for operation of a portable hot mix asphalt (HMA) plant in Idaho. The modification would allow a site-specific operational scenario for its current location southwest of Idaho Falls. Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03) requires that no permit be issued unless it is demonstrated that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment. This memorandum provides a summary of the applicable impact analysis requirements and a summary of those analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

DEQ review of submitted data and DEQ analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the facility at Idaho Falls site will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emission estimates was primarily the responsibility of the DEQ permit writer and is addressed in the main body of the DEQ Statement of Basis.

Table 1 presents key assumptions and results to be considered in the development of the permit. Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

The submitted information, in combination with DEQ's analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emissions increases associated with the project will not result in increased emissions above ELs or ambient air impacts exceeding allowable TAP increments. This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Summary of Submittals and Actions

- January 27, 2021: Application received by DEQ.
- February 2, 2021: Regulatory start date.
- February 16, 2020: Application determined complete by DEQ.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES FOR OPERATION AT THE IDAHO FALLS SITE	
Criteria/Assumption/Result	**Explanation/Consideration**
Emission Source Setback from Ambient Air Boundary. No setback distance is required when operating at the Idaho Falls site, provided the HMA plant is operated as described in the memorandum and emissions points are positioned on the site as described in the application and in this memorandum.	A requirement for emission point setback from ambient air was not needed to assure compliance with applicable standards because impact analyses were performed using specific equipment placement at the site and the established ambient air boundary of the site.
Correction of Setback Distance when Operating at Other Locations. The setback distance from the drum dryer stack to the ambient air boundary, for the scenario when operating at locations other than the Idaho Falls site, should be corrected from 130 feet to 130 meters.	The previous modeling memorandum, supporting the existing permit, listed a setback of 130 meters, but the permit incorrectly listed the setback as feet.
Allowable Production. Maximum HMA production does not exceed allowable rates of 225 ton/hour, 5,400 ton/day, and 270,000 ton/year.	Short-term and annual pollutant impact analyses were performed using emissions based on these rates. These rates must not be exceeded.
Drum Dryer Stack Height. The drum dryer stack height is at least 21.5 feet (the value used in the air impact modeling analyses).	This was the stack height used for the previous permitting project.
Operations with Generators. Analyses were performed assuming the HMA will be operated with line power only, and no internal combustion (IC) engines will be used at the site to generate power.	NAAQS compliance is not assured if IC engines are used to generate power at the site. Site-specific conditions in the permit should prohibit operation of an IC engine for this scenario.
Control of Vehicle Fugitive Emissions: Air impact analyses were performed assuming fugitive particulate emissions from vehicle traffic on unpaved roadways is negligible and could be reasonably accounted for in the background concentration used.	Emissions from vehicle traffic must be controlled to a high degree, otherwise compliance with particulate NAAQS has not been demonstrated.
General Emissions Rates. Emissions rates used in the impact analyses, as listed in this memorandum, must represent maximum emissions as given by design capacity, inherently limited by the process or configuration of the facility, or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emissions rates greater than those used in the air impact modeling analyses.
T-RACT Implementation. Emissions from the drum dryer and the asphalt oil heater must be no greater than what is considered Toxic Air Pollutant Reasonably Available Control Technology (T-RACT).	Modeled impacts of nickel exceed the AACC, but are less than 10 times the AACC. Impacts of less than 10 times the AACC are acceptable per Idaho Air Rules Section 210.12 if T-RACT is used.
Location with other pollutant emitting equipment. Co-contributing emissions sources such as other HMA plants, concrete batch plants (CBPs), and/or rock crushing plants will not locate on the plant property within 1,000 feet of the drum dryer stack of the HMA plant, except as noted below for a rock crushing plant. NAAQS compliance is assured for the HMA plant operating with a co-contributing rock crushing plant, provided the HMA plant does not operate at a daily production rate of more than half that allowed by the issued PTC (2,700 ton/day) on any day when the rock crushing plant operates, and provided the annual actual throughput of the rock crushing plant is less than 500,000 ton/year.	Emissions are considered co-contributing if they occur within 1,000 feet (305 meters) of each other. Once the HMA plant is established at the Idaho Falls site, the facility is not responsible for controlling other facilities from moving in nearby, provided they are not on the same property as the permittee. Neighboring facilities would be required to account for the HMA impacts for their own permitting analyses.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES FOR OPERATION AT THE IDAHO FALLS SITE	
Criteria/Assumption/Result	**Explanation/Consideration**
Release Parameters for Emission Points. Stack heights are no shorter than what is indicated in this memorandum. Most importantly, the drum dryer stack height must be no less than 21.5 feet. Stack diameters are no larger than what is indicated in this memorandum. Exhaust flow rates and temperatures at the point of release are not less than about 80 percent of the values indicated in this memorandum.	Compliance with applicable air quality standards are not assured if release parameters vary substantially from what was used in impact analyses.

2.0 Background Information

This section provides background information relevant to the project and the site where the facility is located. It also provides a description of the applicable air impact analyses requirements for the project.

2.1 Project Description, Proposed Location, and Area Classification

The proposed project is modification of PTC P-2008.0058 for SRC's portable HMA plant. The modification adds a site-specific operational scenario when operating at Latitude 43.433, Longitude -l12.091, which is about 4,000 feet southwest of the intersection of S. Yellowstone Highway and W. 65th Street in Bonneville County. The site-specific scenario consists of the following:

- A specific equipment configuration at the site, as specified by the applicant and as observed through using GoogleEarth;
- Identification of an ambient air boundary at the site, beyond which NAAQS and TAP increment compliance must be met;
- Indefinite operation at the site (no requirement to relocate every 12 months);
- IC engines will not be used at the site to power generators;
- The plant may operate year around (no seasonal restriction);
- The drum dryer stack will be at least 21.5 feet at the point of release to the atmosphere;
- The requirement of an emission point setback from ambient air in the existing permit does not apply for this site-specific scenario, provided emission points are configured as described in this memorandum.

Pollutant-emitting processes conducted at the HMA plant include drum drying aggregate (fueled by recycled fuel oil (RFO), natural gas, or propane) and mixing with asphalt oil, handling of aggregate materials, handling of produced asphalt, and combustion of diesel, natural gas, or propane in the asphalt tank heater.

2.2 Air Impact Analyses Required for All Permits to Construct

Criteria Pollutant and TAP Impact Analyses for a PTC are addressed in Idaho Air Rules Sections 203.02 and 203.03:

No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:

***02. NAAQS**. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*

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

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

***Estimates of Ambient Concentrations**. All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.3 Significant Impact Level and Cumulative NAAQS Impact Analyses

The SIL analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in Appendix W. Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a "significant contribution" in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

If modeled maximum pollutant impacts to ambient air from the emissions sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from facility-wide emissions, and emissions from any nearby co-contributing sources, and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit[c] ($\mu g/m^3$)**	**Modeled Design Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[r] (188 $\mu g/m^3$)	Mean of maximum 8th highest[s]
	Annual	1.0	100[t]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[t]	Maximum 1st highest[n]
	Quarterly	NA	1.5[t]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration. The NAAQS was revised from 15 $\mu g/m^3$ to12 $\mu g/m^3$ on December 14, 2012. However, this standard will not be applicable for permitting purposes in Idaho until it is incorporated by reference *sine die* into Idaho Air Rules (Spring 2014).
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
s. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
t. Not to be exceeded in any calendar year.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

If the cumulative NAAQS impact analysis indicates a violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. This evaluation is made specific to both time and space. As an example, consider a hypothetical case where the SIL analysis indicates the project (new source or modification) has impacts exceeding the SIL and the cumulative impact analysis indicates a violation of the NAAQS. If project-specific impacts are below the SIL at the specific receptors showing the violations during the times when modeled violations occurred, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ

regulatory interpretation[1] (see Section 3.1.1 of this memorandum); or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.4 Toxic Air Pollutant Analyses

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

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

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

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

Per Section 210, if the total project-wide emissions increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

3.0 Analytical Methods and Data

This section describes the methods and data used in analyses to demonstrate compliance with applicable air quality impact requirements.

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the HMA plant were calculated by DEQ for various applicable averaging periods. DEQ's HMA plant emission calculation spreadsheet was

used to calculate emissions for the facility, given the specified equipment and requested operational rates. DEQ air impact analyses assured that the estimated potential emissions rates were properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emissions rates used in the dispersion modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emissions inventory used in the DEQ Statement of Basis. All modeled criteria air pollutant and TAP emissions rates must be equal to or greater than the facility's potential emissions calculated in the PTC emissions inventory or proposed permit allowable emission rates. Emission calculations are described in more detail in Attachment 1.

3.1.1 Criteria Pollutant Emissions Rates and Modeling Applicability

Exclusion of BRC Sources from NAAQS Compliance Demonstration Requirements

A criteria pollutant-specific NAAQS compliance demonstration may not be required where facility-wide potential to emit (PTE) values for that criteria pollutant would qualify for a BRC permit exemption as per Idaho Air Rules Section 221 (equal to 10 percent of the emissions defined as significant) if it were not for potential emissions of other criteria pollutants or TAPs. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant.[1]" The interpretation policy also states that the exemption criteria of uncontrolled PTE not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year.

The DEQ emission inventory shows that facility-wide controlled PTE emissions of certain criteria pollutants are above BRC levels, as listed in Table 3. The only emissions considered in this calculation are non-fugitive emissions from the HMA plant, including: the drum dryer, asphalt tank heater, and asphalt silo filling. Emissions from material handling of aggregate and asphalt are considered fugitive, and as such were excluded from permit-applicability PTE.

Table 3. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY

Criteria Pollutant	BRC Level (ton/year)	Applicable Facility Wide PTE Emissions (ton/year)	Air Impact Analyses Required?
PM_{10}[a]	1.5	3.3	Yes
$PM_{2.5}$[b]	1.0	3.2	Yes
Carbon Monoxide (CO)	10.0	18	Yes
Sulfur Dioxide (SO_2)	4.0	2.4	No
Nitrogen Oxides (NOx)	4.0	8.7	Yes
Lead (Pb)	0.06	0.0021	No
Ozone (as VOC)	4.0	4.4	Yes

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

Table 4 lists criteria pollutant emission rates used in the DEQ site-specific impact modeling analyses for the requested operational scenario of the HMA plant. Attachment 1 provides additional details of DEQ emission calculations used in the air impact modeling analyses.

Fugitive particulate emissions from frontend loader handling of aggregate material transfers were designated as volume source emissions point AGGHAND in the model. Two transfers were included for the frontend loader source: 1) transfer of aggregate from truck unloading or other transfer means to a storage pile; 2) transfer of aggregate from the storage pile to a hopper. Fugitive particulate emissions from conveyors handling of aggregate material were designated as volume source emissions point CONVEY. Three transfers were included with this source for aggregate conveyors. Emissions rates for AGGHAND and CONVEY are a function of wind speed and were varied in the model for each hour according to wind speed in the meteorological datafile. Attachment 1 provides details on these emissions calculations.

Table 4. HMA PLANT EMISSIONS USED IN DEQ ANALYSES

Emissions Point in Model	Pollutant	Averaging Period	Emissions Rate (lb/hr)[a]
DRYER – asphalt drum dryer/mixer - emissions controlled by a baghouse	PM_{10}	24-hour	5.157[b]
	$PM_{2.5}$	24-hour	5.018[b]
		Annual	0.6873[c]
	NOx	1-hour	12.38
		Annual	1.695[c]
	CO	1-hour	29.25
OILHEAT – diesel-fired oil tank heater	PM_{10}	24-hour	0.02797[b]
	$PM_{2.5}$	24-hour	0.01873[b]
		Annual	0.01873[c]
	NOx	1-hour	0.4379
		Annual	0.2919[c]
	CO	1-hour	0.09122
SILOFILL – loading of asphalt storage silo	PM_{10}	24-hour	0.1318[b]
	$PM_{2.5}$	24-hour	0.1318[b]
		Annual	0.01806[c]
	CO	1-hour	0.2655
SILOLOAD – asphalt loadout from silo to truck	PM_{10}	24-hour	0.1174[b]
	$PM_{2.5}$	24-hour	0.1174[b]
		Annual	0.01609[c]
	CO	1-hour	0.3036
AGGHAND – aggregate handling by frontend loader	PM_{10}	24-hour	0.6753[b,d]
	$PM_{2.5}$	24-hour	0.1023[b,d]
		Annual	0.01401[c,d]
CONVEY – conveyors of aggregate	PM_{10}	24-hour	0.1013[b,d]
	$PM_{2.5}$	24-hour	0.01534[b,d]
		Annual	0.002101[c,d]
SCREEN – scalping screen	PM_{10}	24-hour	0.1879[b]
	$PM_{2.5}$	24-hour	0.002808[b]
		Annual	0.0003847[c]

a. Pounds per hour emission rate used in impact modeling analyses for specified averaging periods.
b. Calculated by multiplying the daily throughput or daily operational hours by the emission factor, then dividing by 24hours/day.
c. Emissions rate is equal to annual emissions divided over 8,760 hours/year.
d. Emissions are varied in the model according to wind speed category (see Attachment 1). Emissions listed are based on a 10 miles/hour (mph) wind speed.

