Statement of Basis

Permit to Construct No. P-2013.0059
Project ID 61908

Northwest Gas Processing, LLC
New Plymouth, Idaho

Facility ID 075-00021

Final

October 27, 2017
Kelli Wetzel KW
Permit Writer

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

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAA	Clean Air Act
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
GHG	greenhouse gases
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
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
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
NSCR	non-selective catalytic reduction
NSPS	New Source Performance Standards
O&M	operation and maintenance
O_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
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
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
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
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

Northwest Gas Processing, LLC (NWGP) operates a natural gas and hydrocarbon treatment facility called the NWGP Highway 30 Treating Facility located in New Plymouth. The facility processes raw natural gas and natural gas condensate for delivery to a nearby Williams Northwest natural gas transmission pipeline for transport to market.

Raw field gas enters the plant through a gathering line and ball receiver. Liquids are separated from the gas in the Slug Catcher, and level controlled through a level control valve where they are pressured to a storage tank. The gas vapor leaving passes through a pressure control valve which prevents the pressure from exceeding 575 psig. It next enters the Gas to Gas Exchanger where the gas is cooled to 17 F and then to the Gas Chiller, where the gas is further cooled to -20 F using propane refrigerant. The gas is separated from the condensed natural gas liquids in the Cold Separator, and then delivered to shell side of the Gas to Gas Exchanger and consequently warmed to 50 F. This gas is approximately 95% of the inlet gas and is compressed to pipeline pressure (maximum 850 psig) by compressors. The compressors are driven by four natural gas powered engines. There are two 0.2 MMbtu Engine heaters which are also natural gas fired which can be used to warm the engine prior to start-up. The gas then passes through a Filter/Separator to remove particles, oil mist, etc. prior to delivery to Northwest Pipeline.

Liquids from the cold separator flow to the Gas/Liquid Exchanger, where they are warmed to 31 F. The flow is level controlled by a level control valve prior to entering the Glycol Separator. The Glycol Separator is a three phase separator and separates gas, natural gas liquids NGL(s), and glycol. The NGL(s) enter the top of the 10 tray stabilizer and trickle down through the trays. The bottom section of the stabilizer diverts the NGL(s) to the Reboiler, where indirect heat warms the NGL(s) to 180 F. This reboiler (Stabilizer Reboiler Heaters) are a 1500 Mbtu natural gas fired units which vaporize the ethane and lighter components which travel from tray to tray up the tower warming the incoming NGL(s) and cooling the gas. The gas leaving the stabilizer is ethane rich and is recompressed back to the plant inlet.

The NGL is cooled in an air cooled heat exchanger, as it passes to the storage tank. All vapors are combined and recompressed to the plant inlet for recycling. The fourth throw of the refrigeration compressor is powered by a 250 hp electric motor.

Ethylene glycol is injected in the gas to gas exchanger and the chiller to inhibit hydrate formation as the inlet gas is cooled. The glycol travels through a series of exchangers and separators where it is separated by gravity from the NGL(s). Glycol exits the glycol separator and travels to a heat exchanger where it is warmed to 100 F by exchange with the hot glycol from the reboiler. This conserves energy and reduces viscosity for improved operation of the glycol filter. The glycol filter has a spun element and removes particles in the glycol 25 micron and larger. The filter is equipped with an air eliminator to remove vapor and maximize the filtration area.

The warm glycol then flows to the top of the packed section of the glycol reboiler where it acts as reflux for the steam generated in the reboiler to minimize glycol vaporization losses. The glycol is heated in two reboilers by two 750 Mbtu per hour direct natural gas fired tubes. By operating the reboilers at 235 to 240 F the glycol will maintain a concentration in the 75% range.

Hot glycol from the reboiler accumulates in the surge tank end of the reboiler and then flows to the shell side of the glycol exchanger where it cools to ambient temperature for suction to the glycol pump. The glycol pump is an electric motor driven plunger type which can boost the glycol up to 1000 psig if necessary. Glycol leaving the pump flows to the injection nozzles which are each sized for 1 gpm a 50 psi differential pressure. The nozzles are inserted into the exchangers with removable holders. Operating under the proper conditions the glycol should be evenly distributed across the face of each tubesheet.

The refrigeration is provided in a typical propane/kettle type system. The compressor lowers the pressure of the kettle thereby lowering the temperature of the bath. Propane from the kettle is compressed to 240 psig by a two stage compressor which is equipped with normal operating and shutdown devices. Propane from compressor discharge is condensed with an aerial electric fan driven cooler. The cooler outlet liquids flow to the propane accumulator.

Propane leaves the accumulator and flows to the liquid/liquid exchanger where it is further cooled by the cold NGL(s). A liquid level control valve maintains the propane level in the chiller.

The propane compressor is driven by a 250 HP electric motor. Fluctuations in the refrigeration load are controlled with a hot gas bypass from compressor discharge to the chiller propane inlet thereby maintaining a minimum suction pressure for the compressor.

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).

July 11, 2014	P-2013.0059, Initial permit to construct, Permit status (S)
October 27, 2014	P-2013.0059, PTC revision to remove one compressor engine, install one condensate heater and a series of ten condensate storage tanks, and install an emergency flare, Permit status (S)
February 5, 2015	P-2013.0059, PTC revision to install and operate an additional reboiler, condensate heater, and emergency flare, Permit status (S)
April 10, 2015	P-2013.0059, PTC revision for a facility name change, Permit status (A, but will become S upon issuance of this permit)

Application Scope

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

The applicant has proposed to:

- Install and operate three additional compressor engines and two heaters;
- Convert two existing flares from emergency use to process use.

Application Chronology

June 13, 2017	DEQ received an application and an application fee.
June 21 – July 7, 2017	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
July 13, 2017	DEQ determined that the application was complete.
August 11, 2017	DEQ made available the draft permit and statement of basis for peer and regional office review.
August 18, 2017	DEQ made available the draft permit and statement of basis for applicant review.
September 13 – October 13, 2017	DEQ provided a public comment period on the proposed action.
September 5, 2017	DEQ received the permit processing fee.
October 27, 2017	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment
Compressor Engine ENG1	Manufacturer: Caterpillar Model: G398 TA HCR Manufacture Date: 4/5/1990 Max. capacity: 610 bhp Fuel: Natural Gas	NSCR
Compressor Engine ENG2	Manufacturer: Caterpillar Model: G398 TA HCR Manufacture Date: Unknown Max. capacity: 610 bhp Fuel: Natural Gas	NSCR may be utilized as required to meet the requirements of 40 CFR 63 Subpart ZZZZ
Compressor Engine ENG3	Manufacturer: Caterpillar Model: G3516B Manufacture Date: Unknown Max. capacity: 1380 bhp Fuel: Natural Gas	NSCR may be utilized as required to meet the requirements of 40 CFR 63 Subpart ZZZZ
Compressor Engine ENG4	Manufacturer: Caterpillar Model: G398 TA HCR Manufacture Date: Unknown Max. capacity: 203 bhp Fuel: Natural Gas	None
(2) Reboilers RBLR-HTR1 & 2	Rated capacity: 0.75 MMBtu/hr Fuel: Natural Gas	None
(2) Stabilizer Reboiler Heaters STBL-HTR1 & 2	Rated capacity: 1.5 MMBtu/hr Fuel: Natural Gas	None
(2) Engine Heaters ENG-HTR1 & 2	Rated capacity: 0.2 MMBtu/hr Fuel: Natural Gas	None
(2) Condensate Heaters COND-HTR1 & 2	Rated capacity: 1.5 MMBtu/hr Fuel: Natural Gas	None
(2) Flares, one high pressure and one low pressure FLR1 & 2	Manufacturer: Flare Industries Model: 850 Throughput: 126,000 scf/day	None (considered an emission control device with control efficiency of 98%)
10 Condensate Storage Tanks VENTK	Throughput: 1800 bbl/day Fuel: Crude Oil RVP 10	VRU System Control Efficiency 98.0%
Tank Truck Loading LU1	Throughput: 1800 bbl/day 5000 gal/hr	VRU System Control Efficiency 98.0%

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 four compressor engines, two engine heaters, two reboilers, two stabilizer reboiler heaters, two condensate heaters, and two emergency flares at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant, greenhouse gases (GHG), hazardous air pollutants (HAP), and toxic air pollutants (TAP) were based on emission factors from AP-42, operation of 8,760 hours per year, and process information specific to the facility for this proposed project. Tank emissions and truck loading emissions are still included in the emission inventory but are included under the flare emission totals as emissions are routed to the process flares from the VRU system.

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 and GHG 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 2 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	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)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
ENG1	0.045	0.198	0.045	0.198	0.003	0.012	1.34	5.89	1.34	5.89	0.672	2.94	505.3	2213.2
RBLR-HTR1	0.0046	0.020	0.0035	0.015	0.0004	0.0016	0.061	0.267	0.051	0.224	0.0034	0.015	79.6	348.7
RBLR-HTR2	0.0046	0.020	0.0035	0.015	0.0004	0.0016	0.061	0.267	0.051	0.224	0.0034	0.015	79.6	348.7
STBL-HTR1	0.007	0.033	0.006	0.024	0.001	0.003	0.098	0.427	0.082	0.359	0.005	0.024	127.4	557.9
ENG-HTR1	0.001	0.005	0.001	0.004	0.0001	0.0004	0.016	0.071	0.014	0.060	0.0009	0.004	21.2	93.0
COND-HTR1	0.009	0.040	0.007	0.030	0.0007	0.003	0.122	0.534	0.102	0.449	0.007	0.029	159.2	697.4
COND-HTR2	0.009	0.040	0.007	0.030	0.0007	0.003	0.122	0.534	0.102	0.449	0.007	0.029	159.2	697.4
FLR1	0.0001	0.0004	0.000	0.000	0.0001	0.0004	0.012	0.054	0.024	0.107	0.003	0.012	9.6	41.9
FLR2	0.0001	0.0004	0.000	0.000	0.0001	0.0004	0.012	0.054	0.024	0.107	0.003	0.012	9.6	41.9
VENTK	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.195	0.855	0.000	0.000
LU1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.534	0.637	0.000	0.000
Pre Project Totals	**0.08**	**0.36**	**0.07**	**0.32**	**0.007**	**0.025**	**1.84**	**8.10**	**1.79**	**7.87**	**1.43**	**4.57**	**1150.6**	**5039.9**

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

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

The following table presents the post project Potential to Emit for criteria and GHG 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 3 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	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)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
ENG1	0.09	0.40	0.09	0.40	0.003	0.01	1.34	5.89	1.34	5.89	0.67	2.94	505.3	2213.2
ENG2	0.09	0.40	0.09	0.40	0.003	0.01	1.34	5.89	1.34	5.89	0.67	2.94	505.3	2213.2
ENG3	0.22	0.97	0.22	0.97	0.007	0.03	3.04	13.31	3.04	13.31	1.52	6.66	1204.9	5277.6
ENG4	0.03	0.14	0.03	0.14	0.0009	0.004	0.45	1.96	0.89	3.92	0.16	0.69	169.7	743.4
RBLR-HTR1	0.0046	0.020	0.0035	0.015	0.0004	0.0016	0.061	0.267	0.051	0.224	0.0034	0.015		
RBLR-HTR2	0.0046	0.020	0.0035	0.015	0.0004	0.0016	0.061	0.267	0.051	0.224	0.0034	0.015		
STBL-HTR1	0.009	0.04	0.007	0.03	0.0007	0.003	0.12	0.53	0.10	0.45	0.007	0.03		
STBL-HTR2	0.009	0.04	0.007	0.03	0.0007	0.003	0.12	0.53	0.10	0.45	0.007	0.03	838.5	3672.8
ENG-HTR1	0.001	0.005	0.001	0.004	0.0001	0.0004	0.016	0.071	0.014	0.060	0.0009	0.004		
ENG-HTR2	0.001	0.005	0.001	0.004	0.0001	0.0004	0.016	0.071	0.014	0.060	0.0009	0.004		
COND-HTR1	0.009	0.040	0.007	0.030	0.0007	0.003	0.122	0.534	0.102	0.449	0.007	0.029		
COND-HTR2	0.009	0.040	0.007	0.030	0.0007	0.003	0.122	0.534	0.102	0.449	0.007	0.029		
FLR1	0.01	0.04	0.01	0.04	0.003	0.01	0.40	1.77	1.84	8.08	1.15	5.06	631.3	2765.1
FLR2	0.01	0.04	0.01	0.04	0.003	0.01	0.61	2.65	2.76	12.08	5.15	22.55	944.0	4134.8
Post Project Totals	**0.50**	**2.20**	**0.49**	**2.15**	**0.02**	**0.09**	**7.82**	**34.27**	**11.74**	**51.54**	**9.36**	**41.0**	**4799**	**21020**

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.

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 4 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	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	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	0.081	0.358	0.073	0.317	0.007	0.025	1.84	8.10	1.79	7.87	1.43	4.57	1150.6	5039.9
Post Project Potential to Emit	0.50	2.20	0.49	2.15	0.02	0.09	7.82	34.27	11.74	51.54	9.36	41.0	4799	21020
Changes in Potential to Emit	**0.42**	**1.84**	**0.41**	**1.83**	**0.02**	**0.07**	**5.98**	**26.17**	**9.95**	**43.67**	**7.93**	**36.43**	**3648**	**15980**

Non-Carcinogenic TAP Emissions

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

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

Table 5 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)
Acrolein	0.0245	0.1155	0.0910	0.017	Yes
Biphenyl	0.0010	0.0048	0.0038	0.1	No
Chlorobenzene	0.0001	0.0007	0.0005	23.3	No
Chloroethane	0.0000	0.0000	0.0000	27	No
Cyclopentane	0.0011	0.0051	0.0040	114.67	No
Cyclohexane	0.0000	0.0112	0.0112	70	No
1,2-dichloropropane	0.0001	0.0006	0.0005	23.133	No
Ethylbenzene	0.0002	0.0033	0.0031	29	No
Heptane	0.0174	0.3257	0.3083	109	No
n-Hexane	0.0162	0.2566	0.2403	12	No
Methanol	0.0146	0.0688	0.0542	17.3	No
Methylcyclohexane	0.0059	0.0354	0.0296	107	No
Naphthalene	0.0005	0.0022	0.0017	3.33	No
n-Nonane	0.0005	0.0237	0.0232	70	No
n-Octane	0.0017	0.0953	0.0936	93.3	No
n-Pentane	0.0372	0.5682	0.5310	118	No
Phenol	0.0001	0.0005	0.0004	1.27	No
Toluene	0.0029	0.0187	0.0158	25	No
2,2,4-Trimethylpentane	0.0017	0.0056	0.0039	23.3	No
Xylene	0.0011	0.0103	0.0092	29	No

One of the PTEs for non-carcinogenic TAP was exceeded as a result of this project but because acrolein is regulated by a NSPS or NESHAP, modeling is not required.

Carcinogenic TAP Emissions

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

Table 6 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	3.98E-02	1.88E-01	1.48E-01	3.00E-03	Yes
Benzene	7.73E-03	4.35E-02	3.58E-02	8.00E-04	Yes
Benzo(e)pyrene	1.98E-06	9.33E-06	7.36E-06	2.00E-06	Yes
1,3-butadiene	3.16E-03	1.49E-02	1.17E-02	2.40E-05	Yes
Carbon Tetrachloride	1.75E-04	8.25E-04	6.50E-04	4.40E-04	Yes
Chloroform	1.36E-04	6.40E-04	5.05E-04	2.80E-04	Yes
1,1-dichloroethane	1.12E-04	5.30E-04	4.18E-04	2.50E-04	Yes
1,2-dichloroethane	1.12E-04	5.30E-04	4.18E-04	2.50E-04	Yes
1,3-dichloropropene	1.26E-04	5.93E-04	4.68E-04	1.90E-07	Yes
Ethylene Dibromide	2.11E-04	9.96E-04	7.85E-04	3.00E-05	Yes
Formaldehyde	2.52E-01	1.19	9.35E-01	5.10E-04	Yes
Methylene Chloride	1.96E-04	9.26E-04	7.30E-04	1.60E-03	No
PAH	6.71E-04	3.17E-03	2.50E-03	9.10E-05	Yes
1,1,2,2-Tetrachloroethane	1.90E-04	8.99E-04	7.08E-04	1.10E-05	Yes
1,1,2-Trichloroethane	1.51E-04	7.15E-04	5.63E-04	4.20E-04	Yes
Vinyl Chloride	7.09E-05	3.35E-04	2.64E-04	9.40E-04	No

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project but because these TAPs are regulated by a NSPS or NESHAP, modeling is not required.

Post Project HAP Emissions

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

Table 7 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

Hazardous Air Pollutants	PTE (lb/hr)	PTE (T/yr)
Acetaldehyde	0.19	0.83
Acrolein	0.12	0.51
Benzene	0.04	0.19
Ethylbenzene	0.002	0.01
Formaldehyde	1.19	5.20
Methanol	0.07	0.30
n-Hexane	0.26	1.12
Toluene	0.02	0.08
2,2,4-Trimethylpentane	0.005	0.02
Xylene	0.01	0.05
Totals	**1.90**	**8.31**

Ambient Air Quality Impact Analyses

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

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

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

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Payette 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 THAPs (Total Hazardous Air Pollutants) Only:

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

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

SM = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the potential HAP emissions are limited to < 8 T/yr of a single HAP and/or < 20 T/yr of THAP.

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

UNK = Class is unknown

For All Other Pollutants:

A = Actual or potential emissions of a pollutant are $\geq$ 100 T/yr.

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

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[1] Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013.

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

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

UNK = Class is unknown.

Table 8 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	2.20	2.20	**100**	B
$PM_{10}/PM_{2.5}$	2.20	2.20	**100**	B
SO_2	0.09	0.09	**100**	B
NO_X	34.27	34.27	**100**	B
CO	51.54	51.54	**100**	B
VOC	1402.1	41.0	**100**	SM
HAP (single)	48.35	5.20	**10**	SM
HAP (Total)	60.34	8.31	**25**	SM

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 emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 2.4 and 3.4.