Exclusion from Impact Analyses by Modeling Thresholds

DEQ may determine that reasonably expected impacts from specific criteria pollutant emissions, for those pollutants not excluded from analysis by DEQ's regulatory interpretation policy of exemption provisions

(discussed above), are so minimal that NAAQS compliance is assured without the need to perform a project-specific impact analysis. Modeling applicability threshold emission values were established to evaluate the level below which NAAQS compliance is effectively assured. These thresholds are established in the *Idaho Air Quality Modeling Guideline*[2] (https://www.deq.idaho.gov/permits/air-quality-permitting). DEQ has recently revised modeling applicability thresholds[3] and will be updating the *Idaho Air Quality Modeling Guideline*. The revisions established facility-wide thresholds based on 1/4 of regulatory Significant Emission Rates (SER) defined in Idaho Air Rules for NAAQS with annual averaging periods and (1/4)(SER)/8,760 expressed as pound/hour NAAQS with shorter averaging periods. DEQ also revised SIL thresholds that can be used for either new facilities or facility modification projects.

Total project emissions are provided in Table 5 along with Modeling Applicability Thresholds. Emissions from co-contributing sources are not included in project modeling applicability.

Table 5. EMISSION COMPARISONS TO MODELING THRESHOLDS

Pollutant / Averaging Period	Emission Rate[a]	Facility-Wide Modeling Threshold[b]	SIL Threshold[c]	Project-Specific Air Impact Analyses Required
PM_{10}[d] 24-hour	6.4 lb/hr	0.86 lb/hr	0.32 lb/hr	Yes
$PM_{2.5}$[e] 24-hour	5.4 lb/hr	0.57 lb/hr	0.092 lb/hr	Yes
$PM_{2.5}$ annual	3.3 ton/yr	2.5 ton/yr	0.37 ton/yr	Yes
CO[f] 1-hour	30 lb/hr[g]	5.7 lb/hr	84 lb/hr	No
CO 8-hour	30 lb/hr[g]	5.7 lb/hr	26 lb/hr	Yes
NOx[g] 1-hour	12.8 lb/hr[g]	2.3 lb/hr	0.38 lb/hr	Yes
NOx annual	8.7 ton/yr[g]	10.0 ton/yr	1.9 ton/yr	Yes
VOC[h]	4.9 ton/yr	100 ton/yr (see below for Ozone)		No

a. Emission rate in either pounds/hour (lb/hr) or ton/year (ton/yr) over the specified time interval.
b. Revised modeling applicability thresholds[3]. Threshold based on 1/4 SER for annual NAAQS or (1/4)(SER/8,760) for shorter averaging-period NAAQS.
c. Revised modeling applicability thresholds[3]. Threshold based on the emission not causing an impact that exceeds the applicable SIL.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
f. Carbon monoxide.
g. Nitrogen oxides.
h. Volatile organic compounds regulated for ozone.

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses (see Section 3.3.3) cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting.

Addressing secondary formation of O_3 has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."

The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."

Allowable emission estimates of VOCs and NOx are below the 100 tons/year threshold, and DEQ determined it was not appropriate or necessary to require a quantitative source specific O_3 impact analysis.

Secondary Particulate Formation

The impact from secondary particulate formation resulting from emissions of NOx, SO_2, and/or VOCs was assumed by DEQ to be negligible based on the magnitude of emissions and the short distance from emissions sources to modeled receptors where maximum PM_{10} and $PM_{2.5}$ impacts would be anticipated.

3.1.2 Toxic Air Pollutant Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 220 are only applicable for new or modified sources constructed after July 1, 1995. Table 6 lists emission rates used in the TAP impact analyses performed for those TAPs with potential emissions exceeding the TAP-specific ELs. Polyaromatic hydrocarbons (PAHs) are regulated by DEQ on an individual compound basis rather than a collective impact of all PAH compounds.

3.1.3 Emissions Release Parameters

Table 7 provides emission release parameters for the HMA plant used in the analyses, including stack height, stack diameter, exhaust temperature, and exhaust velocity. Additional details are provided in Attachment 1.

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

- Release point of asphalt silo filling was set at 35 feet, as indicated by Sunroc personnel, and the release point of asphalt loadout operations was set to 11.5 feet, corresponding to the top of a truck bed.

- Stack diameter of 4.3 meters was used to approximately correspond to a typical silo. Model-calculated stack tip downwash will account for downwash affects potentially caused by the silo.

- Stack gas temperature of 346K was calculated by assuming the gas temperature would be half that of the default asphalt temperature of 325°F (1/2 of 325° F = 163° F = 346 K).

- Flow velocity of 0.1 m/sec was used to establish a reasonably conservative total flow from the source of 1,500 actual cubic feet per minute, caused by convection.

Fugitive sources of aggregate handling and screening were modeled as volume sources. The initial horizontal and vertical dispersion coefficients were calculated using methods outlined in the *User's Guide for the AMS/EPA Regulatory Model – AERMOD*[4] and as described in Attachment 1.

Table 6. TAP EMISSIONS USED IN DEQ ANALYSES

TAP	Averaging Period[a]	Emissions (lb/hr)[b]			
		DRYER[c]	HEATER[d]	SILOFILL[e]	SILOLOAD[f]
Acetaldehyde	Annual	4.01 E-2			
Benzene	Annual	1.20 E-2		1.20 E-4	6.67 E-5
Formaldehyde	Annual	9.56 E-2	1.23 E-4	2.59 E-3	1.13 E-4
POM[g]	Annual	1.69 E-5	1.22 E-6	2.08 E-5	1.42 E-5
Arsenic	Annual	1.73 E-5	1.61 E-5		
Cadmium	Annual	1.26 E-5	4.84 E-6		
Chromium 6+	Annual	1.39 E-5	3.02 E-6		
Nickle	Annual	1.94 E-3	1.03 E-3		
Propionaldehyde	24-hour	2.93 E-2			
Quinone	24-hour	3.60 E-2			
PAH compounds[h]					
Naphthalene	Annual	2.00 E-2	2.07 E-4	1.42 E-4	1.31 E-4
2-Methylnaphthalene	Annual	5.24 E-3	3.92 E-8	4.12 E-4	2.50 E-4
Acenaphthene	Annual	4.32 E-5	6.45 E-6	3.68 E-5	2.73 E-5
Acenaphthylene	Annual	6.78 E-4	2.43 E-6	1.10 E-6	2.94 E-6
Anthracene	Annual	9.56 E-5	2.19 E-6	1.02 E-5	7.36 E-6
Fluorene	Annual	3.39 E-4	3.89 E-7	7.90 E-5	8.09 E-5
Phenanthrene	Annual	7.09 E-4	5.96 E-5	1.41 E-4	8.51 E-5
Pyrene	Annual	9.25 E-5	3.89 E-7	3.44 E-5	1.58 E-5

a. Maximum annual emissions are used for carcinogenic TAPs listed in Idaho Air Rules Section 586, and maximum 24-hour emissions are used for noncarcinogenic TAPs listed in Idaho Air Rules Section 585.
b. Maximum emissions for the averaging period of the TAP increment, expressed as pounds/hour. Pound/hour rates for annual averages were calculated by dividing the annual emissions by 8,760 hour/year of operation. Pound/hour rates for 24-hour averages were calculated by dividing the 24-hour emissions by 24 hour/day of operation.
c. Drum dryer.
d. Asphalt tank heater.
e. Loading of asphalt storage silo.
f. Asphalt loadout from storage silo.
g. Polycyclic Organic Matter consisting of a group of seven polyaromatic hydrocarbons (PAHs) as listed in Idaho Air Rules Section 586.
h. Polyaromatic hydrocarbons. PAHs are regulated on an individual PAH basis with the impact of each separate PAH compared to the PAH EL or AACC.

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS impact analysis is needed to demonstrate compliance with applicable NAAQS. A background concentration tool was used to establish ambient air background concentrations for this project. The design value background concentration tool is accessed from the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST: https://arcg.is/1jXmHH) using the location-specific coordinates. These background air pollutant levels are based on regional-scale air impact modeling of criteria pollutants in Washington, Oregon, and Idaho. The modeling was performed for years 2014-2017 using updated air pollutant emissions inventories. Modeled background values were adjusted by the tool according to available ambient monitoring data and improved interpolation techniques.

Table 7. HMA PLANT EMISSION RELEASE PARAMETERS						
Release Point /Location	Source Type	UTM Coordinates of Release Point (m)[a]	Stack Height (m)[a]	Modeled Diameter (m)[a]	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
DRYER	Point	411728 E, 4809462 N	6.6 (21.5 ft)	0.99 (3.3 ft)	428 (310 °F)	14.1 (46 fps)
OILHEAT	Point	411741 E, 4809457 N	3.0 (10.0 ft)	0.30 (1.0 ft)	591 (605 °F)	2.9 (9.5 fps)
SILOFILL	Point	411754 E, 4809489 N	10.7 (35.1 ft)	4.3 (14.1 ft)	346 (163 °F)	0.1
SILOLOAD	Point	411754 E, 4809489 N	3.5 (11.5 ft)	4.3 (14.1 ft)	346 (163 °F)	0.1
Volume Sources						
Release Point /Location	Source Type	UTM Coordinates of Release Point (m)	Release Height (m)[a]	Initial Horizontal Dispersion Coefficient σ_{y0} (m)	Initial Vertical Dispersion Coefficient σ_{z0} (m)	
AGGHAND	Volume	411675 E, 4809500 N	3.0 (9.8 ft)	11.6	2.33	
CONVEY	Volume	411724 E, 4809492 N	4.0 (13.1 ft)	4.65	2.33	
SCREEN	Volume	411706 E, 4809475 N	3.0 (9.8 ft)	2.33	2.33	

a. Meters. Values in parentheses are in feet.
b. Kelvin. Values in parentheses are in degrees Fahrenheit.
c. Meters per second. Values in parentheses are in feet/second.
d. A value of 0 K triggers the model to set the release temperature equal to the ambient temperature in the meteorological data file for that hour modeled.

DEQ used the background concentration tool to determine design value concentrations at the Boise site. The applicable DV background concentrations for these impact analyses are listed in Table 8.

Table 8. AMBIENT BACKGROUND CONCENTRATIONS AT THE SUNROC HMA FACILITY.		
Pollutant	Averaging Period	Background Concentration (µg/m³)[a,b]
PM_{10}	24-hour	77.1
$PM_{2.5}$[c]	24-hour	15.5
	Annual	5.9
NO_2[e]	1-hour	48.3 (25.7 ppb[f])
	Annual	8.6 (4.6 ppb)
CO	8-hour	1200 (1.05 ppm[g])

a. Micrograms per cubic meter, except where noted otherwise.
b. NW AIRQUEST ambient background lookup tool, 2014-2017.
c. Particulate matter with an aerodynamic diameter of 2.5 microns or less.
d. Particulate matter with an aerodynamic diameter of 10 microns or less.
e. Nitrogen dioxide.
f. Parts per billion by volume.
g. Parts per million by volume.

3.3 Impact Modeling Methodology

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

3.3.1 General Overview of Analyses

DEQ calculated the site-specific air pollutant emissions inventory and performed air impact analyses based on information submitted from Sunroc and general knowledge of HMA plants. The submitted information/analyses, in combination with results from DEQ's air impact analyses, demonstrate compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

The site-specific operational scenario for the Sunroc HMA plant is for operation at the Idaho Falls site for an indefinite period. Therefore, site-specific data/characteristics were used in air impact analyses, including meteorological data, site layout, and terrain.

Table 9 provides a brief description of parameters used in the modeling analyses.

Table 9. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	South of Idaho Falls	These analyses are only applicable for operation at the Idaho Falls site.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 19191.
Meteorological Data	Idaho Falls surface and Boise upper air data	See Section 3.3.5 of this memorandum for additional details of the meteorological data.
Terrain	Considered	National Elevation Dataset (NED) was acquired from the USGS for the surrounding area. AERMAP version 18081 was used to process terrain elevation data for all buildings and receptors. See Section 3.3.6 for more details.
Building Downwash	Considered	BPIP-PRIME was used to evaluate building/structure dimensions for consideration of downwash effects in AERMOD.
NOx chemistry	ARM2	NO to NO_2 conversion was addressed using the ARM2 method with default NO_2/NOx ratios (see Section 3.3.4).
Receptor Grid	3,097 receptors	Adequate to resolve maximum modeled impacts: 10-meter spacing out to 50 meters 25-meter spacing out to 150 meters 50-meter spacing out to 500 meters 100-meter spacing out to 1,000 meters 250-meter spacing out to 5,000 meters

3.3.2 Modeling protocol and Methodology

A modeling protocol was not submitted to DEQ prior to the application because DEQ performed the required air impact modeling analyses. Site-specific modeling was generally conducted using data and methods described in the *State of Idaho Air Quality Modeling Guideline*.[2]

3.3.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 19191 was used for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.4 Data and Parameters used for Modeling 1-Hour NO_2 with ARM2

The atmospheric chemistry of NO, NO_2, and O_3 complicates accurate prediction of NO_2 impacts resulting from NOx emissions. The conversion of NO to NO_2 can be conservatively addressed using several methods as outlined in a *2014 EPA NO_2 Modeling Clarification Memorandum*.[5] The guidance outlines a three-tiered approach:

- Tier 1 – assume full conversion of NO to NO_2 where total NOx emissions are modeled and modeled impacts are assumed to be 100 percent NO_2.
- Tier 2 – use an ambient ratio to adjust impacts from the Tier 1 analysis.
- Tier 3 – use a detailed screening method to account for $NO/NO_2/O_3$ chemistry such as the Ozone Limiting Method (OLM) or the Plume Volume Molar Ratio Method (PVMRM).

DEQ used the Ambient Ratio Method 2 (ARM2) method, a Tier 2 analysis method which assumes an ambient equilibrium between NO and NO_2, in which the conversion of NO to NO_2 is predicted using hourly ambient NOx monitoring data. ARM2 has been adopted by the EPA as a default regulatory Tier 2 option. A minimum and maximum NO_2/NOx ratio of 0.5 and 0.9, respectively, were specified in the model.

3.3.5 Meteorological Data

DEQ processed a meteorological dataset from Idaho Falls, Idaho (KIDA; station ID 725785-24145) covering the years 2015-2019. The upper air soundings required by AERMET were obtained from the Boise airport station (site ID 24131). Surface characteristics were determined by DEQ staff using AERSURFACE version 20060. DEQ modeling staff evaluated annual moisture conditions for the AERSURFACE runs based on thirty years of Idaho Falls airport precipitation data. Conditions were determined to be "wet" for 2016, 2017, and 2019, and "average" for 2015 and 2018. Average moisture content is defined as within a 30 percentile of the 30-year mean of 10.1 inches.

Figure 1 shows a wind rose and Figure 2 shows a wind speed histogram at Idaho Falls Airport. On average, winds are dominated by southwesterlies and northerlies with magnitudes of between 1.5 and 8.2 meters/second. Calms were relatively low at less than 1.0 percent, and less than 1.0 percent of the data were missing from the five-year record.

AERMINUTE version 15271 was used to process Automated Surface Observing Systems (ASOS) wind data for use in AERMET. AERMET version 19191 was used to process surface and upper air data and to generate a model-ready meteorological data input file. The "adjust u star" (ADJ_U*) option was applied in AERMET to enhance model performance during low wind speeds under stable conditions. The modeling analyses used the met data set processed with the U* option.

Figure 1. WIND ROSE AT IDAHO FALLS AIRPORT IN IDAHO (2015-2019).

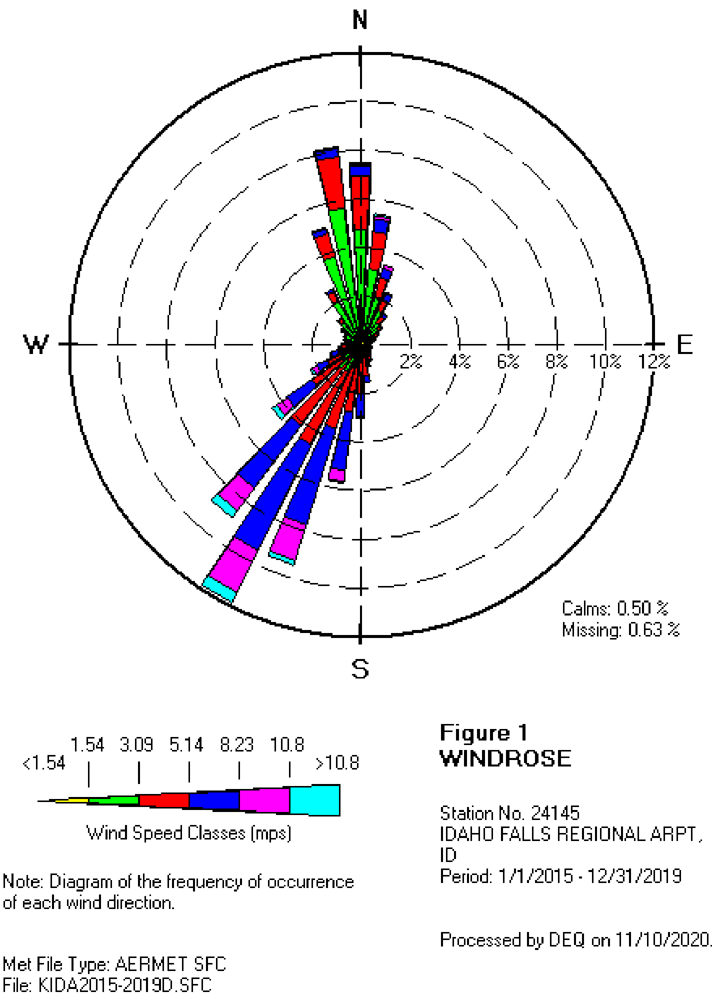
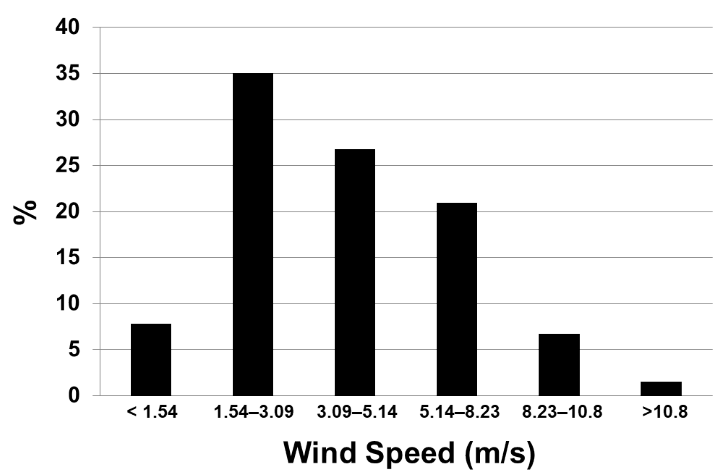


Figure 2. WIND SPEED HISTOGRAM AT IDAHO FALLS AIRPORT IN IDAHO (2015-2019).

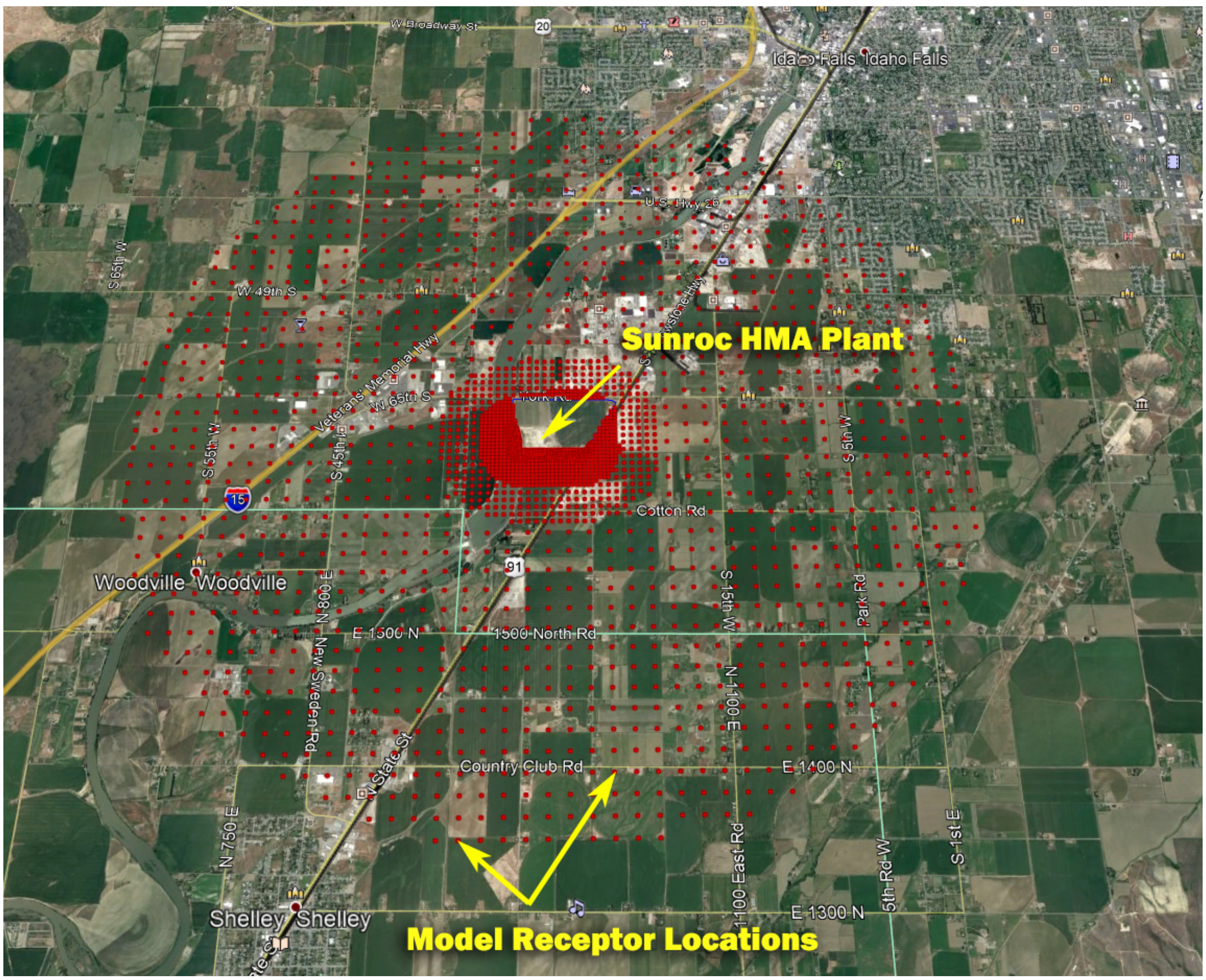


3.3.6 Effects of Terrain on Modeled Impacts

DEQ's ambient air impact analyses used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files.

The terrain preprocessor AERMAP version 18081 was used to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emission plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain. Figure 3 depicts the full 10-km receptor grid used in the analyses, overlaid on a terrain image from Google Earth.

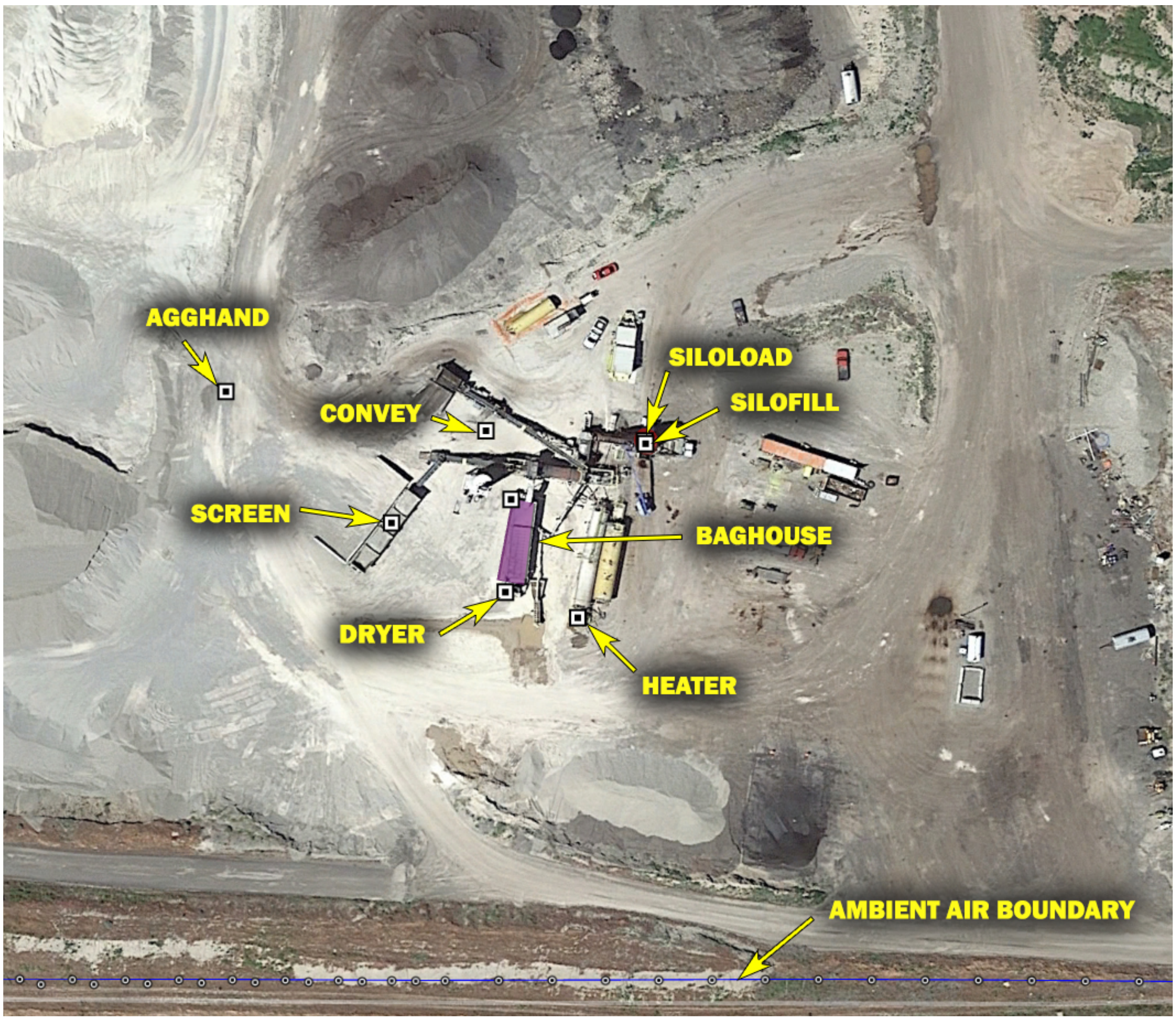
Figure 3. FACILITY LOCATION AND MODELING DOMAIN



3.3.7 Facility Layout

Sunroc provided an aerial photograph with the application showing the site location and boundary of the facility. DEQ used this information and aerial photographs from Google Earth to generate coordinates for emission points as input to the air impact model. Figure 4 shows the placement of structures and emission points used in the model.