Standards for New Sources (IDAPA 58.01.01.676)

IDAPA 58.01.01.676 ..... Standards for New Sources

The fuel burning equipment located at this facility, with a maximum rated input of ten (10) million BTU per hour or more, are subject to a particulate matter limitation of 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume when combusting gaseous fuels. Fuel-Burning Equipment is defined as any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. This requirement is assured by Permit Conditions 2.3 and 3.3.

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}, $PM_{2.5}$, SO_2, NO_X, CO, and VOC 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 not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

The facility remains subject to the requirements of 40 CFR 60 Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution. DEQ is delegated this Subpart. For a breakdown of the subpart, please refer to the Statement of Basis issued July 11, 2014.

Although no modifications proposed by this permitting action trigger any requirements in 40 CFR 60 Subpart OOOO(a), the facility will be required to comply with the Subpart should any changes in equipment become subject to the Subpart.

The facility has proposed to operate three additional compressor engines that may be subject to the requirements of 40 CFR 60 Subpart JJJJ depending on date of manufacture. The proposed compressor IC engines are 610 bhp, 1380 bhp, and 203 bhp natural gas-fired engines. Below is a breakdown of Subpart JJJJ. DEQ is delegated this Subpart.

40 CFR 60, Subpart JJJJ ..... Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

§60.4230 *Am I subject to this subpart?*

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (6) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(4) Owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured:

(i) On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP);

(iii) on or after July 1, 2008, for engines with a maximum engine power less than 500 HP; or

(6) The provisions of §60.4236 of this subpart are applicable to all owners and operators of stationary SI ICE that commence construction after June 12, 2006.

The applicable IC engines are stationary spark ignition engines that may be subject to the Subpart if they commence construction after June 12, 2006.

§60.4231 *What emission standards must I meet if I am a manufacturer of stationary SI internal combustion engines or equipment containing such engines?*

The facility is not an engine manufacturer and therefore these requirements do not apply.

§60.4232 *How long must my engines meet the emission standards if I am a manufacturer of stationary SI internal combustion engines?*

The facility is not an engine manufacturer and therefore these requirements do not apply.

§60.4233 *What emission standards must I meet if I am an owner or operator of a stationary SI internal combustion engine?*

(e) Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011 that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators may meet the CO certification (not field testing) standard for which the engine was certified.

Table 1 to Subpart JJJJ of Part 60—NO_X, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥100 HP (Except Gasoline and Rich Burn LPG), Stationary SI Landfill/Digester Gas Engines, and Stationary Emergency Engines >25 HP

Engine type and fuel	Maximum engine power	Manufacture date	Emission standards[a]					
			g/HP-hr			ppmvd at 15% O_2		
			NO_X	CO	VOC[d]	NO_X	CO	VOC[d]
Non-Emergency SI Natural Gas[b] and Non-Emergency SI Lean Burn LPG[b]	100≤HP<500	7/1/2008	2.0	4.0	1.0	160	540	86
Non-Emergency SI Natural Gas and Non-Emergency SI Lean Burn LPG (except lean burn 500≤HP<1,350)	HP≥500	7/1/2007	2.0	4.0	1.0	160	540	86
	HP≥500	7/1/2010	1.0	2.0	0.7	82	270	60

[a]Owners and operators of stationary non-certified SI engines may choose to comply with he emission standards in units of either g/HP-hr or ppmvd at 15 percent O_2.

[b]Owners and operators of new or reconstructed non-emergency lean bum SI stationary engines with a site rating of greater than or equal to 250 brake HP located at a major source that are meeting the requirements of 40 CFR part 63, subpart ZZZZ, Table 2a do not have to comply with the CO emission standards of Table 1 of this subpart.

[c]The emission standards applicable to emergency engines between 25 HP and 130 HP are in terms of NO_X + HC.

[d]For purposes of this subpart, when calculating emissions of volatile organic compounds, emissions of formaldehyde should not be included.

The applicable IC engines shall comply with the emission standards as shown above in Table 1 to the Subpart.

§60.4234 *How long must I meet the emission standards if I am an owner or operator of a stationary SI internal combustion engine?*

Owners and operators of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in §60.4233 over the entire life of the engine.

The applicable IC engines must meet the emission standards over the entire life of the engines.

§60.4236 *What is the deadline for importing or installing stationary SI ICE produced in previous model years?*

(a) After July 1, 2010, owners and operators may not install stationary SI ICE with a maximum engine power of less than 500 HP that do not meet the applicable requirements in §60.4233.

(b) After July 1, 2009, owners and operators may not install stationary SI ICE with a maximum engine power of greater than or equal to 500 HP that do not meet the applicable requirements in §60.4233, except that lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP that do not meet the applicable requirements in §60.4233 may not be installed after January 1, 2010.

The applicable IC engines will be installed after July 1, 2009 and the engines will meet the applicable requirements in §60.4233.

§60.4237 *What are the monitoring requirements if I am an owner or operator of an emergency stationary SI internal combustion engine?*

The applicable IC engines are not emergency engines and therefore these requirements do not apply.

§60.4238 *What are my compliance requirements if I am a manufacturer of stationary SI internal combustion engines ≤19 KW (25 HP) or a manufacturer of equipment containing such engines?*

The facility is not an engine manufacturer and therefore these requirements do not apply.

§60.4239 *What are my compliance requirements if I am a manufacturer of stationary SI internal combustion engines >19 KW (25 HP) that use gasoline or a manufacturer of equipment containing such engines?*

The facility is not an engine manufacturer and therefore these requirements do not apply.

§60.4240 *What are my compliance requirements if I am a manufacturer of stationary SI internal combustion engines >19 KW (25 HP) that are rich burn engines that use LPG or a manufacturer of equipment containing such engines?*

The facility is not an engine manufacturer and therefore these requirements do not apply.

§60.4241 *What are my compliance requirements if I am a manufacturer of stationary SI internal combustion engines participating in the voluntary certification program or a manufacturer of equipment containing such engines?*

The facility is not an engine manufacturer and therefore these requirements do not apply.

§60.4242 *What other requirements must I meet if I am a manufacturer of stationary SI internal combustion engines or equipment containing stationary SI internal combustion engines or a manufacturer of equipment containing such engines?*

The facility is not an engine manufacturer and therefore these requirements do not apply.

§60.4243 *What are my compliance requirements if I am an owner or operator of a stationary SI internal combustion engine?*

(b) If you are an owner or operator of a stationary SI internal combustion engine and must comply with the emission standards specified in §60.4233(d) or (e), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) and (2) of this section.

(1) Purchasing an engine certified according to procedures specified in this subpart, for the same model year and demonstrating compliance according to one of the methods specified in paragraph (a) of this section.

(2) Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in §60.4233(d) or (e) and according to the requirements specified in §60.4244, as applicable, and according to paragraphs (b)(2)(i) and (ii) of this section.

(i) If you are an owner or operator of a stationary SI internal combustion engine greater than 25 HP and less than or equal to 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance.

(ii) If you are an owner or operator of a stationary SI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance.

(e) Owners and operators of stationary SI natural gas fired engines may operate their engines using propane for a maximum of 100 hours per year as an alternative fuel solely during emergency operations, but must keep records of such use. If propane is used for more than 100 hours per year in an engine that is not certified to the emission standards when using propane, the owners and operators are required to conduct a performance test to demonstrate compliance with the emission standards of §60.4233.

(f) If you are an owner or operator of a stationary SI internal combustion engine that is less than or equal to 500 HP and you purchase a non-certified engine or you do not operate and maintain your certified stationary SI internal combustion engine and control device according to the manufacturer's written emission-related instructions, you are required to perform initial performance testing as indicated in this section, but you are not required to conduct subsequent performance testing unless the stationary engine is rebuilt or undergoes major repair or maintenance. A rebuilt stationary SI ICE means an engine that has been rebuilt as that term is defined in 40 CFR 94.11(a).

(g) It is expected that air-to-fuel ratio controllers will be used with the operation of three-way catalysts/non-selective catalytic reduction. The AFR controller must be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times.

The permittee shall keep a maintenance plan and records for minimizing emissions. Performance tests will be required according to the schedule stated above.

§60.4244 *What test methods and other procedures must I use if I am an owner or operator of a stationary SI internal combustion engine?*

Owners and operators of stationary SI ICE who conduct performance tests must follow the procedures in paragraphs (a) through (f) of this section.

(a) Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements in §60.8 and under the specific conditions that are specified by Table 2 to this subpart.

(b) You may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in §60.8(c). If your stationary SI internal combustion engine is non-operational, you do not need to startup the engine solely to conduct a performance test; however, you must conduct the performance test immediately upon startup of the engine.

(c) You must conduct three separate test runs for each performance test required in this section, as specified in §60.8(f). Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least 1 hour.

(d) To determine compliance with the NO_x mass per unit output emission limitation, convert the concentration of NO_x in the engine exhaust using Equation 1 of this section:

$$ER = \frac{C_d \times 1.912 \times 10^{-3} \times Q \times T}{HP - hr} \qquad \text{(Eq. 1)}$$

Where:

ER = Emission rate of NO_x in g/HP-hr.

C_d = Measured NO_x concentration in parts per million by volume (ppmv).

1.912×10^{-3} = Conversion constant for ppm NO_x to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, horsepower-hour (HP-hr).

(e) To determine compliance with the CO mass per unit output emission limitation, convert the concentration of CO in the engine exhaust using Equation 2 of this section:

$$ER = \frac{C_d \times 1.164 \times 10^{-3} \times Q \times T}{HP - hr} \quad \text{(Eq. 2)}$$

Where:

ER = Emission rate of CO in g/HP-hr.

C_d = Measured CO concentration in ppmv.

1.164×10^{-3} = Conversion constant for ppm CO to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, in HP-hr.

(f) For purposes of this subpart, when calculating emissions of VOC, emissions of formaldehyde should not be included. To determine compliance with the VOC mass per unit output emission limitation, convert the concentration of VOC in the engine exhaust using Equation 3 of this section:

$$ER = \frac{C_d \times 1.833 \times 10^{-3} \times Q \times T}{HP - hr} \quad \text{(Eq. 3)}$$

Where:

ER = Emission rate of VOC in g/HP-hr.

C_d = VOC concentration measured as propane in ppmv.

1.833×10^{-3} = Conversion constant for ppm VOC measured as propane, to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, in HP-hr.

(g) If the owner/operator chooses to measure VOC emissions using either Method 18 of 40 CFR part 60, appendix A, or Method 320 of 40 CFR part 63, appendix A, then it has the option of correcting the measured VOC emissions to account for the potential differences in measured values between these methods and Method 25A. The results from Method 18 and Method 320 can be corrected for response factor differences using Equations 4 and 5 of this section. The corrected VOC concentration can then be placed on a propane basis using Equation 6 of this section.

$$RF_i = \frac{C_{Mi}}{C_{Ai}} \quad \text{(Eq. 4)}$$

Where:

RF_i = Response factor of compound i when measured with EPA Method 25A.

C_{Mi} = Measured concentration of compound i in ppmv as carbon.

C_{Ai} = True concentration of compound i in ppmv as carbon.

$$C_{ieor} = RF_i \times C_{imeas} \quad \text{(Eq. 5)}$$

Where:

C_{icorr} = *Concentration of compound i corrected to the value that would have been measured by EPA Method 25A, ppmv as carbon.*

C_{imeas} = *Concentration of compound i measured by EPA Method 320, ppmv as carbon.*

$C_{Peq} = 0.6098 \times C_{icorr}$ (Eq. 6)

Where:

C_{Peq} = *Concentration of compound i in mg of propane equivalent per DSCM.*

The permittee shall conduct performance tests according to the procedures outlined above.

§60.4245 *What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary SI internal combustion engine?*

Owners or operators of stationary SI ICE must meet the following notification, reporting and recordkeeping requirements.

(a) Owners and operators of all stationary SI ICE must keep records of the information in paragraphs (a)(1) through (4) of this section.

(1) All notifications submitted to comply with this subpart and all documentation supporting any notification.

(2) Maintenance conducted on the engine.

(3) If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90, 1048, 1054, and 1060, as applicable.

(4) If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to §60.4243(a)(2), documentation that the engine meets the emission standards.

(c) Owners and operators of stationary SI ICE greater than or equal to 500 HP that have not been certified by an engine manufacturer to meet the emission standards in §60.4231 must submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (c)(1) through (5) of this section.

(1) Name and address of the owner or operator;

(2) The address of the affected source;

(3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

(4) Emission control equipment; and

(5) Fuel used.

(d) Owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in §60.4244 within 60 days after the test has been completed.

If the applicable IC engines are not certified by the manufacturer, the permittee shall comply with the requirements above.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

The facility has proposed to operate three additional compressor engines in addition to the 610 bhp compressor engine already permitted at the facility that may be subject to the requirements of 40 CFR 63 Subpart ZZZZ depending on date of manufacture. The proposed compressor IC engines are 610 bhp, 1380 bhp, and 203 bhp natural gas-fired engines. Below is a breakdown of Subpart ZZZZ. DEQ is delegated this Subpart.

40 CFR 63, Subpart ZZZZ.....National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

§63.6585 Am I subject to this subpart?

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

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

(b) A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.

(c) An area source of HAP emissions is a source that is not a major source.

The facility will operate four non-emergency engines. In addition, the facility is an area source for HAPs as they are below the major source threshold of 10 T/yr for any one federally regulated HAP and 25 T/yr for all HAPs combined.

§63.6590 What parts of my plant does this subpart cover?

This subpart applies to each affected source.

(a) Affected source. An affected source is any existing, new, or reconstructed stationary RICE located at a major or area source of HAP emissions, excluding stationary RICE being tested at a stationary RICE test cell/stand.

(1) Existing stationary RICE.

(i) For stationary RICE with a site rating of more than 500 brake horsepower (HP) located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before December 19, 2002.

(ii) For stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

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

(iv) A change in ownership of an existing stationary RICE does not make that stationary RICE a new or reconstructed stationary RICE.

(2) New stationary RICE. (i) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.

(ii) A stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

(iii) A stationary RICE located at an area source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

(c) Stationary RICE subject to Regulations under 40 CFR Part 60. An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

(1) A new or reconstructed stationary RICE located at an area source;

The IC engines to be located at the facility will be considered existing if they commenced construction of the engines before June 12, 2006. If the engine installed is considered new they will be subject to the regulations of 40 CFR Part 60 Subpart JJJJ.

§63.6595 *When do I have to comply with this subpart?*

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

(c) If you own or operate an affected source, you must meet the applicable notification requirements in §63.6645 and in 40 CFR part 63, subpart A.

The IC engines must be in compliance with the Subpart no later than October 19, 2013 or upon installation.

§63.6600 *What emission limitations and operating limitations must I meet if I own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions?*

The applicable IC engines are not operating at a major source for HAP emissions. Therefore there are no applicable emission and operating limitations under this section.

§63.6601 *What emission limitations must I meet if I own or operate a new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 brake HP and less than or equal to 500 brake HP located at a major source of HAP emissions?*

The applicable IC engines are not operating at a major source for HAP emissions and the engines are not 4-stroke lean burn spark ignition between 250 and 500 bhp. Therefore there are no applicable emission and operating limitations under this section.

§63.6602 *What emission limitations and other requirements must I meet if I own or operate an existing stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions?*

The applicable IC engines are not operating at a major source for HAP emissions. Therefore there are no applicable emission and operating limitations under this section.

§63.6603 *What emission limitations, operating limitations, and other requirements must I meet if I own or operate an existing stationary RICE located at an area source of HAP emissions?*

Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart.

(a) If you own or operate an existing stationary RICE located at an area source of HAP emissions, you must comply with the requirements in Table 2d to this subpart and the operating limitations in Table 2b to this subpart that apply to you.

Table 2b does not apply to the IC engines at the facility. The engines are not CI stationary RICE and are not located at a major source of HAP emissions. Table 2d identifies those limitations required by area sources to comply with the Subpart. The specifics of Table 2d require that the permittee install NSCR (non-selective catalytic reduction) on the engines greater than 500 hp to reduce HAP emissions from the stationary RICE. Engines less than 500 hp are required to change oil and filter every 1,440 hours of operation or annually, whichever comes first, inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; and inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.

§63.6604 *What fuel requirements must I meet if I own or operate a stationary CI RICE?*

The applicable IC engines are not stationary CI RICE. Therefore there are no applicable emission and operating limitations under this section.

§63.6605 *What are my general requirements for complying with this subpart?*

(a) You must be in compliance with the emission limitations, operating limitations, and other requirements in this subpart that apply to you at all times.

(b) At all times you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

When operating the IC engines, they must be operated in a manner that is consistent with reducing emissions and compliance with appropriate limitations applies at all times.

§63.6610 *By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions?*

The applicable IC engines are not operating at a major source for HAP emissions. Therefore there are no applicable emission and operating limitations under this section.

§63.6611 *By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate a new or reconstructed 4SLB SI stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at a major source of HAP emissions?*

The applicable IC engines are not operating at a major source for HAP emissions. Therefore there are no applicable emission and operating limitations under this section.

§63.6612 *By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate an existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing stationary RICE located at an area source of HAP emissions?*

If you own or operate an existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing stationary RICE located at an area source of HAP emissions you are subject to the requirements of this section.

(a) You must conduct any initial performance test or other initial compliance demonstration according to Tables 4 and 5 to this subpart that apply to you within 180 days after the compliance date that is specified for your stationary RICE in §63.6595 and according to the provisions in §63.7(a)(2).

(b) An owner or operator is not required to conduct an initial performance test on a unit for which a performance test has been previously conducted, but the test must meet all of the conditions described in paragraphs (b)(1) through (4) of this section.

(1) The test must have been conducted using the same methods specified in this subpart, and these methods must have been followed correctly.

(2) The test must not be older than 2 years.

(3) The test must be reviewed and accepted by the Administrator.