Figure 4. STRUCTURE AND EMISSION POINT CONFIGURATION AT THE IDAHO FALLS SITE



Tables 4, 6, and 7 provide a description of modeled emission points indicated in this figure and emission quantities of criteria pollutants and TAPs.

3.3.8 Effects of Building Downwash on Modeled Impacts

The drum dryer baghouse structure was included in the air impact modeling analyses, as shown in Figure 4. Building dimensions were based on information submitted with the application and Google Earth aerial photographs. Table 10 lists the buildings used in the air impact modeling analyses. No other

substantial structures were identified in the application. Downwash effects from equipment or other minor structures at the site were not accounted for because much of the equipment is porous to wind, thereby minimizing downwash effects.

Table 10. BUILDING DIMENSIONS USED IN AIR IMPACT MODELING		
Building ID and description	**Horizontal Dimensions (meters)**	**Building Height (meters)**
BAGHOUSE – HMA plant baghouse	15.5 X 5.0	4.0

3.3.9 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." Ambient air is typically considered as areas external to the identified property boundary where the facility is located, assuming that reasonable measures will be taken to preclude public access.

The submitted application provided a facility plot plan with the ambient air boundary identified. The identified ambient air boundary appeared reasonable, based on an overlay on a Google Earth image of the site. DEQ assumes that Sunroc will take reasonable measures to preclude public access to the site.

3.3.10 Receptor Network

Table 9 describes the receptor network used in the air impact modeling analyses. The full grid, along with the ambient air boundary receptors, includes a total of 3,097 receptors (Figure 3). The receptor grid used in the impact modeling analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[2], providing good resolution of the maximum design concentrations for the project and extensive coverage. The full receptor grid was used for the NAAQS and TAPs ambient air impact analyses.

DEQ determined that the receptor network was effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations.

3.3.11 Crucial HMA Plant Characteristics Affecting Air Quality Impacts

Table 11 lists characteristics of the HMA plant that are critical to the NAAQS and TAPs compliance demonstrations.

Table 11. IMPORTANT CHARACTERISTIC OF HMA PLANT USED IN DEQ ANALYSES	
Parameter	**Value or Description**
Scope of Analyses	This modification only applies to operations at the Idaho Falls site. When locating at other sites, the existing PTC conditions must apply (except for the setback correction).
HMA Production Rate	225 ton/hour, 5,400 ton/day, 270,000 ton/year
Co-Contributing Sources	Impact analyses assumed no co-contributing sources at the site. There is a rock crushing plant on the site, and it will be considered co-contributing when it is located within 1,000 feet of the drum dryer stack (not including conveyor transfer points of the crushing plant). It was assumed that the HMA plant will not operate at a production rate of more than 2,700 ton/day during any day when the crushing plant is operated. Other permitted plants will not be brought onto the permittee's site within 1,000 ft of the HMA plant.

Table 11. IMPORTANT CHARACTERISTIC OF HMA PLANT USED IN DEQ ANALYSES	
Parameter	**Value or Description**
Drum Dryer	Drum dryer fueled by natural gas, propane, or residual fuel oil (RFO) with a baghouse for emissions control. RFO will have a sulfur content of not more than 0.1%.
Dryer Stack Parameters	stack height ≥21.5 ft, stack diameter ≈3.3 ft (effective diameter), gas temp ≥ 310^{o} F, flow velocity ≥14 ft/sec.
Asphalt Silo Filling	Emissions are not controlled from this source.
Conveyor Transfers	≤3 transfers for any given quantity of material processed. Emissions controlled by 90%.
Scalping Screen	≤1 screen for any given quantity of material processed. Emissions controlled by 90%.
Frontend Loader Transfers	≤2 transfers for any given quantity of material processed. Typically involves: 1) aggregate to storage pile; 2) aggregate from pile to hopper.
Portability	The HMA plant was modeled as permanent source, remaining at Idaho Falls location for more than 12 months.
Seasonal Restriction	No seasonal restrictions

4.0 Impact Modeling Results

This section provides results for air impact analyses used to demonstrate compliance with applicable criteria pollutants and TAPs.

4.1 Results for Cumulative NAAQS Analyses

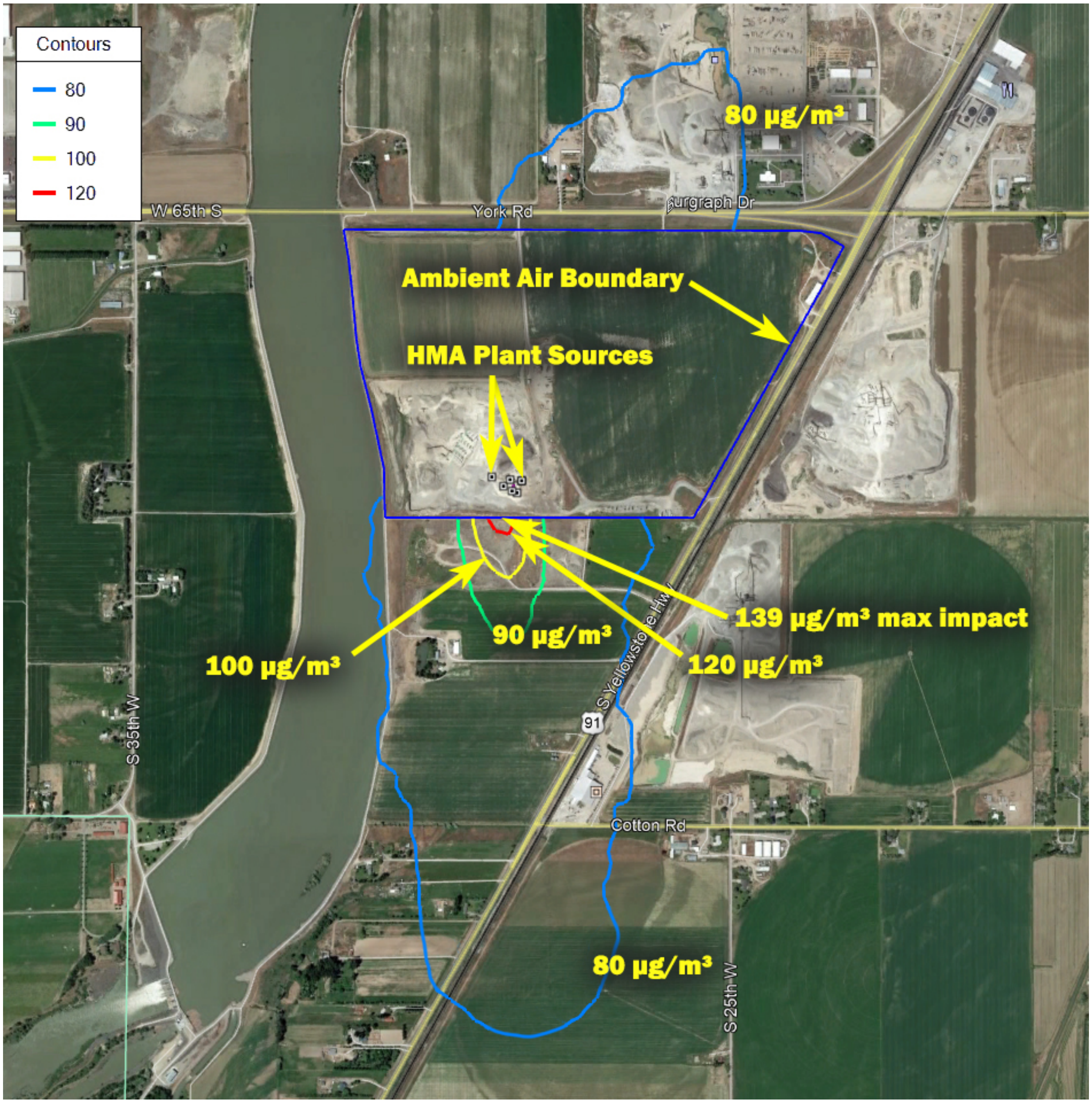
A NAAQS compliance demonstration was required for PM_{10}, $PM_{2.5}$, 1-hour NO_2, 8-hour CO, and DEQ performed a cumulative impact analysis for these pollutants rather than initial SIL analyses. A NAAQS compliance demonstration for SO_2 and Pb were not required for permit issuance because allowable non-fugitive emissions are below BRC thresholds. Site-specific air impact analyses were not required for 1-hour CO and 8-hour O_3 because emissions were below established de minimis thresholds. Table 12 provides results for the cumulative NAAQS impact analysis. For each modeled pollutant, the total impact was calculated by adding the design value of the modeled impact to the ambient background value. The sum was then compared to the NAAQS. Ambient impacts for the facility, when combined with appropriate ambient backgrounds, were below the NAAQS at all modeled receptors.

Table 12. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES						
Pollutant	**Averaging Period**	**Modeled Design Value Concentration (μg/m^3)[a]**	**Background Concentration (μg/m^3)**	**Total Ambient Impact (μg/m^3)**	**NAAQS[b] (μg/m^3)**	**Percent of NAAQS**
PM_{10}[c]	24-hour	62.3	77.1	139.4	150	93
$PM_{2.5}$[d]	24-hour	10.0	15.5	25.5	35	73
	Annual	0.72	5.9	6.62	12	55
NO_2[e]	1-hour	73.0	48.3	121.3	188	65
	Annual	3.21	8.6	11.8	100	12
CO[f]	8-hour	212	1,200	1,412	10,000	14

a. Micrograms per cubic meter.
b. National Ambient Air Quality Standard.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
e. Nitrogen dioxide.
f. Carbon monoxide.

Figure 5 provides 24-hour PM_{10} design value concentration contours, including the 77 µg/m^3 background concentration. As shown in the figure, impacts decrease quickly to background levels a short distance from the facility boundary.

Figure 5. 24-HOUR PM_{10} MODELED IMPACT CONTOURS WITH BACKGROUND



4.2 *Results for TAPs Impact Analyses*

Dispersion modeling was required to demonstrate compliance with TAP increments listed in Idaho Air Rules Section 585 and 586 for those TAPs with project-wide emission increases exceeding ELs. Table 13 lists the maximum modeled impacts for specific TAPs. All modeled impacts are below applicable AACs

and AACCs except for nickel. Maximum nickel impacts were 1.18 E-2 μg/m^3 and the AACC is 4.2 E-3 μg/m^3. The DEQ permit writer assessed potential emission controls that could be considered as T-RACT for nickel. The conclusion was that the existing emission standard for the drum dryer (with baghouse emission control) and the oil heater (with no additional emission control) represents T-RACT for nickel. Therefore, the allowable ambient air impact for nickel is 10 times the AACC, which represents a 1-in-100,000 lifetime cancer risk.