(4) Either no process or equipment changes must have been made since the test was performed, or the owner or operator must be able to demonstrate that the results of the performance test, with or without adjustments, reliably demonstrate compliance despite process or equipment changes.

Table 5 requires the applicable IC engines to comply with the requirement to install NSCR using an oxidation catalyst. Initial compliance has been demonstrated if the average reduction of emissions of CO is 75 percent or more, the average CO concentration is less than or equal to 270 ppmvd at 15 percent O_2, or the average reduction of emissions of THC is 30 percent or more. Initial compliance has also been demonstrated if a CPMS has been installed to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b), or if equipment has been installed to automatically shut down the engine if the catalyst inlet temperature exceeds 1250 °F.

§63.6615 When must I conduct subsequent performance tests?

If you must comply with the emission limitations and operating limitations, you must conduct subsequent performance tests as specified in Table 3 of this subpart.

The applicable IC engines are not subject to subsequent performance tests as specified in Table 3.

§63.6620 What performance tests and other procedures must I use?

(a) You must conduct each performance test in Tables 3 and 4 of this subpart that applies to you.

(b) Each performance test must be conducted according to the requirements that this subpart specifies in Table 4 to this subpart. If you own or operate a non-operational stationary RICE that is subject to performance testing, you do not need to start up the engine solely to conduct the performance test. Owners and operators of a non-operational engine can conduct the performance test when the engine is started up again. The test must be conducted at any load condition within plus or minus 10 percent of 100 percent load for the stationary RICE listed in paragraphs (b)(1) through (4) of this section.

(1) Non-emergency 4SRB stationary RICE with a site rating of greater than 500 brake HP located at a major source of HAP emissions.

(2) New non-emergency 4SLB stationary RICE with a site rating of greater than or equal to 250 brake HP located at a major source of HAP emissions.

(3) New non-emergency 2SLB stationary RICE with a site rating of greater than 500 brake HP located at a major source of HAP emissions.

(4) New non-emergency CI stationary RICE with a site rating of greater than 500 brake HP located at a major source of HAP emissions.

(c) [Reserved]

(d) You must conduct three separate test runs for each performance test required in this section, as specified in §63.7(e)(3). Each test run must last at least 1 hour, unless otherwise specified in this subpart.

(e)(1) You must use Equation 1 of this section to determine compliance with the percent reduction requirement:

$$\frac{C_i - C_o}{C_i} \times 100 = R \quad \text{(Eq. 1)}$$

Where:

C_i = *concentration of carbon monoxide (CO), total hydrocarbons (THC), or formaldehyde at the control device inlet,*

C_o = *concentration of CO, THC, or formaldehyde at the control device outlet, and*

R = percent reduction of CO, THC, or formaldehyde emissions.

(2) You must normalize the CO, THC, or formaldehyde concentrations at the inlet and outlet of the control device to a dry basis and to 15 percent oxygen, or an equivalent percent carbon dioxide (CO_2). If pollutant concentrations are to be corrected to 15 percent oxygen and CO_2 concentration is measured in lieu of oxygen concentration measurement, a CO_2 correction factor is needed. Calculate the CO_2 correction factor as described in paragraphs (e)(2)(i) through (iii) of this section.

(i) Calculate the fuel-specific F_o value for the fuel burned during the test using values obtained from Method 19, Section 5.2, and the following equation:

$$F_o = \frac{0.209\ F_d}{F_c} \quad \text{(Eq. 2)}$$

Where:

F_o = Fuel factor based on the ratio of oxygen volume to the ultimate CO_2 volume produced by the fuel at zero percent excess air.

0.209 = Fraction of air that is oxygen, percent/100.

F_d = Ratio of the volume of dry effluent gas to the gross calorific value of the fuel from Method 19, dsm^3/J ($dscf/10^6$ Btu).

F_c = Ratio of the volume of CO_2 produced to the gross calorific value of the fuel from Method 19, dsm^3/J ($dscf/10^6$ Btu)

(ii) Calculate the CO_2 correction factor for correcting measurement data to 15 percent O_2, as follows:

$$X_{CO2} = \frac{5.9}{F_o} \quad \text{(Eq. 3)}$$

Where:

X_{co2} = CO_2 correction factor, percent.

5.9 = 20.9 percent O_2—15 percent O_2, the defined O_2 correction value, percent.

(iii) Calculate the CO, THC, and formaldehyde gas concentrations adjusted to 15 percent O_2 using CO_2 as follows:

$$C_{adj} = C_d \frac{X_{CO2}}{\%CO_2} \quad \text{(Eq. 4)}$$

Where:

C_{adj} = Calculated concentration of CO, THC, or formaldehyde adjusted to 15 percent O_2.

C_d = Measured concentration of CO, THC, or formaldehyde, uncorrected.

X_{co2} = CO_2 correction factor, percent.

$\%CO_2$ = Measured CO_2 concentration measured, dry basis, percent.

(f) If you comply with the emission limitation to reduce CO and you are not using an oxidation catalyst, if you comply with the emission limitation to reduce formaldehyde and you are not using NSCR, or if you comply with the emission limitation to limit the concentration of formaldehyde in the stationary RICE exhaust and you are not using an oxidation catalyst or NSCR, you must petition the Administrator for operating limitations to be established during the initial performance test and continuously monitored thereafter; or for approval of no operating limitations. You must not conduct the initial performance test until after the petition has been approved by the Administrator.

(g) If you petition the Administrator for approval of operating limitations, your petition must include the information described in paragraphs (g)(1) through (5) of this section.

(1) Identification of the specific parameters you propose to use as operating limitations;

(2) A discussion of the relationship between these parameters and HAP emissions, identifying how HAP emissions change with changes in these parameters, and how limitations on these parameters will serve to limit HAP emissions;

(3) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;

(4) A discussion identifying the methods you will use to measure and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and

(5) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

(h) If you petition the Administrator for approval of no operating limitations, your petition must include the information described in paragraphs (h)(1) through (7) of this section.

(1) Identification of the parameters associated with operation of the stationary RICE and any emission control device which could change intentionally (e.g., operator adjustment, automatic controller adjustment, etc.) or unintentionally (e.g., wear and tear, error, etc.) on a routine basis or over time;

(2) A discussion of the relationship, if any, between changes in the parameters and changes in HAP emissions;

(3) For the parameters which could change in such a way as to increase HAP emissions, a discussion of whether establishing limitations on the parameters would serve to limit HAP emissions;

(4) For the parameters which could change in such a way as to increase HAP emissions, a discussion of how you could establish upper and/or lower values for the parameters which would establish limits on the parameters in operating limitations;

(5) For the parameters, a discussion identifying the methods you could use to measure them and the instruments you could use to monitor them, as well as the relative accuracy and precision of the methods and instruments;

(6) For the parameters, a discussion identifying the frequency and methods for recalibrating the instruments you could use to monitor them; and

(7) A discussion of why, from your point of view, it is infeasible or unreasonable to adopt the parameters as operating limitations.

(i) The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate the percent load in a specific application. A written report of the average percent load determination must be included in the notification of compliance status. The following information must be included in the written report: the engine model number, the engine manufacturer, the year of purchase, the manufacturer's site-rated brake horsepower, the ambient temperature, pressure, and humidity during the performance test, and all assumptions that were made to estimate or calculate percent load during the performance test must be clearly explained. If measurement devices such as flow meters, kilowatt meters, beta analyzers, stain gauges, etc. are used, the model number of the measurement device, and an estimate of its accurate in percentage of true value must be provided.

The applicable IC engines are not subject to the subsequent performance tests criteria listed above.

§63.6625 *What are my monitoring, installation, collection, operation, and maintenance requirements?*

(a) If you elect to install a CEMS as specified in Table 5 of this subpart, you must install, operate, and maintain a CEMS to monitor CO and either O_2 or CO_2 according to the requirements in paragraphs (a)(1) through (4) of this section. If you are meeting a requirement to reduce CO emissions, the CEMS must be installed at both the inlet and outlet of the control device. If you are meeting a requirement to limit the concentration of CO, the CEMS must be installed at the outlet of the control device.

A CEMS is not required and will not be installed on the applicable IC engines. Therefore this requirement is not applicable.

(b) If you are required to install a continuous parameter monitoring system (CPMS) as specified in Table 5 of this subpart, you must install, operate, and maintain each CPMS according to the requirements in paragraphs (b)(1) through (6) of this section. For an affected source that is complying with the emission limitations and operating limitations on March 9, 2011, the requirements in paragraph (b) of this section are applicable September 6, 2011.

A CPMS is not required and will not be installed on the applicable IC engines. Therefore this requirement is not applicable.

(c) If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must monitor and record your fuel usage daily with separate fuel meters to measure the volumetric flow rate of each fuel. In addition, you must operate your stationary RICE in a manner which reasonably minimizes HAP emissions.

The applicable IC engines will not use landfill or digester gas as fuel. Therefore there are no applicable requirements under this section.

(d) If you are operating a new or reconstructed emergency 4SLB stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at a major source of HAP emissions, you must install a non-resettable hour meter prior to the startup of the engine.

The applicable IC engines are not operating at a major source for HAP emissions. Therefore there are no applicable requirements under this section.

(e) If you own or operate any of the following stationary RICE, you must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions:

(1) An existing stationary RICE with a site rating of less than 100 HP located at a major source of HAP emissions;

(2) An existing emergency or black start stationary RICE with a site rating of less than or equal to 500 HP located at a major source of HAP emissions;

(3) An existing emergency or black start stationary RICE located at an area source of HAP emissions;

(4) An existing non-emergency, non-black start stationary CI RICE with a site rating less than or equal to 300 HP located at an area source of HAP emissions;

(5) An existing non-emergency, non-black start 2SLB stationary RICE located at an area source of HAP emissions;

(6) An existing non-emergency, non-black start stationary RICE located at an area source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis.

(7) An existing non-emergency, non-black start 4SLB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;

(8) An existing non-emergency, non-black start 4SRB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;

(9) An existing, non-emergency, non-black start 4SLB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year; and

(10) An existing, non-emergency, non-black start 4SRB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year.

The applicable IC engine will be required to operate and be maintained according to the manufacturer's instructions or the facility can develop their own maintenance plan.

(f) If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing emergency stationary RICE located at an area source of HAP emissions, you must install a non-resettable hour meter if one is not already installed.

The applicable IC engines are not emergency stationary RICE. Therefore there are no applicable requirements under this section.

(g) If you own or operate an existing non-emergency, non-black start CI engine greater than or equal to 300 HP that is not equipped with a closed crankcase ventilation system, you must comply with either paragraph (g)(1) or paragraph (2) of this section. Owners and operators must follow the manufacturer's specified maintenance requirements for operating and maintaining the open or closed crankcase ventilation systems and replacing the crankcase filters, or can request the Administrator to approve different maintenance requirements that are as protective as manufacturer requirements. Existing CI engines located at area sources in areas of Alaska that meet either §63.6603(b)(1) or §63.6603(b)(2) do not have to meet the requirements of this paragraph (g). Existing CI engines located on offshore vessels that meet §63.6603(c) do not have to meet the requirements of this paragraph (g).

The applicable IC engines are not CI engines. Therefore there are no applicable requirements under this section.

(h) If you operate a new, reconstructed, or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Tables 1a, 2a, 2c, and 2d to this subpart apply.

Idle startup time may not exceed 30 minutes for the applicable IC engines.

(i) If you own or operate a stationary CI engine that is subject to the work, operation or management practices in items 1 or 2 of Table 2c to this subpart or in items 1 or 4 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 business days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 business days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

The applicable IC engines are not CI engines. Therefore there are no applicable requirements under this section.

(j) If you own or operate a stationary SI engine that is subject to the work, operation or management practices in items 6, 7, or 8 of Table 2c to this subpart or in items 5, 6, 7, 9, or 11 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Acid Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Acid Number increases by more than 3.0 milligrams of potassium hydroxide (KOH) per gram from Total Acid Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 business days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 business days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of

the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

The IC engine less than 500 hp has the option of utilizing an oil analysis program.

§63.6630 *How do I demonstrate initial compliance with the emission limitations, operating limitations, and other requirements?*

(a) You must demonstrate initial compliance with each emission limitation, operating limitation, and other requirement that applies to you according to Table 5 of this subpart.

(b) During the initial performance test, you must establish each operating limitation in Tables 1b and 2b of this subpart that applies to you.

(c) You must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in §63.6645.

(d) Non-emergency 4SRB stationary RICE complying with the requirement to reduce formaldehyde emissions by 76 percent or more can demonstrate initial compliance with the formaldehyde emission limit by testing for THC instead of formaldehyde. The testing must be conducted according to the requirements in Table 4 of this subpart. The average reduction of emissions of THC determined from the performance test must be equal to or greater than 30 percent.

(e) The initial compliance demonstration required for existing non-emergency 4SLB and 4SRB stationary RICE with a site rating of more than 500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year must be conducted according to the following requirements:

(1) The compliance demonstration must consist of at least three test runs.

(2) Each test run must be of at least 15 minute duration, except that each test conducted using the method in appendix A to this subpart must consist of at least one measurement cycle and include at least 2 minutes of test data phase measurement.

(3) If you are demonstrating compliance with the CO concentration or CO percent reduction requirement, you must measure CO emissions using one of the CO measurement methods specified in Table 4 of this subpart, or using appendix A to this subpart.

(4) If you are demonstrating compliance with the THC percent reduction requirement, you must measure THC emissions using Method 25A, reported as propane, of 40 CFR part 60, appendix A.

(5) You must measure O_2 using one of the O_2 measurement methods specified in Table 4 of this subpart. Measurements to determine O_2 concentration must be made at the same time as the measurements for CO or THC concentration.

(6) If you are demonstrating compliance with the CO or THC percent reduction requirement, you must measure CO or THC emissions and O_2 emissions simultaneously at the inlet and outlet of the control device.

The permittee is subject to the requirements of 40 CFR 63.6630(e) as outlined above.

§63.6635 *How do I monitor and collect data to demonstrate continuous compliance?*

(a) If you must comply with emission and operating limitations, you must monitor and collect data according to this section.

(b) Except for monitor malfunctions, associated repairs, required performance evaluations, and required quality assurance or control activities, you must monitor continuously at all times that the stationary RICE is operating. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

(c) You may not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels. You must, however, use all the valid data collected during all other periods.

The permittee must monitor and collect data continuously for the applicable IC engines except in instances included in §63.6635 (b).

§63.6640 *How do I demonstrate continuous compliance with the emission limitations, operating limitations, and other requirements?*

(a) You must demonstrate continuous compliance with each emission limitation, operating limitation, and other requirements in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you according to methods specified in Table 6 to this subpart.

(b) You must report each instance in which you did not meet each emission limitation or operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you. These instances are deviations from the emission and operating limitations in this subpart. These deviations must be reported according to the requirements in §63.6650. If you change your catalyst, you must reestablish the values of the operating parameters measured during the initial performance test. When you reestablish the values of your operating parameters, you must also conduct a performance test to demonstrate that you are meeting the required emission limitation applicable to your stationary RICE.

(c) The annual compliance demonstration required for existing non-emergency 4SLB and 4SRB stationary RICE with a site rating of more than 500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year must be conducted according to the following requirements:

(1) The compliance demonstration must consist of at least one test run.

(2) Each test run must be of at least 15 minute duration, except that each test conducted using the method in appendix A to this subpart must consist of at least one measurement cycle and include at least 2 minutes of test data phase measurement.

(3) If you are demonstrating compliance with the CO concentration or CO percent reduction requirement, you must measure CO emissions using one of the CO measurement methods specified in Table 4 of this subpart, or using appendix A to this subpart.

(4) If you are demonstrating compliance with the THC percent reduction requirement, you must measure THC emissions using Method 25A, reported as propane, of 40 CFR part 60, appendix A.

(5) You must measure O_2 using one of the O_2 measurement methods specified in Table 4 of this subpart. Measurements to determine O_2 concentration must be made at the same time as the measurements for CO or THC concentration.

(6) If you are demonstrating compliance with the CO or THC percent reduction requirement, you must measure CO or THC emissions and O_2 emissions simultaneously at the inlet and outlet of the control device.

(7) If the results of the annual compliance demonstration show that the emissions exceed the levels specified in Table 6 of this subpart, the stationary RICE must be shut down as soon as safely possible, and appropriate corrective action must be taken (e.g., repairs, catalyst cleaning, catalyst replacement). The stationary RICE must be retested within 7 days of being restarted and the emissions must meet the levels specified in Table 6 of this subpart. If the retest shows that the emissions continue to exceed the specified levels, the stationary RICE must again be shut down as soon as safely possible, and the stationary RICE may not operate, except for purposes of startup and testing, until the owner/operator demonstrates through testing that the emissions do not exceed the levels specified in Table 6 of this subpart.

(e) You must also report each instance in which you did not meet the requirements in Table 8 to this subpart that apply to you. If you own or operate a new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions (except new or reconstructed 4SLB engines greater than or equal to 250 and less than or equal to 500 brake HP), a new or reconstructed stationary RICE

located at an area source of HAP emissions, or any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in Table 8 to this subpart: An existing 2SLB stationary RICE, an existing 4SLB stationary RICE, an existing emergency stationary RICE, an existing limited use stationary RICE, or an existing stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis. If you own or operate any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in Table 8 to this subpart, except for the initial notification requirements: a new or reconstructed stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, a new or reconstructed emergency stationary RICE, or a new or reconstructed limited use stationary RICE.

The applicable IC engines will demonstrate compliance through the annual compliance test according to §63.6640(c) above.

§63.6645 What notifications must I submit and when?

(a) You must submit all of the notifications in §§63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), 63.9(b) through (e), and (g) and (h) that apply to you by the dates specified if you own or operate any of the following;

(2) An existing stationary RICE located at an area source of HAP emissions.

(g) If you are required to conduct a performance test, you must submit a Notification of Intent to conduct a performance test at least 60 days before the performance test is scheduled to begin as required in §63.7(b)(1).

(h) If you are required to conduct a performance test or other initial compliance demonstration as specified in Tables 4 and 5 to this subpart, you must submit a Notification of Compliance Status according to §63.9(h)(2)(ii).

(1) For each initial compliance demonstration required in Table 5 to this subpart that does not include a performance test, you must submit the Notification of Compliance Status before the close of business on the 30th day following the completion of the initial compliance demonstration.

(2) For each initial compliance demonstration required in Table 5 to this subpart that includes a performance test conducted according to the requirements in Table 3 to this subpart, you must submit the Notification of Compliance Status, including the performance test results, before the close of business on the 60th day following the completion of the performance test according to §63.10(d)(2).

The facility must comply with the notification requirements in §§63.7(b) and (c) and compliance demonstrations.

§63.6650 What reports must I submit and when?

(a) You must submit each report in Table 7 of this subpart that applies to you.

(b) Unless the Administrator has approved a different schedule for submission of reports under §63.10(a), you must submit each report by the date in Table 7 of this subpart and according to the requirements in paragraphs (b)(1) through (b)(9) of this section.

(1) For semiannual Compliance reports, the first Compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.6595 and ending on June 30 or December 31, whichever date is the first date following the end of the first calendar half after the compliance date that is specified for your source in §63.6595.

(2) For semiannual Compliance reports, the first Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date follows the end of the first calendar half after the compliance date that is specified for your affected source in §63.6595.

(3) For semiannual Compliance reports, each subsequent Compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31.

(4) For semiannual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date is the first date following the end of the semiannual reporting period.

(5) For each stationary RICE that is subject to permitting regulations pursuant to 40 CFR part 70 or 71, and if the permitting authority has established dates for submitting semiannual reports pursuant to 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6 (a)(3)(iii)(A), you may submit the first and subsequent Compliance reports according to the dates the permitting authority has established instead of according to the dates in paragraphs (b)(1) through (b)(4) of this section.

(6) For annual Compliance reports, the first Compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.6595 and ending on December 31.

(7) For annual Compliance reports, the first Compliance report must be postmarked or delivered no later than January 31 following the end of the first calendar year after the compliance date that is specified for your affected source in §63.6595.

(8) For annual Compliance reports, each subsequent Compliance report must cover the annual reporting period from January 1 through December 31.

(9) For annual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than January 31.

(c) The Compliance report must contain the information in paragraphs (c)(1) through (6) of this section.

(1) Company name and address.

(2) Statement by a responsible official, with that official's name, title, and signature, certifying the accuracy of the content of the report.

(3) Date of report and beginning and ending dates of the reporting period.

(4) If you had a malfunction during the reporting period, the compliance report must include the number, duration, and a brief description for each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded. The report must also include a description of actions taken by an owner or operator during a malfunction of an affected source to minimize emissions in accordance with §63.6605(b), including actions taken to correct a malfunction.

(5) If there are no deviations from any emission or operating limitations that apply to you, a statement that there were no deviations from the emission or operating limitations during the reporting period.

(6) If there were no periods during which the continuous monitoring system (CMS), including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), a statement that there were no periods during which the CMS was out-of-control during the reporting period.

(d) For each deviation from an emission or operating limitation that occurs for a stationary RICE where you are not using a CMS to comply with the emission or operating limitations in this subpart, the Compliance report must contain the information in paragraphs (c)(1) through (4) of this section and the information in paragraphs (d)(1) and (2) of this section.

(1) The total operating time of the stationary RICE at which the deviation occurred during the reporting period.

(2) Information on the number, duration, and cause of deviations (including unknown cause, if applicable), as applicable, and the corrective action taken.

(e) For each deviation from an emission or operating limitation occurring for a stationary RICE where you are using a CMS to comply with the emission and operating limitations in this subpart, you must include information in paragraphs (c)(1) through (4) and (e)(1) through (12) of this section.

(1) The date and time that each malfunction started and stopped.

(2) The date, time, and duration that each CMS was inoperative, except for zero (low-level) and high-level checks.

(3) The date, time, and duration that each CMS was out-of-control, including the information in §63.8(c)(8).

(4) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of malfunction or during another period.

(5) A summary of the total duration of the deviation during the reporting period, and the total duration as a percent of the total source operating time during that reporting period.

(6) A breakdown of the total duration of the deviations during the reporting period into those that are due to control equipment problems, process problems, other known causes, and other unknown causes.

(7) A summary of the total duration of CMS downtime during the reporting period, and the total duration of CMS downtime as a percent of the total operating time of the stationary RICE at which the CMS downtime occurred during that reporting period.

(8) An identification of each parameter and pollutant (CO or formaldehyde) that was monitored at the stationary RICE.

(9) A brief description of the stationary RICE.

(10) A brief description of the CMS.

(11) The date of the latest CMS certification or audit.

(12) A description of any changes in CMS, processes, or controls since the last reporting period.

The reports that must be maintained in accordance with the Subpart are stated in this section. The permittee is required to submit semi-annual Compliance reports (see Table 7 of the subpart for further details).

§63.6655 What records must I keep?

(a) If you must comply with the emission and operating limitations, you must keep the records described in paragraphs (a)(1) through (a)(5), (b)(1) through (b)(3) and (c) of this section.

(1) A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status that you submitted, according to the requirement in §63.10(b)(2)(xiv).

(2) Records of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment.

(3) Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii).

(4) Records of all required maintenance performed on the air pollution control and monitoring equipment.

(5) Records of actions taken during periods of malfunction to minimize emissions in accordance with §63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

(d) You must keep the records required in Table 6 of this subpart to show continuous compliance with each emission or operating limitation that applies to you.

(e) You must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan if you own or operate any of the following stationary RICE;

(1) An existing stationary RICE with a site rating of less than 100 brake HP located at a major source of HAP emissions.

(2) An existing stationary emergency RICE.

(3) An existing stationary RICE located at an area source of HAP emissions subject to management practices as shown in Table 2d to this subpart.

The permittee is required to maintain records of all required notifications, each malfunction, all performance tests and results, any required maintenance, and any corrective action that was taken.

§63.6660 In what form and how long must I keep my records?

(a) Your records must be in a form suitable and readily available for expeditious review according to §63.10(b)(1).

(b) As specified in §63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

(c) You must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1).

All records must be kept by the permittee for a minimum of five (5) years for each record.

Permit Conditions Review

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

Tables 1.1 and 2.2 were revised to include the three additional compressor engines and two heaters and to change the flare from emergency use to process use.

Permit Condition 2.7 was revised to remove the word emergency when describing the flares.

Permit Condition 2.152 was revised to remove 40 CFR 63, Subpart ZZZZ.

Permit Condition 3.1 was revised to include the three additional compressor engines in the process description.

Table 3.2 was revised to include the three additional compressor engines.

Permit Condition 3.4 was revised to include the three additional compressor engines.

Permit Condition 3.5 was revised to include the three additional compressor engines.

Permit Condition 3.8 was revised to include the maintenance requirements for Compressor Engines 2, 3, and 4.

Permit Condition 3.9 was revised to include the three additional compressor engines.

Permit Condition 3.11 was added to include the maintenance plan requirements for Compressor Engine 4.

Permit Condition 3.12 was revised to include the three additional compressor engines.

Permit Condition 3.13 was added to include the optional oil analysis program for Compressor Engine 4.

Permit Condition 3.15 was revised to include Compressor Engines 2 and 3.

Permit Condition 3.16 was revised to include Compressor Engines 2 and 3.

Permit Condition 3.19 was revised to include Compressor Engines 2 and 3.

Permit Condition 3.20 was revised to include Compressor Engines 2 and 3.

Permit Condition 3.21 was revised to include Compressor Engines 2 and 3.

Permit Condition 3.25 was revised to include Compressor Engines 2 and 3.

Permit Condition 3.26 was revised to include Compressor Engines 2 and 3.

Permit Conditions 3.31 through 3.48 were added to include the applicable requirements of 40 CFR 60, Subpart JJJJ.

Permit Condition 3.49 was added to incorporate by reference 40 CFR 60, Subpart JJJJ and 40 CFR 63, Subpart ZZZZ.

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 a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

Public Comment Period

A public comment period will be made available to the public in accordance with IDAPA 58.01.01.209.01.c.

APPENDIX A – EMISSIONS INVENTORIES

Northwest Gas Processing, LLC

Hwy 30 Treating Facility - Emission Summary

Version: 11/30/2015

Source Description	Engine 1		Engine 2		Engine 3		Engine 4		Heaters		Flare 1		Flare 2		Summary of Emissions	
Source Information	610 hp Engine		610 hp Engine		1380 hp Engine		203 hp Engine		Process Style Heaters		High Pressure Flare Emissions		Low Pressure Flare Emissions			
EPNs	ENG1		ENG2		ENG3		ENG4		See Heater Page		FLR1		FLR2			
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
VOC_{total}	0.6718	2.9425	0.6718	2.9425	1.5198	6.6568	0.1565	0.6855	0.0353	0.1547	1.1546	5.0570	5.1479	22.5479	**9.3577**	**40.9869**
NOx	1.3436	5.8850	1.3436	5.8850	3.0396	13.3137	0.4471	1.9585	0.6423	2.8132	0.4044	1.7714	0.6048	2.6489	**7.8255**	**34.2756**
CO	1.3436	5.8850	1.3436	5.8850	3.0396	13.3137	0.8943	3.9169	0.5395	2.3631	1.8437	8.0755	2.7571	12.0759	**11.7614**	**51.5151**
PM10	0.0924	0.4047	0.0924	0.4047	0.2203	0.9651	0.0310	0.1359	0.0488	0.2138	0.0100	0.0437	0.0100	0.0437	**0.5049**	**2.2116**
PM2.5	0.0924	0.4047	0.0924	0.4047	0.2203	0.9651	0.0310	0.1359	0.0366	0.1604	0.0100	0.0437	0.0100	0.0437	**0.4927**	**2.1582**
SO_2	0.0028	0.0123	0.0028	0.0123	0.0067	0.0292	0.0009	0.0041	0.0039	0.0169	0.0032	0.0138	0.0032	0.0138	**0.0234**	**0.1023**

Northwest Gas Processing, LLC

Hwy 30 Treating Facility - Emission Summary

Version: 11/30/2015

Source Description	Engine 1		Engine 2		Engine 3		Engine 4		Heaters		Flare 1		Flare 2		Summary of Emissions	
Source Information	610 hp Engine		610 hp Engine		1380 hp Engine		203 hp Engine		Process Style Heaters		High Pressure Flare Emissions		Low Pressure Flare Emissions			
EPNs	ENG1		ENG2		ENG3		ENG4		See Heater Page		FLR1		FLR2			
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
VOC_{total}	0.6718	2.9425	0.6718	2.9425	1.5198	6.6568	0.1565	0.6855	0.0353	0.1547	1.1546	5.0570	5.1479	22.5479	**9.3577**	**40.9869**
NOx	1.3436	5.8850	1.3436	5.8850	3.0396	13.3137	0.4471	1.9585	0.6423	2.8132	0.4044	1.7714	0.6048	2.6489	**7.8255**	**34.2756**
CO	1.3436	5.8850	1.3436	5.8850	3.0396	13.3137	0.8943	3.9169	0.5395	2.3631	1.8437	8.0755	2.7571	12.0759	**11.7614**	**51.5151**
PM10	0.0924	0.4047	0.0924	0.4047	0.2203	0.9651	0.0310	0.1359	0.0488	0.2138	0.0100	0.0437	0.0100	0.0437	**0.5049**	**2.2116**
PM2.5	0.0924	0.4047	0.0924	0.4047	0.2203	0.9651	0.0310	0.1359	0.0366	0.1604	0.0100	0.0437	0.0100	0.0437	**0.4927**	**2.1582**
SO_2	0.0028	0.0123	0.0028	0.0123	0.0067	0.0292	0.0009	0.0041	0.0039	0.0169	0.0032	0.0138	0.0032	0.0138	**0.0234**	**0.1023**

Source Description	Engine 1		Engine 2		Engine 3		Engine 4		Heaters		Flare 1		Flare 2			
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
n-Hexane	0.0053	0.0231	0.0053	0.0231	0.0126	0.0552	0.0018	0.0078	0.0116	0.0506	0.0372	0.1630	0.1828	0.8008	**0.2566**	**1.1237**
224-Trimethylpentane	0.0012	0.0052	0.0012	0.0052	0.0028	0.0124	0.0004	0.0018							**0.0056**	**0.0246**
Toluene	0.0027	0.0116	0.0027	0.0116	0.0063	0.0277	0.0009	0.0039	2.18E-05	9.56E-05	0.0025	0.0108	0.0036	0.0159	**0.0187**	**0.0817**
Ethylbenzene	0.0002	0.0008	0.0002	0.0008	0.0005	0.0020	0.0001	0.0003			0.0016	0.0069	0.0009	0.0037	**0.0033**	**0.0146**
Xylene	0.0009	0.0041	0.0009	0.0041	0.0022	0.0097	0.0003	0.0014			0.0032	0.0139	0.0027	0.0118	**0.0103**	**0.0449**
Acrolein	0.0245	0.1072	0.0245	0.1072	0.0583	0.2556	0.0082	0.0360							**0.1155**	**0.5059**
1,2-dichloropropane	0.0001	0.0006	0.0001	0.0006	0.0003	0.0013	0.0000	0.0002							**0.0006**	**0.0026**
Biphenyl	0.0010	0.0044	0.0010	0.0044	0.0024	0.0105	0.0003	0.0015							**0.0048**	**0.0209**
Chlorobenzene	0.0001	0.0006	0.0001	0.0006	0.0003	0.0015	0.0000	0.0002							**0.0007**	**0.0030**
Chloroethane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000							**0.0000**	**0.0002**
Cyclopentane	0.0011	0.0047	0.0011	0.0047	0.0026	0.0113	0.0004	0.0016							**0.0051**	**0.0223**
Methanol	0.0146	0.0638	0.0146	0.0638	0.0347	0.1521	0.0049	0.0214							**0.0688**	**0.3012**
Methylcyclohexane	0.0059	0.0256	0.0059	0.0256	0.0140	0.0612	0.0020	0.0086			0.0078	0.0342			**0.0354**	**0.1552**
n-Nonane	0.0005	0.0023	0.0005	0.0023	0.0012	0.0055	0.0002	0.0008			0.0015	0.0065	0.0197	0.0864	**0.0237**	**0.1037**
n-Octane	0.0017	0.0073	0.0017	0.0073	0.0040	0.0175	0.0006	0.0025			0.0111	0.0487	0.0762	0.3339	**0.0953**	**0.4172**
n-pentane	0.0124	0.0542	0.0124	0.0542	0.0295	0.1293	0.0042	0.0182	0.0167	0.07314	0.0824	0.3608	0.4107	1.7990	**0.5682**	**2.4889**
Naphthalene	0.0005	0.0020	0.0005	0.0020	0.0011	0.0048	0.0002	0.0007	3.9E-06	1.7E-05					**0.0022**	**0.0096**
Phenol	0.0001	0.0005	0.0001	0.0005	0.0003	0.0012	0.0000	0.0002							**0.0005**	**0.0024**
Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0310	0.1359	0.2946	1.2905	**0.3257**	**1.4264**
cyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0112	0.0491			**0.0112**	**0.0491**

Source Description	Engine 1		Engine 2		Engine 3		Engine 4		Heaters		Flare 1		Flare 2			
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY			lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Formaldehyde	0.2514	1.1009	0.2514	1.1009	0.5994	2.6253	0.0844	0.3698	4.82E-04	2.11E-03					**1.1870**	**5.1990**
Benzene	0.0075	0.0329	0.0075	0.0329	0.0179	0.0786	0.0025	0.0111	1.35E-05	5.91E-05	0.0047	0.0205	0.0033	0.0145	**0.0435**	**0.1906**
acetaldehyde	0.0398	0.1743	0.0398	0.1743	0.0949	0.4157	0.0134	0.0586							**0.1879**	**0.8228**
1,1-dichloroethane	0.0001	0.0005	0.0001	0.0005	0.0003	0.0012	0.0000	0.0002							**0.0005**	**0.0023**
1,2-dichloroethane	0.0001	0.0005	0.0001	0.0005	0.0003	0.0012	0.0000	0.0002							**0.0005**	**0.0023**
1,1,2-Trichloroethane	0.0002	0.0007	0.0002	0.0007	0.0004	0.0016	0.0001	0.0002							**0.0007**	**0.0031**
1,1,2,2-Tetrachloroethane	0.0002	0.0008	0.0002	0.0008	0.0005	0.0020	0.0001	0.0003							**0.0009**	**0.0039**
1,3-butadiene	0.0032	0.0138	0.0032	0.0138	0.0075	0.0330	0.0011	0.0046							**0.0149**	**0.0653**
1,3-dichloropropene	0.0001	0.0006	0.0001	0.0006	0.0003	0.0013	0.0000	0.0002							**0.0006**	**0.0026**
Benzo(a)pyrene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	7.7E-09	3.4E-08					**0.0000**	**0.0000**
Carbon Tetrachloride	0.0002	0.0008	0.0002	0.0008	0.0004	0.0018	0.0001	0.0003							**0.0008**	**0.0036**
Chloroform	0.0001	0.0006	0.0001	0.0006	0.0003	0.0014	0.0000	0.0002							**0.0006**	**0.0028**
Ethylene Dibromide	0.0002	0.0009	0.0002	0.0009	0.0005	0.0022	0.0001	0.0003							**0.0010**	**0.0044**
Methylene Chloride	0.0002	0.0009	0.0002	0.0009	0.0005	0.0020	0.0001	0.0003							**0.0009**	**0.0041**
PAH	0.0007	0.0029	0.0007	0.0029	0.0016	0.0070	0.0002	0.0010							**0.0032**	**0.0139**
Vinyl Chloride	0.0001	0.0003	0.0001	0.0003	0.0002	0.0007	0.0000	0.0001							**0.0003**	**0.0015**