Table 13. TAP AIR IMPACT ANALYSIS RESULTS

TAP	Averaging Period[a]	Maximum Modeled Impact (μg/m^3)[b,c]	AACC/ AAC[d] (μg/m^3)	Percent of AACC
Acetaldehyde	5-year	7.70E-3	4.5 E-1	1.7
Benzene	5-year	3.18 E-3	1.2 E-1	3
Formaldehyde	5-year	3.64 E-2	7.7 E-2	47
Polycyclic Organic Matter (POM)	5-year	2.76 E-4	3.0 E-4	92
Arsenic	5-year	1.81E-4	2.3 E-4	79
Cadmium	5-year	5.56 E-5	5.6 E-4	10
Chromium 6+	5-year	3.55 E-5	8.3 E-5	43
Nickle	5-year	1.17 E-2[e]	4.2 E-3[e]	278
Propionaldehyde	24-hour	1.79 E-1	2.15 E+1	0.8
Quinone	24-hour	2.20 E-1	2.0 E+1	1.1
Polyaromatic Hydrocarbon (PAH) Compounds:	5-year		1.4 E-2	
Naphthalene	5-year	7.07 E-3	1.4 E-2	51
2-Methylnaphthalene	5-year	5.69 E-3	1.4 E-2	41
Acenaphthene	5-year	5.48 E-4	1.4 E-2	4
Acenaphthylene	5-year	1.65 E-4	1.4 E-2	1.2
Anthracene	5-year	1.66 E-4	1.4 E-2	1.2
Fluorene	5-year	1.21 E-3	1.4 E-2	9
Phenanthrene	5-year	2.41 E-3	1.4 E-2	17
Pyrene	5-year	4.00 E-4	1.4 E-2	3

a. Non-carcinogenic TAPs are regulated on a 24-hour basis and carcinogenic TAPs are regulated on an annual basis, with DEQ using the average over the entire period of the meteorological data file.
b. Micrograms per cubic meter.
c. Modeled impact for carcinogenic TAPs represent a period-average (5 years) concentration and modeled impacts for non-carcinogenic TAPs represent the maximum 24-hour average.
d. Acceptable Ambient Concentration for non-carcinogenic TAPs and Acceptable Ambient Concentration of Carcinogens for carcinogenic TAPs.
e. DEQ determined T-RACT was used. Therefore, impacts of 10 times the AACC are allowable.

4.3 Locating with Other Facilities/Equipment

The air impact analyses performed by DEQ for this site-specific scenario of the Sunroc HMA plant assumed that no other permitted sources will locate on the site, except for a rock crushing plant as described below. DEQ modeling staff established a rule-of-thumb distance of 1,000 feet from emissions sources at the HMA plant where emissions from a nearby source/facility would need to be considered in the air impact modeling analyses for the HMA plant. Emissions sources located beyond 1,000 feet are considered too distant to have a measurable impact on receptors substantially impacted by the HMA plant.

HMA plants commonly operate with rock crushing plants at a given site. Since the short-term impacts are the governing criteria, simultaneous operation on an annual basis is not a large concern. DEQ air

modeling staff determined NAAQS compliance is still confidently assured when a rock crushing plant locates within 1,000 feet of the HMA plant, provided the HMA plant does not operate at a daily production level of half that otherwise allowed by the permit during any day when the rock crushing plant is operating. Also, the annual actual throughput of the rock crushing plant is not greater than 500,000 tons.

Once an HMA plant is established at a site, the plant has no control over other facilities locating on neighboring properties (this does not include facilities locating on the same property as the HMA plant). Cumulative impacts would be assessed in the permitting analyses performed for the neighboring facility.

5.0 Conclusions

The ambient air impact analyses and other air quality analyses performed in support of the PTC application demonstrated to DEQ's satisfaction that emissions from the Sunroc HMA plant as described in this memorandum will not cause or significantly contribute to a violation of any ambient air quality standard.

References

1. *Policy on NAAQS Compliance Demonstration Requirements.* Idaho Department of Environmental Quality Policy Memorandum. July 11, 2014.

2. *State of Idaho Guideline for Performing Air Quality Impact Analyses.* Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.

3. *Justification of Revised Modeling Thresholds*. Idaho Department of Environmental Quality. Memorandum from Kevin Schilling, Air Quality Dispersion Modeling Supervisor, to Michael Simon, Stationary Source Bureau Chief. January 14, 2020.

4. *User's Guide for the AMS/EPA Regulatory Model – AERMOD*. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions Monitoring and Analysis Division. EPA-454/B-03-001. September 2004. (Section 3.3.2.2).

5. *Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 National Ambient Air Quality Standard.* U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Modeling Group. Memorandum from R. Chris Owen and Roger Brode, to Regional Dispersion Modeling Contacts. September 30, 2014.

ATTACHMENT 1

EMISSIONS CALCULATIONS AND MODELING PARAMETERS FOR

DEQ’S AIR IMPACT ANALYSES

HMA Plant Modeled Emissions Rates

Compliance determination is linked to throughput levels and the equipment configuration at the site.

Emissions from Drum Dryer, Asphalt Loadout, and Asphalt Silo Filling

DEQ's HMA plant spreadsheet to calculate emissions rates for various averaging periods.

Aggregate Handling Emissions

Emissions from aggregate handling were calculated for the following transfers: 1) aggregate to a storage pile by frontend loader; 2) aggregate from a pile to a hopper by frontend loader; 3) three conveyor transfers.

PM_{10} and $PM_{2.5}$ emissions associated with the handling of aggregate materials were calculated using emissions factors from AP42 Section 13.2.4.

Emissions were calculated using the following emissions equation:

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

Where:

k = 0.053 for $PM_{2.5}$, 0.35 for PM_{10}
M = 3% for aggregate
U = wind speed (mph)

A moisture content of 3% to 7% was estimated as a typical moisture content of aggregate entering the dryer, per STAPPA-ALAPCO-EPA, Emission Inventory Improvement Program, Volume II, Chapter 3, Preferred and Alternative Methods for Estimating Air Emissions from Hot Mix Asphalt Plants, Final Report, July 1996. An additional 90% emissions control was applied to calculated emissions from the conveyor transfers to account for additional emissions control measures required by Idaho regulations and the permit.

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

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

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

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

Base $PM_{2.5}$ factor – use 10 mph wind: $0.053\ (0.0032)\frac{(10/5)^{1.3}}{(3/2)^{1.4}} = 2.367\text{ E-4}$ lb/ton

Base PM_{10} factor – use 10 mph wind: $0.35\ (0.0032)\frac{(10/5)^{1.3}}{(3/2)^{1.4}} = 1.563\text{ E-3}$ lb/ton

Adjustment factors to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (4.702 E-5) = 1.174 E-5 lb/ton
Factor = 1.174 E-5/1.158 E-4 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (4.702 E-5) = 4.923 E-5 lb/ton
Factor = 4.923 E-5 /1.158 E-4 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (4.702 E-5) = 1.039 E-4 lb/ton
Factor = 1.039 E-4/1.158 E-4 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (4.702 E-5) = 1.953 E-4 lb/ton
Factor = 1.953 E-4/1.158 E-4 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (4.702 E-5) = 3.090 E-4 lb/ton
Factor = 3.090 E-4/1.158 E-4 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (4.702 E-5) = 4.362 E-4 lb/ton
Factor = 4.362 E-4/1.158 E-4 = 3.768

For the operational scenario for 5,400 ton/day HMA and 270,000 ton/year HMA, emissions from the loader are as follows (daily and annual throughputs were based on aggregate being 96% of the total HMA production):

Daily $PM_{2.5}$:

2.367 E-4 lb $PM_{2.5}$	5,184 ton	day	2 transfers	=	0.1023 lb
Ton	day	24 hr			hr

Annual $PM_{2.5}$:

2.367 E-4 lb $PM_{2.5}$	259,200 ton	yr	2 transfers	=	0.01401 lb
Ton	yr	8,760 hour			hr

Emissions from the three conveyor transfers are as follows (with an additional 90% control):

Daily $PM_{2.5}$:

2.367 E-4 lb $PM_{2.5}$	5,184 ton	day	3 transfers	(1-0.90)	=	0.01534 lb
Ton	day	24 hr				hr

Annual $PM_{2.5}$:

2.367 E-4 lb $PM_{2.5}$	259,200 ton	yr	3 transfers	(1-0.90)	=	0.002101 lb
ton	yr	8,760 hour				hr

Screening Emissions

This HMA plant uses one scalping screen. A $PM_{2.5}$ factor for uncontrolled emissions was not available in AP42. A $PM_{2.5}$ factor was estimated by DEQ permit writers and entered into the HMA calculation spreadsheet. The uncontrolled emissions factor was used and a 15% reduction applied to calculated emissions to account for additional emissions control measures required by Idaho regulations and the permit.

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

For the operational scenario for 5,400 ton/day HMA and 270,000 ton/year HMA, emissions are as follows:

Scalping Screen (controlled emissions):

Daily $PM_{2.5}$:

0.000130 lb PM_{10}	5,184 ton	day	(1-0.90)	=	0.002808 lb
ton	day	24 hour			hour

Annual $PM_{2.5}$:

0.000130 lb PM_{10}	259,200 ton	year	(1-0.90)	=	0.0003847 lb
ton	year	8,760 hour			hour

HMA Plant Modeling Parameters

Dryer baghouse Stack

Release height = 6.6 meters; effective diameter of release area = 1.0 meters;
typical stack gas temperature = 428 K; typical flow velocity = 14.1 meters/second

Oil Tank Heater Stack

Release height = 3.0 meters; effective diameter of release area = 0.30 meters;
typical stack gas temperature = 591 K; typical flow velocity = 2.9 meters/second

Asphalt Silo Filling

DEQ modeled this source as a point source.
- release height of 10.7 meters
- stack diameter of 4.3 meters, corresponding to the approximate diameter of the silo.
- gas temperature was estimated at half the AP42 default asphalt temperature: 325^{o} F / 2 = 163^{o} F (346 K)
- stack velocity of 0.1 m/sec to account for convective air flow.

Asphalt Loadout

DEQ modeled this source as a point source.
- release height of 3.5 meters
- stack diameter of 4.3 meters, corresponding to the approximate diameter of the silo.
- gas temperature was estimated at half the AP42 default asphalt temperature: 325^{o} F / 2 = 163^{o} F (346 K)
- stack velocity of 0.1 m/sec to account for convective air flow.

Aggregate to Storage and to Hoppers

Release emissions in model from a 50 m X 50 m area 5 m high, released at 3.0 m

Initial dispersion coefficients:

σ_{y0} = 50 m / 4.3 = 11.6 m
σ_{z0} = 5 m / 2.15 = 2.33 m

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

Aggregate Transfers by Conveyor

Release emissions in model from a 20 m X 20 m area 5 m thick, released at 4.0 m

Initial dispersion coefficients:

σ_{y0} = 20 m / 4.3 = 4.65 m
σ_{z0} = 5 m / 2.15 = 2.33 m

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

Scalping Screen

This source was modeled as a single volume source on or adjacent to a structure 10 m X 4 m, 5.0 meters thick, with a release height of 3.0 meters. The initial dispersion coefficients are calculated as follows:

σ_{yo} = 10 m / 4.3 = 2.33 m
σ_{zo} = 5 m / 2.15 = 2.33 m

APPENDIX C – T-RACT ANALYSIS

T-RACT ANALYSIS
Permit to Construct for a Portable Asphalt Plant

IDAPA 58.01.01.210: DEMONSTRATION OF PRECONSTRUCTION COMPLIANCE WITH TOXIC STANDARDS.

01. Identification of Toxic Air Pollutants*. The applicant may use process knowledge, raw materials inputs, EPA and Department references and commonly available references approved by EPA or the Department to identify the toxic air pollutants emitted by the stationary source or modification. (6-30-95)*

DEQ developed an emissions inventory spreadsheet, which includes toxic air pollutants, based on the conditions and assumptions used to develop this Permit to Construct. The spreadsheet for the proposed permitted asphalt production rates (225 T/hour, 5,400 T/day and 270,000 T/year) is provided in Appendix A of the Statement of Basis.

02. Quantification of Emission Rates.

a. *The applicant may use standard scientific and engineering principles and practices to estimate the emission rate of any toxic air pollutant at the point(s) of emission. (6-30-95)*

i. Screening engineering analyses use unrefined conservative data. (6-30-95)

ii. Refined engineering analyses utilize refined and less conservative data including, but not limited to, emission factors requiring detailed input and actual emissions testing at a comparable emissions unit using EPA or Department approved methods. (6-30-95)

Documentation of emissions factors is provided in the DEQ-developed Emissions Inventory Spreadsheet provided in Appendix A of the Statement of Basis.

Information regarding the following presentation of 02.b, c, and d:

- The yellow highlighted text identifies the three types of emission rates: uncontrolled; controlled; and T-RACT.
- The underlined text indicates the subtle differences between the three types of emission rates.

b. *The uncontrolled emissions rate of a toxic air pollutant from a source or modification is calculated using the maximum capacity of the source or modification under its physical and operational design without the effect of any physical or operational limitations. (6-30-95)*

i. Examples of physical and operational design include but are not limited to: the amount of time equipment operates during batch operations and the quantity of raw materials utilized in a batch process.

ii. Examples of physical or operational limitations include but are not limited to: shortened hours of operation, use of control equipment, and restrictions on production which are less than design capacity.

__c.__ The controlled emissions rate of a toxic air pollutant from a source or modification is calculated using the maximum capacity of the source or modification under its physical and operational design with the effect of any physical or operational limitation that has been specifically described in a written and certified submission to the Department. *(6-30-95)*

__d.__ The T-RACT emissions rate of a toxic air pollutant from a source or modification is calculated using the maximum capacity of the source or modification under its physical and operational design with the effect of: *(6-30-95)*

i. Any physical or operational limitation other than control equipment that has been specifically described in a written and certified submission to the Department; and *(6-30-95)*

ii. An emission standard that is T-RACT. *(6-30-95)*

T-RACT is defined in IDAPA 58.01.007.12 as:

"An emission standard based on the lowest emission of toxic air pollutants that a particular source is capable of meeting by the application of control technology that is reasonably available, as determined by the Department, considering technological and economic feasibility. If control technology is not feasible, the emission standard may be based on the application of a design, equipment, work practice or operational requirement, or combination thereof."