EPN: ENG1
Caterpillar G398 TA HCR (Type Engine)
Engine SN:
Man. Date:
Manufacturer's Rated Horsepower 610 hp
Fuel Input 0.007804 MMBtu/hp-hr
Operating Schedule: 8760 hours annually

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Pollutant	Reference	Control Efficiency	FACTORS			EMISSIONS	
				lean	rich		
			grams/bhp-hr	lb/MMBtu	lb/MMBtu	lbs/hr	TPY
VOC_{total}	Manuf. Engine Data	-----	0.50			0.6718	2.9425
NOx	Manuf. Engine Data	-----	1.00			1.3436	5.8850
CO	Manuf. Engine Data	-----	1.00			1.3436	5.8850
PM10	AP-42	-----		0.00999	0.01941	0.0924	0.4047
PM2.5	AP-42	-----		0.00999	0.01941	0.0924	0.4047
SO2	AP-42	-----		0.00059	0.00059	0.0028	0.0123
HCHO	AP-42	-----		0.05280	0.02050	0.2514	1.1009
Benzene	AP-42	-----		0.00044	0.00158	0.0075	0.0329
Acetaldehyde	AP-42	-----		0.00836	0.00279	0.0398	0.1743
1,1-dichloroethane	AP-42	-----		0.00002	0.00001	0.0001	0.0005
1,2-dichloroethane	AP-42	-----		0.00002	0.00001	0.0001	0.0005
1,1,2-Trichloroethane	AP-42	-----		0.00003	0.00002	0.0002	0.0007
1,1,2,2-Tetrachloroethane	AP-42	-----		0.00004	0.00003	0.0002	0.0008
1,3-butadiene	AP-42	-----		0.00027	0.00066	0.0032	0.0138
1,3-dichloropropene	AP-42	-----		0.00003	0.00001	0.0001	0.0006
Benzo(e)pyrene	AP-42	-----		0.00000		0.0000	0.0000
Carbon Tetrachloride	AP-42	-----		0.00004	0.00002	0.0002	0.0008
Chloroform	AP-42	-----		0.00003	0.00001	0.0001	0.0006
Ethylene Dibromide	AP-42	-----		0.00004	0.00002	0.0002	0.0009
Methylene Chloride	AP-42	-----		0.00002	0.00004	0.0002	0.0009
PAH	AP-42	-----		0.00003	0.00014	0.0007	0.0029
Vinyl Chloride	AP-42	-----		0.00001	0.00001	0.0001	0.0003
n-Hexane	AP-42	-----		0.00111		0.0053	0.0231
2,2,4-Trimethylpentane	AP-42	-----		0.00025		0.0012	0.0052
Toluene	AP-42	-----		0.00041	0.00056	0.0027	0.0116
Ethylbenzene	AP-42	-----		0.00004	0.00002	0.0002	0.0008
Xylene	AP-42	-----		0.00018	0.00020	0.0009	0.0041
Acrolein	AP-42	-----		0.00514	0.00263	0.0245	0.1072
1,2-dichloropropane	AP-42	-----		0.00003	0.00001	0.0001	0.0006
Biphenyl	AP-42	-----		0.00021		0.0010	0.0044
Chlorobenzene	AP-42	-----		0.00003	0.00001	0.0001	0.0006
Chloroethane	AP-42	-----		0.00000		0.0000	0.0000
Cyclopentane	AP-42	-----		0.00023		0.0011	0.0047
Methanol	AP-42	-----		0.00250	0.00306	0.0146	0.0638
Methylcyclohexane	AP-42	-----		0.00123		0.0059	0.0256
n-Nonane	AP-42	-----		0.00011		0.0005	0.0023
n-Octane	AP-42	-----		0.00035		0.0017	0.0073
n-Pentane	AP-42	-----		0.00260		0.0124	0.0542
Naphthalene	AP-42	-----		0.00007	0.00010	0.0005	0.0020
Phenol	AP-42	-----		0.00002		0.0001	0.0005

Example Calculations:
NOx: ((1.0 grams/bhp-hr)(610 bhp))(1/454) = 1.3436 lbs/hr
NOx: (1.3436 lbs/hr)(8760 hrs/yr)/2000 = 5.8850 TPY

Calculation Notes:
Engine Data based on AP-42 Section 3.2, Manufacturer Engine Data Sheets

EPN: ENG2
Caterpillar G398 TA HCR (Type Engine)
Engine SN:
Man. Date:
Manufacturer's Rated Horsepower 610 hp
Fuel Input 0.007804 MMBtu/hp-hr
Operating Schedule: 8760 hours annually

non carc | carc

Pollutant	Reference	Control Efficiency	FACTORS			EMISSIONS	
				lean	rich		
			grams/bhp-hr	lb/MMBtu	lb/MMBtu	lbs/hr	TPY
VOC_{total}	Manuf. Engine Data	-----	0.50			0.6718	2.9425
NOx	Manuf. Engine Data	-----	1.00			1.3436	5.8850
CO	Manuf. Engine Data	-----	1.00			1.3436	5.8850
PM10	AP-42	-----		0.00999	0.01941	0.0924	0.4047
PM2.5	AP-42	-----		0.00999	0.01941	0.0924	0.4047
SO2	AP-42	-----		0.00059	0.00059	0.0028	0.0123
HCHO	AP-42	-----		0.05280	0.02050	0.2514	1.1009
Benzene	AP-42	-----		0.00044	0.00158	0.0075	0.0329
Acetaldehyde	AP-42	-----		0.00836	0.00279	0.0398	0.1743
1,1-dichloroethane	AP-42	-----		0.00002	0.00001	0.0001	0.0005
1,2-dichloroethane	AP-42	-----		0.00002	0.00001	0.0001	0.0005
1,1,2-Trichloroethane	AP-42	-----		0.00003	0.00002	0.0002	0.0007
1,1,2,2-Tetrachloroethane	AP-42	-----		0.00004	0.00003	0.0002	0.0008
1,3-butadiene	AP-42	-----		0.00027	0.00066	0.0032	0.0138
1,3-dichloropropene	AP-42	-----		0.00003	0.00001	0.0001	0.0006
Benzo(e)pyrene	AP-42	-----		0.00000		0.0000	0.0000
Carbon Tetrachloride	AP-42	-----		0.00004	0.00002	0.0002	0.0008
Chloroform	AP-42	-----		0.00003	0.00001	0.0001	0.0006
Ethylene Dibromide	AP-42	-----		0.00004	0.00002	0.0002	0.0009
Methylene Chloride	AP-42	-----		0.00002	0.00004	0.0002	0.0009
PAH	AP-42	-----		0.00003	0.00014	0.0007	0.0029
Vinyl Chloride	AP-42	-----		0.00001	0.00001	0.0001	0.0003
n-Hexane	AP-42	-----		0.00111		0.0053	0.0231
2,2,4-Trimethylpentane	AP-42	-----		0.00025		0.0012	0.0052
Toluene	AP-42	-----		0.00041	0.00056	0.0027	0.0116
Ethylbenzene	AP-42	-----		0.00004	0.00002	0.0002	0.0008
Xylene	AP-42	-----		0.00018	0.00020	0.0009	0.0041
Acrolein	AP-42	-----		0.00514	0.00263	0.0245	0.1072
1,2-dichloropropane	AP-42	-----		0.00003	0.00001	0.0001	0.0006
Biphenyl	AP-42	-----		0.00021		0.0010	0.0044
Chlorobenzene	AP-42	-----		0.00003	0.00001	0.0001	0.0006
Chloroethane	AP-42	-----		0.00000		0.0000	0.0000
Cyclopentane	AP-42	-----		0.00023		0.0011	0.0047
Methanol	AP-42	-----		0.00250	0.00306	0.0146	0.0638
Methylcyclohexane	AP-42	-----		0.00123		0.0059	0.0256
n-Nonane	AP-42	-----		0.00011		0.0005	0.0023
n-Octane	AP-42	-----		0.00035		0.0017	0.0073
n-Pentane	AP-42	-----		0.00260		0.0124	0.0542
Naphthalene	AP-42	-----		0.00007	0.00010	0.0005	0.0020
Phenol	AP-42	-----		0.00002		0.0001	0.0005

Example Calculations:
NOx: ((1.0 grams/bhp-hr)(610 bhp))(1/454) = 1.3436 lbs/hr
NOx: (1.3436 lbs/hr)(8760 hrs/yr)/2000 = 5.8850 TPY

Calculation Notes:
Engine Data based on AP-42 Section 3.2, Manufacturer Engine Data Sheets

EPN: ENG3
Caterpillar G3516B (Type Engine)
Engine SN:
Man. Date:
Manufacturer's Rated Horsepower 1380 hp
Fuel Input 0.008226 MMBtu/hp-hr
Operating Schedule: 8760 hours annually

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Pollutant	Reference	Control Efficiency	FACTORS			EMISSIONS	
				lean	rich		
			grams/bhp-hr	lb/MMBtu	lb/MMBtu	lbs/hr	TPY
VOC_{total}	Manuf. Engine Data	-----	0.50			1.5198	6.6568
NOx	Manuf. Engine Data	-----	1.00			3.0396	13.3137
CO	Manuf. Engine Data	-----	1.00			3.0396	13.3137
PM10	AP-42	-----		0.00999	0.01941	0.2203	0.9651
PM2.5	AP-42	-----		0.00999	0.01941	0.2203	0.9651
SO2	AP-42	-----		0.00059	0.00059	0.0067	0.0292
HCHO	AP-42	-----		0.05280	0.02050	0.5994	2.6253
Benzene	AP-42	-----		0.00044	0.00158	0.0179	0.0786
Acetaldehyde	AP-42	-----		0.00836	0.00279	0.0949	0.4157
1,1-dichloroethane	AP-42	-----		0.00002	0.00001	0.0003	0.0012
1,2-dichloroethane	AP-42	-----		0.00002	0.00001	0.0003	0.0012
1,1,2-Trichloroethane	AP-42	-----		0.00003	0.00002	0.0004	0.0016
1,1,2,2-Tetrachloroethane	AP-42	-----		0.00004	0.00003	0.0005	0.0020
1,3-butadiene	AP-42	-----		0.00027	0.00066	0.0075	0.0330
1,3-dichloropropene	AP-42	-----		0.00003	0.00001	0.0003	0.0013
Benzo(e)pyrene	AP-42	-----		0.00000		0.0000	0.0000
Carbon Tetrachloride	AP-42	-----		0.00004	0.00002	0.0004	0.0018
Chloroform	AP-42	-----		0.00003	0.00001	0.0003	0.0014
Ethylene Dibromide	AP-42	-----		0.00004	0.00002	0.0005	0.0022
Methylene Chloride	AP-42	-----		0.00002	0.00004	0.0005	0.0020
PAH	AP-42	-----		0.00003	0.00014	0.0016	0.0070
Vinyl Chloride	AP-42	-----		0.00001	0.00001	0.0002	0.0007
n-Hexane	AP-42	-----		0.00111		0.0126	0.0552
2,2,4-Trimethylpentane	AP-42	-----		0.00025		0.0028	0.0124
Toluene	AP-42	-----		0.00041	0.00056	0.0063	0.0277
Ethylbenzene	AP-42	-----		0.00004	0.00002	0.0005	0.0020
Xylene	AP-42	-----		0.00018	0.00020	0.0022	0.0097
Acrolein	AP-42	-----		0.00514	0.00263	0.0583	0.2556
1,2-dichloropropane	AP-42	-----		0.00003	0.00001	0.0003	0.0013
Biphenyl	AP-42	-----		0.00021		0.0024	0.0105
Chlorobenzene	AP-42	-----		0.00003	0.00001	0.0003	0.0015
Chloroethane	AP-42	-----		0.00000		0.0000	0.0001
Cyclopentane	AP-42	-----		0.00023		0.0026	0.0113
Methanol	AP-42	-----		0.00250	0.00306	0.0347	0.1521
Methylcyclohexane	AP-42	-----		0.00123		0.0140	0.0612
n-Nonane	AP-42	-----		0.00011		0.0012	0.0055
n-Octane	AP-42	-----		0.00035		0.0040	0.0175
n-Pentane	AP-42	-----		0.00260		0.0295	0.1293
Naphthalene	AP-42	-----		0.00007	0.00010	0.0011	0.0048
Phenol	AP-42	-----		0.00002		0.0003	0.0012

Example Calculations:
NOx: ((1.0 grams/bhp-hr)(1380 bhp))(1/454) = 3.0396 lbs/hr
NOx: (3.0396 lbs/hr)(8760 hrs/yr)/2000 = 13.3137 TPY

Calculation Notes:
Engine Data based on AP-42 Section 3.2, Manufacturer Engine Data Sheets

EPN: ENG4
Caterpillar G398 TA HCR (Type Engine)
Engine SN:
Man. Date:
Manufacturer's Rated Horsepower 203 hp
Fuel Input 0.007877 MMBtu/hp-hr
Operating Schedule: 8760 hours annually

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Pollutant	Reference	Control Efficiency	FACTORS			EMISSIONS	
				lean	rich		
			grams/bhp-hr	lb/MMBtu	lb/MMBtu	lbs/hr	TPY
VOC_{total}	Manuf. Engine Data	-----	0.35			0.1565	0.6855
NOx	Manuf. Engine Data	-----	1.00			0.4471	1.9585
CO	Manuf. Engine Data	-----	2.00			0.8943	3.9169
PM10	AP-42	-----		0.00999	0.01941	0.0310	0.1359
PM2.5	AP-42	-----		0.00999	0.01941	0.0310	0.1359
SO2	AP-42	-----		0.00059	0.00059	0.0009	0.0041
HCHO	AP-42	-----		0.05280	0.02050	0.0844	0.3698
Benzene	AP-42	-----		0.00044	0.00158	0.0025	0.0111
Acetaldehyde	AP-42	-----		0.00836	0.00279	0.0134	0.0586
1,1-dichloroethane	AP-42	-----		0.00002	0.00001	0.0000	0.0002
1,2-dichloroethane	AP-42	-----		0.00002	0.00001	0.0000	0.0002
1,1,2-Trichloroethane	AP-42	-----		0.00003	0.00002	0.0001	0.0002
1,1,2,2-Tetrachloroethane	AP-42	-----		0.00004	0.00003	0.0001	0.0003
1,3-butadiene	AP-42	-----		0.00027	0.00066	0.0011	0.0046
1,3-dichloropropene	AP-42	-----		0.00003	0.00001	0.0000	0.0002
Benzo(e)pyrene	AP-42	-----		0.00000		0.0000	0.0000
Carbon Tetrachloride	AP-42	-----		0.00004	0.00002	0.0001	0.0003
Chloroform	AP-42	-----		0.00003	0.00001	0.0000	0.0002
Ethylene Dibromide	AP-42	-----		0.00004	0.00002	0.0001	0.0003
Methylene Chloride	AP-42	-----		0.00002	0.00004	0.0001	0.0003
PAH	AP-42	-----		0.00003	0.00014	0.0002	0.0010
Vinyl Chloride	AP-42	-----		0.00001	0.00001	0.0000	0.0001
n-Hexane	AP-42	-----		0.00111		0.0018	0.0078
2,2,4-Trimethylpentane	AP-42	-----		0.00025		0.0004	0.0018
Toluene	AP-42	-----		0.00041	0.00056	0.0009	0.0039
Ethylbenzene	AP-42	-----		0.00004	0.00002	0.0001	0.0003
Xylene	AP-42	-----		0.00018	0.00020	0.0003	0.0014
Acrolein	AP-42	-----		0.00514	0.00263	0.0082	0.0360
1,2-dichloropropane	AP-42	-----		0.00003	0.00001	0.0000	0.0002
Biphenyl	AP-42	-----		0.00021		0.0003	0.0015
Chlorobenzene	AP-42	-----		0.00003	0.00001	0.0000	0.0002
Chloroethane	AP-42	-----		0.00000		0.0000	0.0000
Cyclopentane	AP-42	-----		0.00023		0.0004	0.0016
Methanol	AP-42	-----		0.00250	0.00306	0.0049	0.0214
Methylcyclohexane	AP-42	-----		0.00123		0.0020	0.0086
n-Nonane	AP-42	-----		0.00011		0.0002	0.0008
n-Octane	AP-42	-----		0.00035		0.0006	0.0025
n-Pentane	AP-42	-----		0.00260		0.0042	0.0182
Naphthalene	AP-42	-----		0.00007	0.00010	0.0002	0.0007
Phenol	AP-42	-----		0.00002		0.0000	0.0002

Example Calculations:
NOx: ((1.0 grams/bhp-hr)(203 bhp))(1/454) = 0.4471 lbs/hr
NOx: (0.4471 lbs/hr)(8760 hrs/yr)/2000 = 1.9585 TPY

Calculation Notes:
Engine Data based on AP-42 Section 3.2, Manufacturer Engine Data Sheets

Hwy 30 Heater Emission Calculations

EPN			RBLR-HTR1	RBLR-HTR2	STBL-HTR1	STBL-HTR2	ENG-HTR1	ENG-HTR2	COND-HTR1	COND-HTR2	
Name/Type			Reboiler Heater	Reboiler Heater	Stabilizer Heater	Stabilizer Heater	Engine Heater	Engine Heater	Condensate Heater	Condensate Heater	
Heater Rating (MMBtu/hr)			0.75	0.75	1.5	1.5	0.2	0.2	1.5	1.5	
Operating Hours			8760	8760	8760	8760	8760	8760	8760	8760	
Fuel Heat Value (Btu/SCF)			1230	1230	1230	1230	1230	1230	1230	1230	
Pollutant	**Emission Factor (lb/MMCF)**	**Reference**	**lb/hr**	**lb/hr**	**lb/hr**	**lb/hr**	**lb/hr**	**lb/hr**	**lb/hr**	**lb/hr**	**Emission Totals**
VOC	5.5	AP-42	0.0034	0.0034	0.0067	0.0067	0.0009	0.0009	0.0067	0.0067	0.0353
NOx	100	AP-42	0.0610	0.0610	0.1220	0.1220	0.0163	0.0163	0.1220	0.1220	0.6423
CO	84	AP-42	0.0512	0.0512	0.1024	0.1024	0.0137	0.0137	0.1024	0.1024	0.5395
PM_{10}	7.6	AP-42	0.0046	0.0046	0.0093	0.0093	0.0012	0.0012	0.0093	0.0093	0.0488
$PM_{2.5}$	5.7	AP-42	0.0035	0.0035	0.0070	0.0070	0.0009	0.0009	0.0070	0.0070	0.0366
SO_2	0.6	AP-42	0.0004	0.0004	0.0007	0.0007	0.0001	0.0001	0.0007	0.0007	0.0039
HCHO	0.075	AP-42	0.0000	0.0000	0.0001	0.0001	0.0000	0.0000	0.0001	0.0001	0.0005
Benzene	0.0021	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0034	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hexane	1.8	AP-42	0.0011	0.0011	0.0022	0.0022	0.0003	0.0003	0.0022	0.0022	0.0116
Pentane	2.6	AP-42	0.0016	0.0016	0.0032	0.0032	0.0004	0.0004	0.0032	0.0032	0.0167
Naphthalene	0.00061	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000
Benzo(a)pyrene	1.20E-06	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000
Lead	5.00E-04	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000
Arsenic	2.00E-04	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000
Barium	4.40E-03	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00003
Beryllium	1.20E-05	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000
Cadmium	1.10E-03	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00001
Chromium	1.40E-03	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00001
Cobalt	8.40E-05	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000
Copper	8.50E-04	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00001
Manganese	3.80E-04	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000
Molybdenum	2.60E-04	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000
Nickel	2.10E-03	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00001
Selenium	2.40E-05	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000
Vanadium	2.30E-03	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00001
Zinc	2.90E-02	AP-42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00019

Pollutant	**Emission Factor (lb/MMCF)**	**Reference**	**tpy**	**tpy**	**tpy**	**tpy**	**tpy**	**tpy**	**tpy**	**tpy**	**Emission Totals**
VOC	5.5	AP-42	0.0147	0.0147	0.0294	0.0294	0.0039	0.0039	0.0294	0.0294	0.1547
NOx	100	AP-42	0.2671	0.2671	0.5341	0.5341	0.0712	0.0712	0.5341	0.5341	2.8132
CO	84	AP-42	0.2243	0.2243	0.4487	0.4487	0.0598	0.0598	0.4487	0.4487	2.3631
PM_{10}	7.6	AP-42	0.0203	0.0203	0.0406	0.0406	0.0054	0.0054	0.0406	0.0406	0.2138
$PM_{2.5}$	5.7	AP-42	0.0152	0.0152	0.0304	0.0304	0.0041	0.0041	0.0304	0.0304	0.1604
SO_2	0.6	AP-42	0.0016	0.0016	0.0032	0.0032	0.0004	0.0004	0.0032	0.0032	0.0169
HCHO	0.075	AP-42	0.000200	0.000200	0.000401	0.000401	0.000053	0.000053	0.000401	0.000401	0.0021
Benzene	0.0021	AP-42	0.000006	0.000006	0.000011	0.000011	0.000001	0.000001	0.000011	0.000011	0.0001
Toluene	0.0034	AP-42	0.000009	0.000009	0.000018	0.000018	0.000002	0.000002	0.000018	0.000018	0.0001
Hexane	1.8	AP-42	0.004807	0.004807	0.009615	0.009615	0.001282	0.001282	0.009615	0.009615	0.0506
Pentane	2.6	AP-42	0.006944	0.006944	0.013888	0.013888	0.001852	0.001852	0.013888	0.013888	0.0731
Naphthalene	0.00061	AP-42	0.000002	0.000002	0.000003	0.000003	0.000000	0.000000	0.000003	0.000003	0.0000
Benzo(a)pyrene	1.20E-06	AP-42	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000
Lead	5.00E-04	AP-42	0.000001	0.000001	0.000003	0.000003	0.000000	0.000000	0.000003	0.000003	0.0000
Arsenic	2.00E-04	AP-42	0.000001	0.000001	0.000001	0.000001	0.000000	0.000000	0.000001	0.000001	0.0000
Barium	4.40E-03	AP-42	0.000012	0.000012	0.000024	0.000024	0.000003	0.000003	0.000024	0.000024	0.0001
Beryllium	1.20E-05	AP-42	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000
Cadmium	1.10E-03	AP-42	0.000003	0.000003	0.000006	0.000006	0.000001	0.000001	0.000006	0.000006	0.0000
Chromium	1.40E-03	AP-42	0.000004	0.000004	0.000007	0.000007	0.000001	0.000001	0.000007	0.000007	0.0000
Cobalt	8.40E-05	AP-42	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000
Copper	8.50E-04	AP-42	0.000002	0.000002	0.000005	0.000005	0.000001	0.000001	0.000005	0.000005	0.0000
Manganese	3.80E-04	AP-42	0.000001	0.000001	0.000002	0.000002	0.000000	0.000000	0.000002	0.000002	0.0000
Molybdenum	2.60E-04	AP-42	0.000001	0.000001	0.000001	0.000001	0.000000	0.000000	0.000001	0.000001	0.0000
Nickel	2.10E-03	AP-42	0.000006	0.000006	0.000011	0.000011	0.000001	0.000001	0.000011	0.000011	0.0001
Selenium	2.40E-05	AP-42	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000
Vanadium	2.30E-03	AP-42	0.000006	0.000006	0.000012	0.000012	0.000002	0.000002	0.000012	0.000012	0.0001
Zinc	2.90E-02	AP-42	0.000077	0.000077	0.000155	0.000155	0.000021	0.000021	0.000155	0.000155	0.0008

Calculation Notes:
Natural Gas Combustion Factor Data based on AP-42, Table 1.4-1 - 1.4.3.

FUGITIVE EMISSION CALCULATIONS

EPN: FUG1

Component Type	Gas Component Count	Heavy Oil Component Count	Light Oil Component Count	Water/Light Oil Component Count
Valves	1500	500	500	24
Pumps	0	4	0	1
Flanges / Connectors	1500	500	500	17
Compressors	5	0	0	0
Relief Lines	15	0	2	2
Open-ended Lines	4	0	0	1
Other	0	0	6	6
Process Drains	11	17	14	7

Component Type	Gas lb/hr per component	Heavy Oil lb/hr per component	Light Oil lb/hr per component	Water/Light Oil lb/hr per component	Gas Emission Rate (lbs/hr)	Heavy Oil Emssion Rate (lbs/hr)	Light Oil Emission Rate (lbs/hr)	Water/ Light Oil Emission Rate (lbs/hr)	Control Efficiency %	Control Efficiency %	Total Emissions lbs/hr	Total Emissions tn/yr
Valves	0.0099	0.00002	0.0055	0.0002	2.9641	0.0093	2.7500	0.0052	85%		0.8716	3.8174
Pumps	0.0053	0.0011	0.0287	0.0001	0.0000	0.0045	0.0000	0.0001	85%		0.0046	0.0200
Flanges / Connectors	0.0009	0.000001	0.0002	0.0000	0.2570	0.000430	0.1215	0.0001	85%	30%	0.2653	1.1622
Compressors	0.0194	0.0001	0.0165	0.0309	0.0193	0.000000	0.0000	0.0000	85%		0.0029	0.0127
Relief Lines	0.0194	0.0001	0.0165	0.0309	0.0580	0.000000	0.0330	0.0618	85%		0.0229	0.1004
Open-ended Lines	0.0044	0.0003	0.0031	0.0006	0.0035	0.000000	0.0000	0.0006	85%		0.0006	0.0027
Other	0.0194	0.0001	0.0165	0.0309	0.0000	0.000000	0.0990	0.1854	0%		0.2844	1.2457
Process Drains	0.0194	0.0001	0.0165	0.0309	0.0425	0.0012	0.2310	0.2163	0%		0.4910	2.1505
Totals											**1.9433**	**8.5115**

Component	Mole Wt	Mole%	lb/mol Mix	Wt%	Percentage	EMISSIONS lbs/hr	EMISSIONS TPY
Methane	16.043	86.8514	13.934	67.973	**68.0%**		
Nitrogen	28.013	0.5378	0.151	0.735	**0.7%**		
Carbon Dioxide	44.01	0.1909	0.084	0.410	**0.4%**		
Ethane	30.07	7.4726	2.247	10.962	**11.0%**	VOC	
Hydrogen Sulfide	34.08	0.0000	0.000	0.000	**0.0%**	Speciation	
Propane	44.097	3.9735	1.752	8.548	**8.5%**	0.1661	0.7276
Iso-butane	58.124	0.8460	0.492	2.399	**2.4%**	0.0466	0.2042
N-Butane	58.124	1.3749	0.799	3.899	**3.9%**	0.0758	0.3318
Iso-Pentane	72.151	0.4032	0.291	1.419	**1.4%**	0.0276	0.1208
N-Pentane	72.151	0.4127	0.298	1.453	**1.5%**	0.0282	0.1236
N-Hexane	86.07	0.1561	0.134	0.655	**0.7%**	0.0127	0.0558
Cyclohexane	84.16	0.0481	0.040	0.197	**0.2%**	0.0038	0.0168
Heptanes	100.21	0.1119	0.112	0.547	**0.5%**	0.0106	0.0466
Methylcyclohexane	96.17	0.0287	0.028	0.135	**0.1%**	0.0026	0.0115
224-Trimethylpentane	114.22	0.0000	0.000	0.000	**0.0%**	0.0000	0.0000
Benzene	78.11	0.0217	0.017	0.083	**0.1%**	0.0016	0.0070
Toluene	92.14	0.0097	0.009	0.044	**0.0%**	0.0008	0.0037
Ethylbenzene	106.17	0.0054	0.006	0.028	**0.0%**	0.0005	0.0024
Xylenes	106.16	0.0108	0.011	0.056	**0.1%**	0.0011	0.0048
Hexanes +	92.12	0.0530	0.049	0.238	**0.2%**	0.0046	0.0203
C8 Heavies	96.09	0.0470	0.045	0.220	**0.220%**	0.0043	0.0188
		7.50	20.499	100.000	100%		
		102.56	**VOC**	**19.920**	19.9%		

Notes:
Gas Analysis - Questar Applied Technology, 1/3/2013, ML Investments 1-10

HIGH PRESSURE FLARE
VOC EMISSION CALCULATION

Basis

Molar flow of each VOC constituent to the flare (flare inlet) is based on the composite gas analysis.
Flare removal efficiency = 98%
Molar volume = 379.5 scf/mole

	Composite Gas Composition		Flare Inlet	Flare Outlet 98% DRE)		
Constituent	mole/day	mole weight	lb/day	lb/day	lb/hr	tn/yr
Propane	13.1926	44.09	581.664	11.633	0.485	2.123
Iso-butane	2.8089	58.12	163.251	3.265	0.136	0.596
Butane	4.5649	58.12	265.311	5.306	0.221	0.968
Iso-Pentane	1.3387	72.15	96.586	1.932	0.080	0.353
Pentane	1.3702	72.15	98.862	1.977	0.082	0.361
Benzene	0.0720	78.11	5.628	0.113	0.005	0.021
Toluene	0.0322	92.14	2.967	0.059	0.002	0.011
Ethylbenzene	0.0179	106.20	1.904	0.038	0.002	0.007
Xylenes	0.0359	106.20	3.808	0.076	0.003	0.014
Hexanes	0.1760	86.18	15.165	0.303	0.013	0.055
Heptanes	0.3715	100.21	37.231	0.745	0.031	0.136
Octanes	0.1169	114.20	13.347	0.267	0.011	0.049
Iso-octane	0.0080	114.20	0.910	0.018	0.001	0.003
Nonanes	0.0139	128.20	1.788	0.036	0.001	0.007
Decanes+	0.0173	142.30	2.457	0.049	0.002	0.009
n-Hexane	0.5183	86.18	44.665	0.893	0.037	0.163
Cyclohexane	0.1597	84.20	13.447	0.269	0.011	0.049
Methylcyclohexane	0.0953	98.20	9.357	0.187	0.008	0.034
Cyclopentane	0.3871	70.10	27.138	0.543	0.023	0.099
		Summation of VOC Constituents			**1.155**	**5.057**

Sample Calculations - Flare Outlet - Propane

Hourly: (13.1926 mole of Propane/day) (day/24 hr) (44.1 lb/mole) (1 - 0.98) = 0.485 lb of Propane/hr
Annual: (13.1926 mole of Propane/day) (365 day/yr) (44.1 lb/mole) (1 - 0.98) (tn/2,000 lb) = 2.123 tn of Propane/yr

HIGH PRESSURE FLARE
COMBUSTION BY-PRODUCTS EMISSION CALCULATIONS

Basis for NOx and CO Emission Calculations

NOx emission factor = 0.068 lb/MMBtu (AP-42 Table 13-5-1)
CO emission factor = 0.31 lb/MMBtu (AP-42 Table 13-5-2)
Hourly heat input = 5.948 MMBtu/hr (HP Flare Net Heat Input analysis)
Annual heat input = 52100.2 MMBtu/yr (HP Flare Net Heat Input analysis)

		Hourly		Annual	
	Emission Factor	Net Heat Input	Emissions	Net Heat Input	Emissions
	lb/MMBtu	MMBtu/hr	lb/hr	MMBtu/yr	tn/yr
NOx	0.068	5.948	0.404	52100.2	1.771
CO	0.31	5.948	1.844	52100.2	8.076

Sample Calculations

Hourly NOx Emissions: (0.068 lb of NOx/MMBtu) (5.948 MMBtu/hr) = 0.404 lb of NOx/hr
Annual NOx Emissions: (0.068 lb of NOx/MMBtu) (52,100 MMBtu/yr) (1 tn/2,000 lb) = 1.771 tn of NOx/yr

Basis for PM10, PM2.5, and SO2 Emission Calculations

PM10, PM2.5, and SO2 emission factors from AP-42 Table 1.4-2.
PM10/PM2.5 emission factor = 1.9 lb/MMscf (filterable faction only, condensible organics not expected due to high dew point of organics)
SO2 emission factor = 0.6 lb/MMscf (no H2S in composite gas)
Waste/pilot gas flow = 126,000 scf/day (plant specification)
Hourly waste & pilot gas flow = 5250.0 scf/hr (126000 scf/day * day/24 hr)
Annual waste & pilot gas flow = 45.990 MMscf/yr (126000 scf/day * 365 day/yr * MMscf/1,000,000 scf)

		Hourly		Annual	
	Emission Factor	Composite Gas Flow	Emissions	Composite Gas Flow	Emissions
	lb/MMscf	scf/hr	lb/hr	MMscf/yr	tn/yr
PM10/PM2.5	1.9	5250.0	0.010	45.990	0.044
SO2	0.6	5250.0	0.003	45.990	0.014

Sample Calculations

Hourly PM10 Emissions: (1.9 lb of PM10/MMscf) (5,250.0 scf/hr) (MMscf/1,000,000 scf) = 0.010 lb of PM10/hr
Annual PM10 Emissions: (1.9 lb of PM10/MMscf) (45.990 MMscf/yr) (1 tn/2,000 lb) = 0.044 tn of PM10/yr

HIGH PRESSURE FLARE
NET HEAT INPUT

Basis
Molar flow (mole/day) of each listed organic constituent to the flare is based on the composite gas analysis.
Molar volume = 379.5 scf/mole

	Composite Gas	Waste/Pilot Gas Flow			Net Heating Value	Net Heat Input	
Constituent	**mole/day**	**scf/day**	**scf/hr**	**MMscf/yr**	**Btu/scf**	**MMBtu/hr**	**MMBtu/yr**
Methane	288.3604	109432.76	4559.70	39.943	911	4.154	36388.0
Ethane	24.8102	9415.48	392.31	3.437	1631	0.640	5605.2
Propane	13.1926	5006.61	208.61	1.827	2353	0.491	4299.9
Iso-butane	2.8089	1065.96	44.42	0.389	3094	0.137	1203.8
Butane	4.5649	1732.37	72.18	0.632	3101	0.224	1960.8
Iso-Pentane	1.3387	508.03	21.17	0.185	3698	0.078	685.7
Pentane	1.3702	520.00	21.67	0.190	3709	0.080	704.0
Benzene	0.0720	27.34	1.14	0.010	3591	0.004	35.8
Toluene	0.0322	12.22	0.51	0.004	4274	0.002	19.1
Ethylbenzene	0.0179	6.80	0.28	0.002	4971	0.001	12.3
Xylenes	0.0359	13.61	0.57	0.005	4958	0.003	24.6
Hexanes	0.1760	66.78	2.78	0.024	4404	0.012	107.3
Heptanes	0.3715	140.99	5.87	0.051	5100	0.030	262.5
Octanes	0.1169	44.35	1.85	0.016	5796	0.011	93.8
Iso-octane	0.0080	3.02	0.13	0.001	5796	0.001	6.4
Nonanes	0.0139	5.29	0.22	0.002	6493	0.001	12.5
Decanes+	0.0173	6.55	0.27	0.002	7190	0.002	17.2
n-Hexane	0.5183	196.69	8.20	0.072	4404	0.036	316.2
Cyclohexane	0.1597	60.61	2.53	0.022	4180	0.011	92.5
Methylcyclohexane	0.0953	36.16	1.51	0.013	4864	0.007	64.2
Cyclopentane	0.3871	146.92	6.12	0.054	3512	0.021	188.3
				Summation of Net Heat Inputs		**5.948**	**52100.2**

Sample Calculations
Methane - hourly net heat input: (288.3604 mole/day) (day/24 hr) (379.5 scf/mole) (911 Btu/scf) (MMBtu/1,000,000 scf) = 4.154 MMBtu/hr
Methane - annual net heat input: (288.3604 mole/day) (365 day/yr) (379.5 scf/mole) (911 Btu/scf) (MMBtu/1,000,000 Btu) = 36,388.0 MMBtu/yr