INTERPRETATIONS of 210.02:

- 210.02.d.i: T-RACT emissions are based on the uncontrolled emissions from the drum mixer, not the exit of the control device. For this permit, annualized cost effectiveness for each potential T-RACT equipment option for the drum mixer is based on the uncontrolled emissions.
- 210.02.d.ii: Once the T-RACT control device is determined, the ambient concentrations at the property boundary predicted by Subsections 585-586 may be increased by a factor of ten. As explained in Appendix B of the Statement of Basis, this goal is met through a non-standard Ambient Air Quality Impact Analysis developed by DEQ.

DISCUSSION: Metals - Quantification of Emission Rates:

- AP-42, Compilation of Air Pollutant Emission Factors, is the primary compilation of EPA's emission factor information. AP-42, Section 11, Hot Mix Asphalt Plants, Table 11.1-12 provides emission factors for metals from drum mixers for:
  - uncontrolled emissions with fuel oil;
  - baghouse controlled emissions with natural gas or propane;
  - baghouse controlled emissions with diesel and No. 6 fuel oil.
- The emission factor ratings range from C to E.
- The emission factors are the same for gaseous fuels and liquid fuels for all metals except lead and mercury.
- There are no emission factors in AP-42 for metals from any other type of control device.
- The control device manufacturers provide specific particulate control efficiencies for their equipment.
- Metals are part of the particulate load to the control device. The control efficiency is assumed to be the same for each metal.

03. Quantification of Ambient Concentrations. *(6-30-95)*

Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

04. Preconstruction Compliance Demonstration*. The applicant may use any of the Department approved standard methods described in Subsections 210.05 through 210.08, and may use any applicable specialized method described in Subsections 210.09 through 210.12 to demonstrate preconstruction compliance for each identified toxic air pollutant.* *(6-30-95)*

TRACT analysis, as described in Subsection 210.12, is used to demonstrate preconstruction compliance with the toxic air pollutants of Sections 585-586.

05. Uncontrolled Emissions. *(6-30-95)*

a. *Compare the source's or modification's uncontrolled emissions rate for the toxic air pollutant to the applicable screening emission level listed in Sections 585- 586.* *(6-30-95)*

b. *If the source's or modification's uncontrolled emission rate is less than or equal to the applicable screening emission level, no further procedures for demonstrating preconstruction compliance will be required for that toxic air pollutant as part of the application process.* *(6-30-95)*

As explained earlier, uncontrolled emissions of metals from the drum mixer can be calculated. However, the only emissions factors for organic emissions from the drum mixer incorporate some type of control. For consistency in this T-RACT analysis, the emissions presented in Table 1 are all based on AP-42 values which incorporate some type of control. However, the emissions used in the T-RACT cost analysis spreadsheet for metals uses the uncontrolled values.

The majority of the potentially toxic air pollutants from this facility are below the screening ELs and no further action is required. However, DEQ has determined that the pollutants identified in the following table exceed Sections 585-586 ELs.

Table 1 Summary of TAPs that exceed Subsections 210.585-586 Emissions Limits (ELs)
All units expressed as lb/hr[1]

Pollutant	585-586 ELs	Facility
Acetaldehyde	3.0E-03	4.01E-02
Arsenic	1.5E-6	3.33E-05
Cadmium	3.7E-6	1.75E-05
Chromium (VI)	5.6E-7	1.69E-05
Nickel	2.7E-5	2.97E-03
Benzene	8.0E-4	1.22E-02
Formaldehyde[4]	5.1E-4	2.70E-03
PAH[5]	9.1E-5	2.91E-02
POM[6]	2.0E-6	5.31E-05

1 Emissions rates are expressed as annual averages, except for quinone which is a 24-hour average.

2 Emissions as calculated with AP-42 factors, which are based on some type of control equipment being utilized. Refer to the EPA Background Document (posted online) for additional information.

3 As explained in 586, each dioxin/furan is multiplied by a toxicity factor. These adjusted emission rates are then summed for the facility.

4 Formaldehyde is an organic compound, but is not a polyorganic compound, and therefore not included in POM.

5 PAH is treated as a single HAP

6 POM is expressed as a seven PAH group and is treated as a single TAP

In terms of control, these toxic pollutants are grouped into two categories:

- Carcinogenic Metals: Arsenic, Cadmium, Hexavalent Chromium and Nickel
- Organics and acids:
    - Acetaldehyde (used oil combustion only), a HAP
    - Dioxins and furans, when treated as a single TAP
    - Hydrochloric acid (used oil combustion only), a TAP
    - Poly-Aromatic Hydrocarbons (PAH), including formaldehyde, when treated as a single HAP
    - Polycyclic Organic Matter (POM) , when treated as a single TAP
    - Quinone (used oil combustion only), a HAP

06. Uncontrolled Ambient Concentration. ***(6-30-95)***
Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

07. Controlled Emissions and Uncontrolled Ambient Concentration. ***(6-30-95)***
Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

08. Controlled Ambient Concentration. ***(6-30-95)***
Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

09. Net Emissions ***(6-30-95)***
Net emissions are not considered in this permit.

10. Net Ambient Concentration. ***(6-30-95)***
Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

11. Toxic Air Pollutant Offset Ambient Concentration. ***(6-30-95)***
Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

12. T-RACT Ambient Concentration for Carcinogens. ***(6-30-95)***

a. *As provided in Subsections 210.12 and 210.13, the owner or operator may use T-RACT to demonstrate preconstruction compliance for toxic air pollutants listed in Section 586.* *(6-30-95)*

i. This method may be used in conjunction with netting (Subsection 210.09), and offsets (Subsection 210.11). *(6-30-95)*

Neither netting nor offsets are considered in this permit.

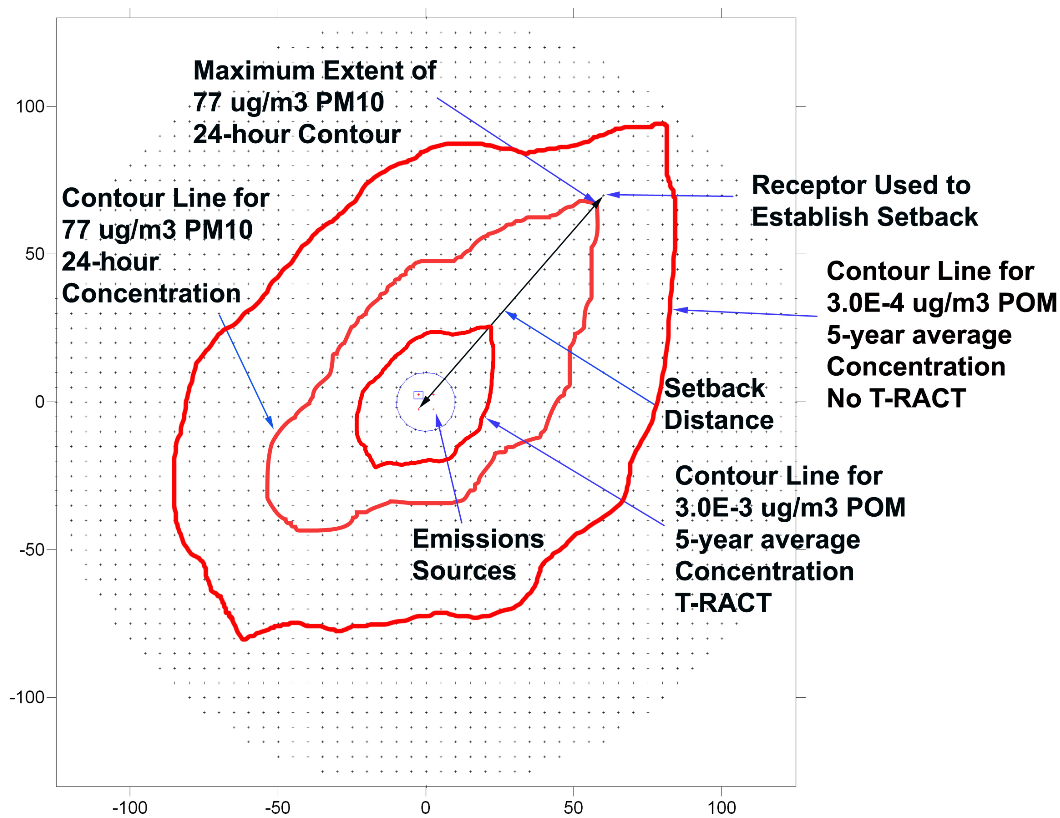
ii. This method is not to be used to demonstrate preconstruction compliance for toxic air pollutants listed in Section 585. *(6-30-95)*

Table 1 includes toxic air pollutants listed in either Section 585 or 586. Hydrochloric acid and quinone are listed in Section 585 and are not considered in this T-RACT analysis. T-RACT is being proposed for the toxic air pollutants listed in Section 586.

b. *Compare the source's or modification's approved T-RACT ambient concentration at the point of compliance for the toxic air pollutant to the amount of the toxic air pollutant that would contribute an ambient air cancer risk probability of less than one to one hundred thousand (1:100,000) (which amount is equivalent to ten (10) times the applicable acceptable ambient concentration listed in Section 586).* *(6-30-95)*

Under this permit, the ambient air quality impact analysis process is non-standard. In summary, the AACC is input to the impact analysis program to determine the distance required between the source and the point at which the ambient concentration has decreased to the AACC level. This point is called the “setback distance”. This procedure is applied for each pollutant which triggered the T-RACT analysis. This is the “T-RACT setback distance”. Refer to the following figure for a graphical representation.

Figure 1 - Determination of Setback Distance for a Modeling Run



Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

c. *If the source's or modification's approved T-RACT ambient concentration at the point of compliance is less than or equal to the amount of the toxic air pollutant that would contribute an ambient air cancer risk probability of less than one to one hundred thousand (1:100,000), no further procedures for demonstrating preconstruction compliance will be required for that toxic air pollutant as part of the application process.* *(6-30-95)*

As discussed previously, T-RACT setback distances are determined by the point at which the potential toxic air pollutant levels have dissipated to a concentration below the ambient air cancer risk probability of less than one to one hundred thousand (1:100,000). As shown in the previous figure, the setback distance required for proper dissipation of PM_{10} is generally greater than the setback distance required to satisfy T-RACT concerns. The largest setback distance, whether for T-RACT or PM_{10}, is set as the permitted setback distance. For details, refer to Appendix B of the Statement of Basis.

DEQ is satisfied that preconstruction compliance with toxic air pollutants listed in section 586 has

been demonstrated.

d. *The Department shall include emission limits and other permit terms for the toxic air pollutant in the permit to construct that assure that the facility will be operated in the manner described in the preconstruction compliance demonstration.* *(6-30-95)*

Table 2: Permit Conditions that Assure Compliance with Toxic Standards

TAP	Contributing source	Permit conditions
Metals	Drum mixer	Used oil (RFO) meeting the specifications of 279.11
Metals	Drum mixer	Use of baghouse with ≥ 99% PM_{10} control
Metals	Drum mixer	Recycling of particulate collected from the baghouse back to the drum mixer
Organics (formaldehyde)	Drum mixer and loadout and silo-filling	Use of a covered conveyor from the drum mixer to the loadout and silo-filling

13. T-RACT Determination Processing. ***(6-30-95)***

a. *The applicant may submit all information necessary to the demonstration at the time the applicant submits the complete initial application or the applicant may request the Department to review a complete initial application to determine if Subsection 210.12 may be applicable to the source or modification.* *(6-30-95)*

b. *Notwithstanding Subsections 209.01.a. and 209.01.b., if the applicant requests the Department to review a complete initial application and Subsection 210.12 is determined to be applicable, the completeness determination for the initial application will be revoked until a supplemental application is submitted and determined complete. When the supplemental application is determined complete, the timeline for agency action shall be reinitiated.* *(6-30-95)*

All of the documents submitted by the Applicant have been developed and reviewed by the Department.

14. T-RACT Determination. T-RACT shall be determined on a case-by-case basis by the Department as follows: ***(6-30-95)***

a. *The applicant shall submit information to the Department identifying and documenting which control technologies or other requirements the applicant believes to be T-RACT.* *(5-1-94)*

For the purposes of this analysis, the toxic air pollutants included in this analysis are grouped into two categories: metals (which are particulate); and organics (which are gaseous).

Metals, including arsenic, cadmium, hexavalent chromium, and nickel, may be contained in trace amounts in the liquid fuels. Liquid fuels may be combusted in the drum mixer, asphalt tank heater, and the IC engines. Metals, if present, exit the combustion units as particulate.

A DEQ review of previously submitted and online used oil analysis did not report nickel concentrations. DEQ is satisfied that the T-RACT controls for arsenic, hexavalent chromium, and nickel will also be appropriate for cadmium because all metals are carried with the particulate. Therefore, whatever control technology most reasonably controls particulate will satisfy T-RACT for cadmium.