HIGH PRESSURE FLARE
WASTE & PILOT GAS COMPOSITE

Basis

A composite gas composition is developed using maximum mole percent of each gas constituent from each of the 7 raw gas analysis
Waste/pilot gas flow = 126,000 scf/day (plant specification)
Molar volume = 379.5 scf/mole

	Kauffman 1-9	LWR 4-inch	LWR 12-inch	ML 1-10	ML 1-11lt	ML 1-11ut	ML 2-10	Composite Gas Composition	
Constituent	mole %	mole %	mole %	mole %	mole %	mole %	mole %	mole %	mole/day
Hydrogen Sulfide	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nitrogen	0.5204	0.5055	0.5191	0.4816	0.5378	0.5295	0.5330	0.5378	1.7856
Carbon Dioxide	0.1909	0.0931	0.1057	0.1404	0.0590	0.1369	0.0279	0.1909	0.6338
Methane	85.9296	86.8514	85.8207	85.8560	85.7393	85.0144	85.8733	86.8514	288.3604
Ethane	5.9644	6.5474	6.6773	6.1437	6.9272	7.4726	6.7280	7.4726	24.8102
Propane	3.7786	3.5039	3.8435	3.8164	3.8778	3.9735	3.8828	3.9735	13.1926
Iso-butane	0.8460	0.6713	0.7799	0.8202	0.7602	0.7568	0.7771	0.8460	2.8089
Butane	1.3749	1.0406	1.2378	1.3487	1.1879	1.1862	1.2216	1.3749	4.5649
Iso-Pentane	0.4032	0.2556	0.3221	0.3905	0.2911	0.2916	0.3060	0.4032	1.3387
Pentane	0.4127	0.2500	0.3209	0.4047	0.2850	0.2871	0.3016	0.4127	1.3702
Benzene	0.0196	0.0015	0.0012	0.0217	0.0020	0.0027	0.0017	0.0217	0.0720
Toluene	0.0089	0.0041	0.0053	0.0097	0.0060	0.0068	0.0057	0.0097	0.0322
Ethylbenzene	0.0054	0.0015	0.0027	0.0025	0.0036	0.0023	0.0014	0.0054	0.0179
Xylenes	0.0108	0.0035	0.0027	0.0077	0.0068	0.0056	0.0038	0.0108	0.0359
Hexanes	0.0518	0.0281	0.0370	0.0530	0.0318	0.0332	0.0340	0.0530	0.1760
Heptanes	0.1031	0.0698	0.0935	0.1119	0.0817	0.0892	0.0896	0.1119	0.3715
Octanes	0.0332	0.0120	0.0183	0.0352	0.0182	0.0199	0.0171	0.0352	0.1169
Iso-octane	0.0022	0.0009	0.0013	0.0024	0.0010	0.0011	0.0010	0.0024	0.0080
Nonanes	0.0042	0.0018	0.0021	0.0027	0.0026	0.0022	0.0019	0.0042	0.0139
Decanes+	0.0052	0.0024	0.0008	0.0015	0.0031	0.0026	0.0019	0.0052	0.0173
n-Hexane	0.1500	0.0767	0.1029	0.1561	0.0872	0.0911	0.0940	0.1561	0.5183
Cyclohexane	0.0442	0.0052	0.0079	0.0481	0.0068	0.0068	0.0068	0.0481	0.1597
Methylcyclohexane	0.0260	0.0117	0.0152	0.0287	0.0139	0.0152	0.0148	0.0287	0.0953
Cyclopentane	0.1147	0.0620	0.0821	0.1166	0.0700	0.0727	0.0750	0.1166	0.3871

Sample Calculations

Methane - mole/day: (126,000 scf/day) (mole/379.5 scf) (86.8514/100) = 288.360 mole of Methane/day

LOW PRESSURE FLARE
VOC EMISSION CALCULATION

Basis

Mole percent of each organic constituent to the flare (flare inlet) is based on prediction by E&P TANK V2.0 report.
Waste/pilot gas flow = 126,000 scf/day (plant specification)
Molar volume = 379.5 scf/mole
Flare removal efficiency = 98%

	Waste/Pilot Gas Composition			Flare Inlet	Flare Outlet (98% DRE)		
Constituent	mole percent	mole/day	mole weight	lb/day	lb/day	lb/hr	tn/yr
Methane	52.9548	175.818	16.04	2820.126	56.403	2.350	10.293
Ethane	14.2231	47.223	30.07	1419.994	28.400	1.183	5.183
Propane	15.2809	50.735	44.09	2236.906	44.738	1.864	8.165
Iso-butane	3.6860	12.238	58.12	711.279	14.226	0.593	2.596
Butane	6.7816	22.516	58.12	1308.629	26.173	1.091	4.776
Iso-Pentane	1.9854	6.592	72.15	475.601	9.512	0.396	1.736
Pentane	2.0575	6.831	72.15	492.873	9.857	0.411	1.799
Benzene	0.0153	0.051	78.11	3.968	0.079	0.003	0.014
Toluene	0.0142	0.047	92.14	4.344	0.087	0.004	0.016
Ethylbenzene	0.0029	0.010	106.20	1.023	0.020	0.001	0.004
Xylenes	0.0092	0.031	106.20	3.244	0.065	0.003	0.012
Hexanes	0.7668	2.546	86.18	219.405	4.388	0.183	0.801
Heptanes	1.0627	3.528	100.21	353.574	7.071	0.295	1.291
Octanes	0.2413	0.801	114.20	91.492	1.830	0.076	0.334
Nonanes	0.0556	0.185	128.20	23.666	0.473	0.020	0.086
Decanes+	0.0109	0.036	142.30	5.150	0.103	0.004	0.019
n-Hexane	0.8241	2.736	86.18	235.801	4.716	0.197	0.861
Iso-octane	0.0278	0.092	114.20	10.541	0.211	0.009	0.038
			Summation of VOC Constituents			5.148	22.548

Sample Calculations - Methane

Molar flow - mole/day: (126,000 scf/day) (mole/379.5 scf) (52.9548/100) = 175.818 mole of Methane/day
Hourly Emissions: (175.818 mole of Methane/day) (day/24 hr) (16.04 lb/mole) (1 - 0.98) = 2.350 lb of Methane/hr
Annual Emissions: (175.818 mole of Methane/day) (365 day/yr) (16.04 lb/mole) (1 - 0.98) (tn/2,000 lb) = 10.293 tn of Methane/yr

LOW PRESSURE FLARE
COMBUSTION BY-PRODUCTS EMISSION CALCULATIONS

Basis for NOx and CO Emission Calculations

NOx emission factor = 0.068 lb/MMBtu (AP-42 Table 13-5-1)
CO emission factor = 0.31 lb/MMBtu (AP-42 Table 13-5-2)
Hourly heat input = 8.894 MMBtu/hr (LP Flare Net Heat Input analysis)
Annual heat input = 77908.9 MMBtu/yr (LP Flare Net Heat Input analysis)

		Hourly		Annual	
	Emission Factor	Net Heat Input	Emissions	Net Heat Input	Emissions
	lb/MMBtu	MMBtu/hr	lb/hr	MMBtu/yr	tn/yr
NOx	0.068	8.894	0.605	77908.9	2.649
CO	0.31	8.894	2.757	77908.9	12.076

Sample Calculations

Hourly NOx Emissions: (0.068 lb of NOx/MMBtu) (8.894 MMBtu/hr) = 0.605 lb of NOx/hr
Annual NOx Emissions: (0.068 lb of NOx/MMBtu) (77,908.9 MMBtu/yr) (1 tn/2,000 lb) = 2.649 tn of NOx/yr

Basis for PM10, PM2.5, and SO2 Emission Calculations

PM10, PM2.5, and SO2 emission factors from AP-42 Table 1.4-2.
PM10/PM2.5 emission factor = 1.9 lb/MMscf (filterable faction only, condensible organics not expected due to high dew point of organics)
SO2 emission factor = 0.6 lb/MMscf (no H2S in waste/pilot gas)
Waste/pilot gas flow = 126,000 scf/day (plant specification)
Hourly waste & pilot gas flow = 5250.0 scf/hr (126,000 scf/day * day/24 hr)
Annual waste & pilot gas flow = 45.990 MMscf/yr (126,000 scf/day * 365 day/yr * MMscf/1,000,000 scf)

		Hourly		Annual	
	Emission Factor	Waste Gas Flow	Emissions	Waste Gas Flow	Emissions
	lb/MMscf	scf/hr	lb/hr	MMscf/yr	tn/yr
PM10/PM2.5	1.9	5250.0	0.010	45.990	0.044
SO2	0.6	5250.0	0.003	45.990	0.014

Sample Calculations

Hourly PM10 Emissions: (1.9 lb of PM10/MMscf) (5,250.0 scf/hr) (MMscf/1,000,000 scf) = 0.010 lb of PM10/hr
Annual PM10 Emissions: (1.9 lb of PM10/MMscf) (45.990 MMscf/yr) (1 tn/2,000 lb) = 0.044 tn of PM10/yr

LOW PRESSURE FLARE
NET HEAT INPUT

Basis
Molar flow of each organic constituent to the flare (flare inlet) is based on E&P TANK V2.0 report.
Molar volume = 379.5 scf/mole

	Composite Gas	Waste/Pilot Gas Flow			Net Heating Value	Net Heat Input	
Constituent	mole/day	scf/day	scf/hr	MMscf/yr	Btu/scf	MMBtu/hr	MMBtu/yr
Methane	175.818	66723.05	2780.13	24.354	911	2.533	22186.4
Ethane	47.223	17921.11	746.71	6.541	1631	1.218	10668.7
Propane	50.735	19253.93	802.25	7.028	2353	1.888	16536.1
Iso-butane	12.238	4644.36	193.52	1.695	3094	0.599	5244.9
Butane	22.516	8544.82	356.03	3.119	3101	1.104	9671.6
Iso-Pentane	6.592	2501.60	104.23	0.913	3698	0.385	3376.6
Pentane	6.831	2592.45	108.02	0.946	3709	0.401	3509.6
Benzene	0.051	19.28	0.80	0.007	3591	0.003	25.3
Toluene	0.047	17.89	0.75	0.007	4274	0.003	27.9
Ethylbenzene	0.010	3.65	0.15	0.001	4971	0.001	6.6
Xylenes	0.031	11.59	0.48	0.004	4958	0.002	21.0
Hexanes	2.546	966.17	40.26	0.353	4404	0.177	1553.1
Heptanes	3.528	1339.00	55.79	0.489	5100	0.285	2492.6
Octanes	0.801	304.04	12.67	0.111	5796	0.073	643.2
Nonanes	0.185	70.06	2.92	0.026	6493	0.019	166.0
Decanes+	0.036	13.73	0.57	0.005	7190	0.004	36.0
n-Hexane	2.736	1038.37	43.27	0.379	4404	0.191	1669.1
Iso-octane	0.092	35.03	1.46	0.013	5796	0.008	74.1
				Summation of Heat Inputs		**8.894**	**77908.9**

Sample Calculations
Methane - hourly net heat input: (175.818 mole/day) (day/24 hr) (379.5 scf/mole) (911 Btu/scf) (MMBtu/1000000 scf) = 2.533 MMBtu/hr
Methane - annual net heat input: (175.818 mole/day) (365 day/yr) (379.5 scf/mole) (911 Btu/scf) (MMBtu/1000000 Btu) = 22,186.4 MMBtu/yr

NWGP

Hwy 30 Treating Facility GHG Emission Summary

GHG Pollutant	Caterpillar G398 TA	Caterpillar G3516B	Caterpillar G3306	Heaters	Flare 1	Flare 2	Emission Totals
	ENG1 & ENG2	ENG3	ENG4	See Heater Page	High Pressure	Low Pressure	
	Metric Ton CO2e	Metric Ton CO2e	Metric Ton CO2e	Metric Ton CO2e	Metric Ton CO2e	Metric Ton CO2e	
CO2	4422.0222	5272.4397	742.6783	3669.1961	2762.3519	4130.7299	**20999.4181**
CH4	1.7515	2.0883	0.2942	1.4533	1.0941	1.6361	**8.3174**
N2O	2.5855	3.0827	0.4342	2.1453	1.6151	2.4152	**12.2780**
Total GHG Metric Ton CO2e							**21020.01**

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: August 14, 2017

TO: Kelli Wetzel, Permit Writer, Air Program

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

PROJECT: P-2013.0059 PROJ 61908, PTC for Modifications to the Northwest Gas Processing, LLC, Highway 30 Treating Facility in Payette County, ID

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
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
DEM	Digital Elevation Map
DEQ	Idaho Department of Environmental Quality
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
GEP	Good Engineering Practice
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
HWY 30	Highway 30 Treating Facility
K	Kelvin
m	Meters
m/sec	Meters per second
NAAQS	National Ambient Air Quality Standards
NAD83	North American Datum of 1983
NED	National Elevation Dataset
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NWS	National Weather Service
O_3	Ozone
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
ppb	parts per billion
PRIME	Plume Rive Model Enhancement
PTC	Permit to Construct
PTE	Potential to Emit
SIL	Significant Impact Level
SO_2	Sulfur Dioxide

TAP	Toxic Air Pollutant
TCEQ	Texas Commission on Environmental Quality
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
W&A	Wolcott & Associates ECS, LLC
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

Northwest Gas Processing, LLC (NWGP) submitted a Permit to Construct (PTC) application for proposed modifications to their Highway 30 Treating (HWY 30) Facility, located about ¾ mile north of the State Highway 30 and U.S. Highway 84 intersection and about 3.5 miles south of New Plymouth, Idaho. The PTC application was received on June 16, 2017. DEQ determined the application was complete on July 17, 2017.

This memorandum provides a summary of the ambient air impact analyses submitted with the permit application. It also describes DEQ's review of those analyses, DEQ's verification and sensitivity analyses, additional clarifications, and conclusions.

Project-specific air quality analyses involving atmospheric dispersion modeling of estimated emissions associated with the facility were submitted to DEQ to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard as required by the Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03).

Wolcott & Associates ECS, LLC (W&A), on behalf of NWGP, prepared the PTC application and performed the ambient air impact analyses for this project to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Toxic Air Pollutants (TAPs). The DEQ review of submitted data and 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 the proposed modification of the facility 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 emissions estimates was the responsibility of the DEQ permit writer and is addressed in the main body of the DEQ Statement of Basis, and emissions calculation methods were not evaluated in this modeling review memorandum.

The submitted information and analyses, in combination with DEQ's verification 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 ambient air impacts exceeding allowable TAP increments.

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 and analyses, in combination with DEQ's analyses, demonstrated to the satisfaction of the Department that operation of the proposed modification of facility will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility

design capacity or operations as limited by a federally enforceable permit condition. 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 representing design capacity or permit allowable rates.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
General Emissions Rates. Emissions rates used in the dispersion modeling analyses, as listed in this memorandum, must represent maximum potential emissions as given by design capacity 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 modeling analyses.
Below Regulatory Concern for Criteria Pollutant Emissions. Maximum non-fugitive annual emissions of sulfur dioxide (SO_2) and lead (Pb) are below levels identified as below regulatory concern (BRC) as per Idaho Air Rules Section 221, and the project or facility would be exempt from permitting if it were not for uncontrolled emissions of some criteria pollutants exceeding BRC threshold levels.	Idaho Air Rules Section 203.02, requiring air impact analyses demonstrating compliance with NAAQS, is not applicable to pollutants having a project-emissions increase that is less than BRC levels, provided the project would have qualified for a BRC permitting exemption except for the emissions levels of another criteria pollutant exceeding the ton/year BRC threshold.
Stack Parameter Variability. Provided the equipment installed and operated at the HWY 30 site is representative of what was described in the application, moderate variability in operational parameters, other than a decrease in stack heights or the addition of structures not accounted for in the submitted analyses, will not change the conclusion of the NAAQS compliance demonstration. Such parameters include operational load levels of the engine, heaters, and flare, stack diameters, and stack exhaust temperatures.	DEQ performed a sensitivity analysis using values for emissions release parameters that were more conservative than those used in the submitted analyses. Results of sensitivity analyses still easily demonstrated compliance with NAAQS.

Permit Application History

- **11/14/2016:** DEQ receives initial permit application.
- **12/14/2016:** DEQ determines the application to be complete.
- **1/27/2017:** During technical review DEQ found that on-site buildings were not reasonably represented in the model. This invalidates the air impact analyses and DEQ denied the permit.
- **4/28/2017:** DEQ received revised air impact analyses and associated report as a protocol.
- **6/13/2017:** DEQ received the revised permit application for the HWY 30 facility modification.
- **7/13/2017:** DEQ determined the application to be complete.

2.0 Background Information

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

2.1 Project Description

The NWGP HWY 30 facility is permitted to treat recovered raw gas in producing a pipeline quality gas and natural gas liquids. The proposed modification will expand the processing capacity of the facility. This will involve construction and operation of additional gas processing equipment. Additional air pollutant emitting sources will include three gas-fired compressor engines, three natural gas heaters, and two gas flares.

2.2 Proposed Location and Area Classification

The NWGP facility is located about ¾ mile north of the State Highway 30 and U.S. Highway 84 intersection and about 3.5 miles south of New Plymouth, Idaho, within Payette County. This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

2.3 Air Impact Analyses Required for All Permits to Construct

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.*

A NAAQS compliance demonstration is required for each criteria pollutant emitted as a result of operation of the new facility or modification of the facility, unless those emissions meet the requirements of a Below Regulatory Concern (BRC) exemption. Section 3.3.1 of this memorandum describes applicability of the NAAQS compliance demonstrations.

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

> ***02. 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).*

2.4 *Significant Impact Level and Cumulative NAAQS Impact Analyses*

The Significant Impact Level (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 in accordance with methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

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 potential/allowable 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.

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 time periods 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 emissions increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1]; 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 resulted in modeled 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.

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	0.3	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]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[s] (188 $\mu g/m^3$)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	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.
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. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 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.
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.

2.5 *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 toxic air pollutants (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.