Organics, including acetaldehyde, benzene, dioxins/furans, formaldehyde, PAH and POM, may be emitted either during combustion or during silo filling or load-out of the HMA product.

Based on a review of permitted facilities and research contained in the EPA Air Pollution Control Cost Manual (EPA/452/B-02-001), the following control technologies were reviewed:

Metals:

- Additional treatment of used oil by the supplier
- Drum mixer baghouse
- Drum mixer scrubber

Organics:

- Good combustion practices on all combustion devices
- Covered conveyors from the drum mixer to the silo or load-out points
- Thermal oxidizer on the asphalt storage silo
- Thermal oxidizer (RTO) on the exhaust of the drum mixer baghouse

b. *The Department shall review the information submitted by the applicant and determine whether the applicant has proposed T-RACT.* *(5-1-94)*

All of the documents submitted by the Applicant have been developed and reviewed by the Department. The Department is satisfied that the information provided in this document meets the requirements of a T-RACT analysis.

c. *The technological feasibility of a control technology or other requirements for a particular source shall be determined considering several factors including, but not limited to:* *(5-1-94)*

i. Process and operating procedures, raw materials and physical plant layout. *(5-1-94)*

ii. The environmental impacts caused by the control technology that cannot be mitigated, including, but not limited to, water pollution and the production of solid wastes. *(5-1-94)*

iii. The energy requirements of the control technology. *(5-1-94)*

Metals Control Technological Feasibility

Options considered for technological feasibility:

- Additional treatment of used oil (by the supplier)
- Drum mixer baghouse
- Drum mixer scrubber

Additional treatment on used oil:

The permit allows only the use of used oil classified as RFO4, RFO5l, and RFO5H (as defined by ASTM D6488); and 40 CFR 279.11 and ASTM 6448. Used oil is different from "waste oil" in that used oil is oil that is cleaned of impurities, including metals, and may be blended with other oil to provide for clean and consistent combustion.

i. Used oil suppliers are capable of supplying used oil with lower metals content. This treatment would not take place at the asphalt plant site.

ii. The used oil supplier would be responsible for the disposable of the extracted metals; therefore, this additional treatment would not have an environmental impact at the asphalt plant site.

iii. The used oil supplier is responsible for additional energy costs; therefore, this additional treatment would not increase energy consumption at the asphalt plant site.

Additional treatment on used oil to control metal emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

<u>Drum Mixer baghouse:</u>

i. For new installations, a baghouse is the preferred control device for a drum mixer. Baghouses are highly portable and considered as part of the typical installation.

- In December 2000, EPA-454/R-00-019, published the "Hot Mix Asphalt Plants Emission Assessment Report". Section 2.1.4 states: "At most HMA facilities, fabric filters (baghouses) are used to control emissions from dryers (drum mixers). The material collected in those devices is recycled back into the process."
- Two providers of drum mixer control equipment in Idaho no longer use scrubbers (per Dennis Hunt with Gencor Industries, Inc., and Catherine Sutton of Astec, Inc.)

ii. Baghouses are capable of providing ≥ 99% control of PM_{10}, i.e. metals control.

iii. The energy costs related to a baghouse system are less than those for scrubbers, per *Baghouse Applications* by Malcolm Swanson, P.E.

A drum mixer baghouse to control metal emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

Regardless of the T-RACT determination, the permit requires the operation of a baghouse on the exit of the drum mixer. In most operating scenarios, PM_{10} emissions from the drum mixer are the determining factor in calculating setback distance. This distance is minimized when the emissions from the drum mixer are controlled to ≥ 99% by a baghouse. The metals, which exist as particulate in the flue gas exiting the drum mixer, would be collected by this device.

<u>Recycle of particulate collected from drum mixer baghouse:</u>

The permit also requires that the collected particulate be routed back to the drum mixer. In this manner, the metals that may be contained in the particulate are encapsulated into the hot mix and not released to the atmosphere.

Recycling of particulate collected from the drum mixer baghouse to control metal emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

<u>Drum mixer scrubber:</u>

i. Particulate may be captured by a wet scrubber system. For a 130 T/day drum mixer, approximately 100 gallons per minute of water would be required. Particulate collection efficiency varies from 50 to 98% depending on particle size and pressure drop. The scrubbing water would be treated and recycled through some type of mechanical and/or chemical means. It is possible for a portable HMA to construct a wastewater collection

system at each site. However, several of the major HMA plant manufacturers, including Gencor and Astec, no longer use scrubber control systems

ii. Wastewater stored in a pond would require on-going, supervised treatment, even after the HMA plant relocates. There is a possibility of ground water or surface water contamination.

iii. The energy costs related to waste water treatment vary depending on a variety of factors including: volume of water; concentration of pollutants in the water; weather; and pond design.

A drum mixer scrubber to control metal emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

Review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) Review for Metals

The engineering consulting firm CH2MHill, Boise, has presented this review to the Department on behalf of their clients on several previous occasions. The Department continues to be satisfied with the completeness of this review as submitted.

"A review of technologies for the control of chromium, arsenic and nickel was performed. The Environmental Protection Agency (EPA) RBLC was reviewed for a 10 year look-back period to determine the types of controls that have been required on similar sources. The RBLC is a compilation of existing and proposed control technologies, permit limits, and emission estimates for a very wide variety of process and emission point sources in the U.S. This database was developed and is maintained by the EPA to provide information on emissions control technology and other information for air pollutants and is regularly updated by EPA and state regulatory agencies to reflect the current state of controls. The RBLC was reviewed for HMA plants and searched for other related categories, such as external combustion. The categories searched of the in the RBLC were:

- Asphalt Concrete Manufacturing
- Asphalt Processing
- Liquid Fuel & Liquid Fuel Mixtures (< 100 million Btu/hr)
- Distillate Fuel Oil (ASTM # 1,2, includes kerosene, aviation, diesel fuel)
- Other Liquid Fuel & Liquid Fuel Mixtures
- Other Fuel and Combinations (< 100 million Btu/hr)

For each category listed above, the RBLC was used to search for records relating to the control of arsenic and chromium specific to asphalt processing and manufacturing (mineral products) or related to fuel combustion. Based on a 10 year review of related sources, no controls were identified for HMA plants for the control of chromium, arsenic and nickel. A copy of the results of the RBLC search was included in the April, 2008 permit application submitted to DEQ. Based on the search, removal controls for chromium, arsenic and nickel were not determined to be present in the source categories and no additional controls, beyond the high-efficiency baghouse are considered reasonable."

DEQ is satisfied that the review results for the metal particulates of chromium, arsenic and nickel is also appropriate for cadmium metal particulate.

Organic Control Technological Feasibility

Options considered for technological feasibility:

- Good combustion practices on all combustion devices
- Covered conveyors from the drum mixer to the silo or load-out points
- Thermal oxidizer on the asphalt storage silo
- Thermal oxidizer following the drum mixer baghouse

<u>Good combustion practices on all combustion devices:</u>

i. Fuel cost is one of the major expenses at any HMA plant. Efficient combustion reduces costs, while also reducing organic emissions. Process operation and maintenance procedures are in place to ensure good combustion practices.

ii. The practice of good combustion practices does not adversely impact the environment.

iii. Good combustion practices reduce energy costs.

Good combustion practices on all combustion devices to control organic emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

<u>Covered conveyors from the drum mixer to the silo or load-out points:</u>

Organics, generally referred to as "blue smoke", are generated by the hot asphalt product as it is conveyed from the drum mixer to the silo. Blue smoke is actually a haze of petroleum (organic) droplets suspended in the air.

i. Covering this conveyor protects the HMA product from airborne contaminants and helps to maintain the temperature of the HMA product.

ii. This covering and reduces the droplets from escaping to the environment. It is considered an inexpensive "good neighbor" control for potential blue smoke.

iii. Construction of this covering may provide a slight energy savings.

Covering the conveyors from the drum mixer to the silo or load-out points to control organic emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

<u>Thermal oxidizer on the asphalt storage silo:</u>

Incineration is one of the best known methods of industrial gas waste disposal. Incineration is the ultimate disposal method in that the objectionable combustible compounds in the waste gas are converted rather than collected. The heart of an incinerator system is a combustion chamber in which the organic-containing waste stream is burned. However, the energy released by the combustion of the organics is not sufficient to raise its own inlet temperature to the desired levels, so that supplemental air and auxiliary fuel must be added.

The use of a catalyst increases the reaction rate, enabling conversion at lower reaction temperature than in thermal incinerator units, and thereby lowering the fuel costs. However, particulate matter and the metals can rapidly blind the pores of catalysts and deactivate them over time. The use of a catalyst in a thermal oxidizer will not be further explored

i. The incinerator chamber and auxiliary equipment require their own foundations & supports, instrumentation, electrical, piping, insulation, and extensive handling & erection by specially trained personnel.

ii. The organics entering the oxidizer would be destroyed.

iii. This process requires additional energy. The auxiliary fuel of choice for a thermal oxidizer is natural gas because the combustion of any liquid fuels would create additional pollutants, including organic compounds.

Thermal oxidizer on the asphalt storage silo to control organic emissions **does not** meet the criteria for technological feasibility and only a brief discussion of economic feasibility will be presented.

Thermal oxidation following the drum mixer baghouse:

A thermal oxidizer could potentially be installed following the drum mixer baghouse. However, all of the concerns regarding this device on the silo apply to the baghouse exhaust as well.

Thermal oxidation following the drum mixer baghouse to control organic emissions **does not** meet the criteria for technological feasibility and only a brief discussion of economic feasibility will be presented.

EPA RACT/BACT/LAER Clearinghouse Review and AP-42

The engineering consulting firm CH2MHill, Boise, has presented this review to the Department on behalf of their clients on several previous occasions. The Department continues to be satisfied with the completeness of this review as submitted:

"A review of technologies for the control of formaldehyde, POM and PAH was performed. The Environmental Protection Agency (EPA) RACT/BACT/LAER Clearinghouse (RBLC) was reviewed to determine the types of controls that have been required on similar sources. The same source categories were reviewed for the pollutants, namely:

- Asphalt Concrete Manufacturing
- Asphalt Processing
- Liquid Fuel & Liquid Fuel Mixtures (< 100 million Btu/hr)
- Distillate Fuel Oil (ASTM # 1,2, includes kerosene, aviation, diesel fuel)
- Other Liquid Fuel & Liquid Fuel Mixtures
- Other Fuel and Combinations (<100 million Btu/hr)

This review returned one record for limitations of formaldehyde emissions, and no records for the specific control of POM/PAH.

Formaldehyde – Only one record for the control of emissions was found in the RBLC database. This record applied to a diesel generator which was assigned an emissions limit and no control equipment or work practice was required.

In addition to formaldehyde and POM/PAH discussed in the EPA RBLC investigation above, this T-RACT analysis needs to address the other organic compounds which exceeded the 586 ELs; i.e. acetaldehyde, benzene, and dioxins/furans. Because all organic compounds are the destroyed by the same devices, DEQ is satisfied that the review results for formaldehyde and POM/POH is appropriate for all organic compounds.

14. T-RACT Determination. T-RACT shall be determined on a case-by-case basis by the Department as follows: (continued)

d. *The economic feasibility of a control technology or other requirement, including the costs of necessary mitigation measures, for a particular source shall be determined considering several factors including, but not limited to:* *(5-1-94)*

i. Capital costs. *(5-1-94)*

ii. Cost effectiveness, which is the annualized cost of the control technology divided by the amount of emission reduction. *(5-1-94)*

iii. The difference in costs between the particular source and other similar sources, if any, that have implemented emissions reductions. *(5-1-94)*

Cost Analysis Metals

Additional treatment of used oil by the supplier:

A used oil vendor, Commercial Fuel in Nampa, Idaho was contacted by the engineering consulting firm CH2MHill, Boise, for the specific management of used oil to minimize the content of **chromium and arsenic**. Note that all chromium compounds, not the subset of hexavalent chromium, are considered in these cost calculations because 279.11 does not distinguish between the two.

Randy Blackburn of Commercial Fuel indicated that the used oil could be managed to minimize the metals content for an additional cost of $0.55/gallon.

A RFO fuel vendor, Gem State Oil Recovery in Kuna, Idaho was contacted by the engineering consulting firm CH2MHill, Boise, for the specific management of used oil to minimize the content of **nickel**. Doug Stowers of Gem State Oil Recovery indicated that the used oil could be managed to minimize the metals content for an additional cost of $0.55/gallon.

Minimum detection limits (MDLs) vary, even at the same laboratory and with the same equipment, due to calibration procedures. A review of used oil analysis online and submitted to the Department indicated MDLs between 0.5 and 1.0 ppm (mg/l). For consistency, the cost calculations are based on 1.0 ppm for each of the metals.

As shown in the following table, the reduction of the metal pollutant is calculated as the difference between the used oil as-received and the used oil after additional treatment. Because 279.11 does not specify a concentration for nickel, the cost analysis conclusions for the other metals is considered appropriate for nickel.