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 the proposed modification of the HWY 30 facility were provided by W&A for various applicable averaging periods.

Review and approval of estimated emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emissions estimates is not addressed in this modeling memorandum. DEQ air impact analyses review included verification that the potential emissions rates provided in the emissions inventory 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. All modeled criteria air pollutant and TAP emissions rates must be equal to or greater than the representative potential/allowable emissions.

3.1.1 Modeling Applicability and Modeled Criteria Pollutant Emissions Rates

Facility-wide potential to emit (PTE) values for SO_2 and Pb qualify for a below regulatory concern (BRC) permit exemption as per Idaho Air Rules Section 221 since emissions are less than the BRC threshold of 10 percent of emissions defined by Idaho Air Rules as significant. 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 permit writer should assure that the final emissions inventory indicates that facility-wide controlled PTE emissions of SO_2 and Pb are below BRC levels, as listed in Table 3. Table 3 also indicates that air impact analyses for $PM_{2.5}$, PM_{10}, CO and NO_2 are required for permit issuance. An air impact analysis must be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS. Facility-wide emissions of CO, NOx, $PM_{2.5}$, and PM_{10} from operation of the HWY 30 facility and the proposed modification do not qualify for the BRC exclusion because allowable emissions will exceed BRC threshold levels.

Table 3. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY

Criteria Pollutant	BRC Level (ton/year)	Applicable Facility Wide PTE or Increase in Emissions (ton/year)	Air Impact Analyses Required?
PM_{10}[a]	1.5	1.68 (2.2[c])	Yes
$PM_{2.5}$[b]	1.0	1.66 (2.2[c])	Yes
Carbon Monoxide (CO)	10.0	44.22 (51.5[c])	Yes
Sulfur Dioxide (SO_2)	4.0	0.10[c]	No
Nitrogen Oxides (NOx)	4.0	26.72 (34.3[c])	Yes
Lead (Pb)	0.06	Negligible	No

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.
c. Facility-wide emissions.

Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption from NAAQS compliance demonstrations. DEQ has developed Modeling Applicability Thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses, used to develop the modeling threshold values, provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific Modeling Applicability Thresholds are provided in the *Idaho Air Modeling Guideline*[2]. These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

If project-specific total emissions rates of a pollutant are below Level I Modeling Applicability Thresholds, then project-specific air impact analyses are not necessary for permitting. Use of Level II Modeling Thresholds are conditional, requiring DEQ approval. DEQ approval is based on dispersion-affecting characteristics of the emissions sources such as stack height, stack gas exit velocity, stack gas temperature, distance from sources to ambient air, presence of elevated terrain, and potential exposure to sensitive public receptors.

DEQ determined that Level II Modeling Applicability Thresholds are not appropriate for the proposed HWY 30 project. Level II thresholds were based on modeling of a hypothetical source with less conservative parameters than was used in modeling to support Level I thresholds. Table 4 compares

dispersion-affecting parameters associated with the proposed project to those used in modeling analyses establishing the Level II thresholds. DEQ determined Level II Modeling Applicability Thresholds were not appropriate for the site based on the short stack heights of the sources and the very short distance from sources to ambient air. Table 5 provides a summary of the site-specific modeling applicability analysis.

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.

Table 4. COMPARISON OF DISPERSION PARAMETERS BETWEEN LEVEL II THRESHOLD MODELING AND THE PROPOSED PROJECT

Parameter	Analyses for Level II Modeling	Proposed Project
Stack Height (meters)	15	<8.5 for all sources
Stack Temperature at Exit (°F)	260	>800 for engines 1,832 for flares
Stack Gas Velocity at Exit (meters/second)	20	10-50 for engines 20 for flares
Total Flow Volume (acfm)	33,288	1,200-8,300 for engines 11,000-15,000 for flares
Distance to Ambient Air (meters)	100	~50 for engines 24 for flares
Presence of Buildings	10m X 10m X 5m high building	Multiple buildings 3.3-6.5 meters high
Potential for Exposure to Sensitive Receptors	Moderate	Low

Table 5. SITE-SPECIFIC MODELING APPLICABILITY ANALYSIS RESULTS

Pollutant	Averaging Period	Emissions	Level I Modeling Thresholds	Level II Modeling Thresholds[a]	Site-Specific Modeling Required
PM_{10}	24-hour	0.38 lb/hr	0.22	2.6	Yes
$PM_{2.5}$	24-hour	0.38 lb/hr	0.054	0.63	Yes
	Annual	1.66 ton/yr	0.35	4.1	Yes
NOx	1-hour	6.10 lb/hr	0.20	2.4	Yes
	Annual	26.72 ton/yr	1.2	14	Yes
CO	1-hour, 8-hour	10.10 lb/hr	15	175	No
Pb	monthly	<14 lb/month	14		No

a. Level II Modeling Thresholds were not approved by DEQ for this project.

Addressing secondary formation of O_3 within the context of permitting a new stationary source 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."*

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

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 locations where maximum PM_{10} and $PM_{2.5}$ impacts are anticipated.

Emissions Rates Used in Impact Analyses

Table 6 lists the emissions rates used for specified averaging periods in the air impact modeling analyses. These rates must be representative of, or greater than, PTE as indicated by design capacity or as limited by an enforceable permit provision. ENGINE1 is the only existing source at the facility that was not included in the SIL analyses. The other sources at the site were operational prior to this proposed modification, but were not likely operating at full capacity. Rather than calculate the emissions increase associated with these sources, W&A conservatively modeled the full allowable emissions from these sources in the SIL analyses. All other sources included in the cumulative impact analyses were offsite sources, which included natural gas well sites and the nearby Langley Gulch Power Plant.

3.1.2 Toxic Air Pollutant Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 210 are only applicable to new or modified sources constructed after July 1, 1995. TAP compliance for the HWY 30 facility was demonstrated on a facility-wide basis.

Many of the TAP emissions sources at the HWY 30 facility are regulated under 40 CFR 60, 61, or 63. These sources are exempt from TAP rules as per Idaho Air Rules Section 210 and were excluded from the TAP modeling applicability calculation.

After excluding emissions from sources exempt from the TAPs rules, no project-wide emissions of any TAP exceeded the applicable emissions screening levels (ELs) of Idaho Air Rules Section 585 or Section 586. Consequently, air impact modeling analyses were not required to demonstrate that impacts of TAP emissions are below the applicable ambient increment standards expressed in Idaho Air Rules Section 585 and 586.

Table 6. EMISSIONS RATES USED IN IMPACT MODELING ANALYSES						
Source Modeled Identification Code	**Description**	**Emissions (pounds/hour)**				
		1-Hour NO_x	**Ann. NOx**	**24-Hour $PM_{2.5}$**	**Ann. $PM_{2.5}$**	**24-Hour PM_{10}**
ENGINE2	Caterpillar G398 HCR Engine	1.344	1.344	0.0924	0.0924	0.0924
ENGINE3	Caterpillar G3516B Engine	3.040	3.040	0.220	0.220	0.220
ENGINE4	Caterpillar G398 TA HCR Engine	0.447	0.447	0.031	0.031	0.031
RBLRHTR1	Reboiler Heater 1	0.061	0.061	0.0035	0.0035	0.0046
RBLRHTR2	Reboiler Heater 2	0.061	0.061	0.0035	0.0035	0.0046
STBL-HTR1	Stabilizer Heater 1	0.1220	0.1220	0.0070	0.0070	0.0093
STBL-HTR2	Stabilizer Heater 2	0.1220	0.1220	0.0070	0.0070	0.0093
ENG-HTR1	Engine Heater 1	0.0163	0.0163	9.00E-4	9.00E-4	0.0012
ENG-HTR2	Engine Heater 2	0.0163	0.0163	9.00E-4	9.00E-4	0.0012
CONDHTR1	Condensate Heater 1	0.1220	0.1220	0.0070	0.0070	0.0093
CONDHTR2	Condensate Heater 2	0.1220	0.1220	0.0070	0.0070	0.0093
FLR1	High Pressure Flare	0.4044	0.4044	0.0100	0.0100	0.0100
FLR2	Low Pressure Flare	0.6048	0.6048	0.0100	0.0100	0.0100
Co-Contributing Sources Included in the Model						
ENGINE1	Caterpillar G398 TA HCR	1.344	1.344	0.0924	0.0924	0.0924
LGTURBINE	Turbine Stack[a]	452.8	452.8	12.55	12.55	12.55
COOLTOWER	Cooling Tower[a]			0.81	0.81	0.81
SILO1	Silo 1[a]			0.13	0.13	0.13
SILO2	Silo 2[a]			0.13	0.13	0.13
SILO3	Silo 3[a]			0.13	0.13	0.13
KAU19ENG1	Engine[b]	1.344	1.344	0.0924	0.0924	0.0924
KAU19WHHTR1	Well Head Heater[b]	0.00410	0.00410	0.00020	0.00020	0.00020
KAU19LNHTR1	Line Heater[b]	0.0407	0.0407	0.0023	0.0023	0.0023
KAU19HTRTR1	Heater Treater[b]	0.0813	0.0813	0.0046	0.0046	0.0062
KAU19FLR1	Flare[b]	0.3537	0.3537	0.0052	0.0052	0.0052
KAU134ENG1	Engine[b]	1.344	1.344	0.0924	0.0924	0.0924
KAU134WHHTR1	Well Head Heater[b]	0.00410	0.00410	0.00020	0.00020	0.00020
KAU134LNHTR1	Line Heater[b]	0.0407	0.0407	0.0023	0.0023	0.0023
KAU134HTRTR1	Heater Treater[b]	0.0813	0.0813	0.0046	0.0046	0.0062
KAU134FLR1	Flare[b]	0.3537	0.3537	0.0052	0.0052	0.0052
ML13ENG1	Engine[b]	1.344	1.344	0.0924	0.0924	0.0924
ML13WHHTR1	Well Head Heater[b]	0.00410	0.00410	0.00020	0.00020	0.00020
ML13LNHTR1	Line Heater[b]	0.0407	0.0407	0.0023	0.0023	0.0023
ML13HTRTR1	Heater Treater[b]	0.0813	0.0813	0.0046	0.0046	0.0062
ML13FLR1	Flare[b]	0.3537	0.3537	0.0052	0.0052	0.0052
ML23ENG1	Engine[b]	1.344	1.344	0.0924	0.0924	0.0924
ML23WHHTR1	Well Head Heater[b]	0.00410	0.00410	0.00020	0.00020	0.00020
ML23LNHTR1	Line Heater[b]	0.0407	0.0407	0.0023	0.0023	0.0023
ML23HTRTR1	Heater Treater[b]	0.0813	0.0813	0.0046	0.0046	0.0062
ML23FLR1	Flare[b]	0.3537	0.3537	0.0052	0.0052	0.0052

a. Sources at the Langley Gulch Power Plant.
b. Sources at surrounding well sites.

3.1.3 Emissions Release Parameters

Table 7 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for emissions sources modeled in the air impact analyses.

W&A provided detailed documentation and justification of emissions release parameters within the *Air Impact Modeling Analyses Report* (Section 4.3), submitted as part of the application on June 13, 2017. Parameters represent best or conservative design information or best estimates of parameters at the time of permit application submittal. DEQ performed sensitivity analyses to assure NAAQS compliance if certain release parameters (those DEQ was not confident that conservative values were used in the submitted analyses) are different from what was used in the submitted analyses and are not as favorable for pollutant dispersion. The parameters used in the sensitivity analyses are described below and in Table 7.

If release parameters of operating sources are substantially different from what was used in the air impact analyses (including DEQ sensitivity analyses), such that modeled parameters no longer conservatively represent emissions sources, then these air impact analyses may be effectively invalidated and will not satisfy the requirements of Idaho Air Rules Section 203.02 and 203.03. Substantial changes from what was submitted in the application or used in the DEQ verification/sensitivity analyses would include: 1) a decrease in stack height by more than about 10 percent; 2) a decrease in stack gas flow temperature by more than about 20 percent; 3) a change in source location by more than 10 meters, especially if closer to an ambient air boundary or closer to the design value receptor location; 4) construction of buildings near emissions sources that could increase plume downwash.

Engine Release Parameters

DEQ recommended that W&A estimate stack parameters for engines using methods provided in the Washington State Department of Ecology (WA Ecology) document, *Suitability of Diesel-Powered Emergency Generators for Air Quality General Order of Approval: Evaluation of Control Technology, Ambient Impacts, and Potential Approval Criteria,* published in June 2006. The engine exhaust flow was based on the horsepower (hp) rating of the engine (for example, ENGINE1 and ENGINE2 had a rating of 610 hp) by the following equation from the guidance:

$$\frac{0.284\ (m^3/sec)}{100\ (hp)} \Big| \frac{EngHP\ (hp)}{} = ExhFlow\ (m^3/sec)$$

where:

EngHP	=	power rating of the engine (horsepower)
ExhFlow	=	calculated exhaust flow (meters^3/second)

The guidance recommends using a 44.6 meter/second stack gas exit velocity and then calculating the diameter that would result in a total flow equal to the exhaust flow calculated by the equation above. W&A used flow velocities based on actual stack diameters of installed equipment. This is a more accurate refinement of the method than that proposed in the WA Ecology guidance.

A lower exhaust flow velocity could result in increased modeled impacts. Higher exhaust exit velocity results in a higher plume momentum flux, which results in higher plume rise and lower estimated ground-level impacts. DEQ performed a sensitivity analysis using an exhaust flow of 80 percent of that indicated by the WA Ecology method and a lower exhaust temperature of 600 K for all engines.

W&A estimated exhaust temperatures using a table in the WA Ecology's guidance that lists exit gas temperatures for various power ratings of engines, interpolating between the values listed in the table.

Table 7. POINT SOURCE STACK PARAMETERS USED INIMPACT MODELING ANALYSES							
Release Point	Description	UTM[a] Coordinates		Stack Height (m)	Stack Gas Flow Temp. (K)[c]	Stack Flow Velocity (m/sec)[d]	Stack Dia. (m)
		Easting (m)[b]	Northing (m)				
ENGINE2	Caterpillar G398 HCR	514900	4862693	6.6	901 (650)[e]	23.7 (19.0)[e]	0.30
ENGINE3	Caterpillar G3516B Engine	514797	4862739	6.6	925 (650)[e]	53.7 (43.0)[e]	0.30
ENGINE4	Caterpillar G398 TA HCR	514919	4862668	6.6	736 (650)[e]	7.9 (6.3)[e]	0.30
RBLRHTR1	Reboiler Heater 1	514906	4862649	5.9	300 (422)[e]	22.2 (6.7)[e]	0.152
RBLRHTR2	Reboiler Heater 2	514798	4862712	6.1	300 (422)[e]	22.2 (6.7)[e]	0.152
STBL-HTR1	Stabilizer Heater 1	514902	4862648	6.5	300 (422)[e]	22.2 (13.4)[e]	0.152
STBL-HTR2	Stabilizer Heater 2	514795	4862698	6.5	300 (422)[e]	22.2 (13.4)[e]	0.152
ENG-HTR1	Engine Heater 1	514890	4862652	3.7	300 (422)[e]	22.2 (1.79)[e]	0.152
ENG-HTR2	Engine Heater 2	514794	4862692	3.7	300 (422)[e]	22.2 (1.79)[e]	0.152
CONDHTR1	Condensate Heater 1	514892	4862652	4.6	300 (422)[e]	22.2 (13.4)[e]	0.152
CONDHTR2	Condensate Heater 2	514795	4862686	4.6	300 (422)[e]	22.2 (13.4)[e]	0.152
FLR1	High Pressure Flare	514857	4862645	8.4	1273	20	0.57 (0.30)[e]
FLR2	Low Pressure Flare	514857	4862645	8.4	1273	20	0.68 (0.37)[e]
Co-Contributing Sources Included in the Model							
ENGINE1	Caterpillar G398 TA HCR	514899	4862675	6.6	901 (650)[e]	23.7 (19.0)[e]	0.30
LGTURBINE	Turbine Stack	514471	4861261	48.8	363	17.5	5.5
COOLTOWER	Cooling Tower	514400	4861189	14.2	298	10.0	10
SILO1	Silo 1	514425	4861210	19.9	311	1.6	0.61
SILO2	Silo 2	514420	4861215	12.6	311	1.6	0.61
SILO3	Silo 3	514415	4861219	13.6	311	1.6	0.61
KAU19ENG1	Engine	514648	4877759	6.1	901	53.4	0.20
KAU19WHHTR1	Well Head Heater	514618	4877774	3.7	422	22.3	0.152
KAU19LNHTR1	Line Heater	514627	4877770	3.7	422	22.3	0.152
KAU19HTRTR1	Heater Treater	514638	4877764	3.7	422	22.3	0.152
KAU19FLR1	Flare	514647	4877830	6.1	1273	20	0.68
KAU134ENG1	Engine	515130	4880722	6.1	901	53.4	0.20
KAU134WHHTR1	Well Head Heater	515160	4880738	3.7	422	22.3	0.152
KAU134LNHTR1	Line Heater	515154	4880734	3.7	422	22.3	0.152
KAU134HTRTR1	Heater Treater	515144	4880728	3.7	422	22.3	0.152
KAU134FLR1	Flare	515147	4880665	6.1	1273	20	0.68
ML13ENG1	Engine	515645	4878848	6.1	901	53.4	0.20
ML13WHHTR1	Well Head Heater	515620	4878868	3.7	422	22.3	0.152
ML13LNHTR1	Line Heater	515625	4878864	3.7	422	22.3	0.152
ML13HTRTR1	Heater Treater	515634	4878857	3.7	422	22.3	0.152
ML13FLR1	Flare	515659	4878910	6.1	1273	20	0.68
ML23ENG1	Engine	515489	4878635	6.1	901	53.4	0.20
ML23WHHTR1	Well Head Heater	515480	4878665	3.7	422	22.3	0.152
ML23LNHTR1	Line Heater	515482	4878659	3.7	422	22.3	0.152
ML23HTRTR1	Heater Treater	