For details of this economic analysis, refer to the spreadsheet "Additional Treatment on Used Oil Cost Analysis" provided in Sub Appendix A. The results are summarized in the following table:

Table 3: Additional Treatment on Used Oil Cost Analysis

Pollutant	Capital Cost for Applicant ($)	Annualized Cost ($/lb reduction of pollutant)
Arsenic	0	$16,487
Cadmium	0	$65,947
Chromium	0	$7,327

Additional treatment on used oil to reduce metal particulate emissions is not considered economically feasible and therefore does not meet the economic requirements of T-RACT.

Drum Mixer controls:

Calculation of the cost effectiveness of each type of control equipment on metals exiting the drum mixer:

- Metal emissions entering the control device: the AP-42 uncontrolled emissions with fuel oil (Table 11.1-12).
- Metal emissions exiting the control device: the control device manufacturer's particulate control efficiencies
- Emission reductions and annual cost per ton of emission reduction: based on the difference between the emissions entering and exiting the device (as explained in the previous two bullets)

Equipment costs for both the baghouse and scrubbers systems were provided to the Department by Andy Guth of CEI Enterprises, Inc., an Astec Company. For cost details of this economic analysis, refer to the spreadsheet "Drum Mixer Baghouse and Scrubber Cost Analysis" provided in Sub Appendix B. The results are summarized in the following table:

Table 3: Drum Mixer Baghouse and Scrubber Cost Analysis

Pollutant	**Capital Cost**		**Annualized Cost (\$/lb reduction of pollutant)**	
	Baghouse	Scrubber	Baghouse	Scrubber
Arsenic	\$264,990	\$231,110	\$284,750	\$281,220
Cadmium			\$94,917	\$93,740
Hexavalent chromium			\$14,987	\$15,623
Nickel			\$284	\$289

Cost effectiveness:

The Department is satisfied that the operation of a baghouse on the drum mixer to reduce metal particulate meets the T-RACT criteria for economic feasibility.

As explained in the Statement of Basis, this permit requires the operation of a baghouse on the drum mixer with ≥ 99% control efficiency of PM_{10}.

<u>Cost Analysis Organic Control</u>

<u>Covered conveyors from the drum mixer to the silo or load-out points:</u>

As discussed in "Organics Control – Technological Feasibility", covered conveyors from the drum mixer to the silo or load-out points to control organic emissions meets the T-RACT criteria for technological feasibility and will be considered for economic feasibility.

Covered conveyors are a standard on most HMA plant systems in order to shield the HMA product from the weather, maintain temperature, and minimize the release of organic droplets. Cost itemization for the covering and the exact quantity of emissions reduction is not provided with manufacturer quotes. The quote does specify that the cover is composed of a series of hinged steel plates, about 18 inches wide over the length of the conveyor.

For this T-RACT analysis, the following table is considered by the Department to be reasonable:

Table 4: Covered Conveyors from the Drum Mixer to the Silo or Load-out Points Cost Analysis

Pollutant	**Capital Cost**	**Annualized Cost (\$/lb reduction of pollutant)**
Organic	minimal	Negligible

Cost effectiveness:

The Department is satisfied that the cost of covering the conveyor(s) from the drum mixer to the silo or load-out point to reduce organic emissions meets the T-RACT criteria for economic feasibility.

Thermal Oxidizer on the Silo or Load-Out Points and Thermal Oxidation Following the Drum Mixer Baghouse

As discussed in "Organics Control – Technological Feasibility", installing a thermal oxidizer on either the silo or load-out points or the discharge of a drum mixer baghouse to control organic emissions **does not** meet the criteria for technological feasibility for this T-RACT analysis. However, a brief discussion of economic feasibility is presented.

The engineering consulting firm CH2MHill, Boise contacted the vendor Baker Furnace, in Yorba Linda CA, (Gabe Trinidad, 800-237-5675) for information regarding a thermal oxidizer on the silo or load-out points. The following information was presented in multiple permit applications in 2008 and 2009:

- The capital cost estimate to accommodate 5,000 acfm was $462,875 (2005$).
- Annualized cost was $171,684 (2005$)

To obtain an order of magnitude cost estimate, the above annualized cost (based on a different size asphalt storage silo) and formaldehyde (at 0.018 lb/hr, the 586 pollutant with the highest concentration discharged from the drum mixer, as presented in Table 1) on the silo or load-out points.

Table 5: Thermal Oxidizer on the Silo or Load-out Points Cost Analysis

Pollutant	Capital Cost	Annualized Cost ($/lb reduction of pollutant)
Formaldehyde	$462,875	$25,715,278

The engineering consulting firm CH2MHill, Boise contacted the vendor CMM Group, DePere WI, (David Martin, 920-336-9800) for information regarding a thermal oxidizer on the discharge of the drum mixer. The following information was presented in multiple permit applications in 2008 and 2009:

- The capital cost estimate to accommodate 35,000 acfm at 1400-1600 °F was $425,000 (2005$).
- Annualized cost was $452,355

To obtain an order of magnitude cost estimate, the above annualized cost (based on a different size drum mixer) and formaldehyde (at 0.018 lb/hr, the 586 pollutant with the highest concentration discharged from the drum mixer, as presented in Table 1) are used to calculate the annualized cost of installing thermal oxidation following the drum mixer.

Table 6: Thermal Oxidizer on the Discharge of the Drum Mixer Baghouse Cost Analysis

Pollutant	Capital Cost	Annualized Cost ($/lb reduction of pollutant)
Formaldehyde	$786,888	$43,716,000

Cost effectiveness:

Thermal oxidation on the asphalt to control organic emissions **does not** meet the criteria for economic feasibility. Thermal oxidation on the exhaust of the drum mixer baghouse to control organic emissions **does not** meet the criteria for economic feasibility.

14. T-RACT Determination. T-RACT shall be determined on a case-by-case basis by the Department as follows: (continued)

e. *If the Department determines that the applicant has proposed T-RACT, the Department shall determine which of the options, or combination of options, will result in the lowest emission of toxic air pollutants, develop the emission standards constituting T-RACT and incorporate the emission standards into the permit to construct.* *(5-1-94)*

f. *If the Department determines that the applicant has not proposed T-RACT, the Department shall disapprove the submittal. If the submittal is disapproved, the applicant may supplement its submittal or demonstrate preconstruction compliance through a different method provided in Section 210. If the applicant does not supplement its submittal or demonstrate preconstruction compliance through a different method provided in Section 210, the Department shall deny the permit.* *(6-30-95)*

Based on this T-RACT analysis, the Department has determined that the proposed control technologies constitute T-RACT for this permit.

Table 7: Permit Conditions that Assure Compliance with Toxic Standards

TAP	Contributing source	Permit conditions
Metals	Drum mixer	Used oil (RFO) meeting the specifications of 279.11
Metals	Drum mixer	Use of baghouse with ≥99% PM_{10} control
Metals	Drum mixer	Recycling of particulate collected from the baghouse back to the drum mixer
Organics (formaldehyde)	Drum mixer and loadout and silo-filling	Use of a covered conveyor from the drum mixer to the loadout and silo-filling

T-RACT for Asphaltic Oil Tank Heaters:

Asphaltic oil tank heaters have one available control technology; the burner. The burner can be designed for complete combustion to make fuel burning more efficient, cost-effective, and minimize particulate matter. A low-NO_X burner can also be installed; however this burner can only reduce NO_X emissions. In this analysis nickel is the only air pollutant of concern and a Webster burner with advanced control technology with proven combustion performance to improve boiler efficiency has already been installed. Therefore there are no other feasible control technologies available to reduce the nickel emissions from the asphaltic oil tank heater.

T-RACT for IC Engines:

All applicants who choose to permit a portable asphalt plant are required to comply with 40 CFR 60 Subpart IIII or 40 CFR 63 Subpart ZZZZ. Both of these subparts are intended to reduce emissions, including Idaho TAP/HAP emissions from engines through emission standards, fuel limitations and specific operation and maintenance procedures.

Per IDAPA 58.01.01.210.20 compliance with these two MACT subparts constitutes T-RACT for the IC engines.

T-RACT Analysis
Sub Appendix A

Additional Treatment of Used Oil Cost Analysis

T-RACT Analysis
Sub Appendix B

Drum Mixer Baghouse and Scrubber Cost Analysis

130 T/hr Drum Mixer - Scrubber T-RACT Cost Analysis

Cost Item	Multiplier	Cost
Direct Purchase Costs		
Venturi Packaged Unit, A1*		$100,000
Instrumentation, 0.1 x A	10.00%	$10,000
Sales tax, 0.06 x A	6.00%	$6,000
Freight, 0.05 x A	5.00%	$5,000
Purchased equipment cost "B"is the cost of the baghouse + instrumentation + sales tax + freight		**$121,000**
Direct Installation Costs		
Foundation and supports, 0.06 x B	6.00%	$7,260
Handling and erection, 0.40 x B	40.00%	$48,400
Electrical, 0.01 x B	1.00%	$1,210
Piping, 0.05 x B	5.00%	$6,050
Insulation for ductwork, 0.03 x B	3.00%	$3,630
Painting, 0.01 x B	1.00%	$1,210
Direct installation costs total		**$67,760**
Site preparation**		$0
Facilities and buildings**		$0
Total Direct Costs		**$188,760**
Indirect costs (installation)		
Engineering, 0.10 x B	10.00%	$12,100
Construction and field expenses, 0.10 x B	10.00%	$12,100
Contractor fees, 0.10 x B	10.00%	$12,100
Startup, 0.01 x B	1.00%	$1,210
Performance test, 0.01 x B	1.00%	$1,210
Contingencies, 0.03 x B	3.00%	$3,630
Total Indirect Cost		**$42,350**
Total Capital Investment (TCI) is Total Direct Costs + Total Indirect Costs		**$231,110**
Direct Annual Costs, DC		
Operating labor cost (assumption)	$35.00/hr	
Annual operation (assumption)	6,000 hrs/yr	
Operating labor cost (assumed to be 25% of annual operation, 2 hrs per 8 hr shift)	25.00%	$52,500
Supervisory labor cost (15% of operating labor)	15.00%	$7,875
Operating materials cost**		$0
Maintenance labor cost (assumed to be 18.75% of annual operation, 1-2 hr per 8 hr shift, thus an average of 1.5 hrs per 8 hr shift)	18.75%	$39,375
Maintenance material cost (assumed to be 100% of maintenance labor cost)	100.00%	$39,375
Liquor pump power rating	10.00 hp	
Auger pump power rating	3.00 hp	

Fan power rating	75.00 hp	
Conversion from horsepower to kW	0.7457	
Utilities price	0.07 $/kW-hr	
Utilities cost (electricity), annual operation x motor rating x electricty cost		$27,561
Total Direct Annual Costs		**$166,686**

<u>Indirect Annual Costs</u>

Overhead, 60% of the sum of operating, supvisory & maintenance labor and maintenance materials	60.00%	$83,475
Administrative charges, 2% of TCI	2.00%	$4,622
Property tax, 1% of TCI	1.00%	$2,311
Insurance, 1% of TCI	1.00%	$2,311
Capital recovery, 0.09439 x TCI	9.439%	$21,814
Total Indirect Annual Costs		**$114,534**
Total Annual Cost is Total Direct Annual Costs + Total Indirect Annual Costs		**$281,220**

<u>Annual Cost Per Ton of Pollutant Removed</u>

Pollutant	**Pounds per year of pollutant controlled by the scrubber (96% control)**	**Annual Cost to capture pollutant ($/lb)**
Arsenic	1	**281,220 $/lb**
Cadmium	3	**93,740 $/lb**
Hexavalent Chromium	18	**15,623 $/lb**
Nickel	973	**289 $/lb**

*Reference:
EPA AIR POLLUTION CONTROL COST MANUAL
Sixth Edition - January 2002
EPA/452/B-02-001
United States Environmental Protection Agency
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711
Section 6, Particulate Matter Controls, Chapter 2,
Wet Scrubbers for Particulate Matter
Table 2.8 and 2.9

**Section 2.3.5, Waste Liquid Collection and Disposal, states that due to the high variability of disposal costs, i.e. laboratory analysis, transportation costs, and the cost of treatment, destruction, landfill, or other disposal metod of the spent scrubber water, these costs are not included as part of annual costs in this document.

Vendor quotes from: CEI Enterprises, Inc., An Astec Company
CEI Proposal # 10-421
Dated October 2, 2010

APPENDIX D – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

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

Company:	**Sunroc Corporation dbs Depatco, Inc.- 00430**
Address:	**730 N 1500 W**
City:	**Oren**
State:	**Utah**
Zip Code:	**84057**
Facility Contact:	**Kamren Garfield**
Title:	**Environmental Specialist**
AIRS No.:	**324121**

Y	Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N
Y	Did this permit require engineering analysis? Y/N
N	Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	8.7	0	8.7
SO_2	15.8	0	15.8
CO	18.5	0	18.5
PM10	3.4	0	3.4
VOC	4.9	0	4.9
Total:	51.3	0	**51.3**
Fee Due	**$ 500.00**		

Comments: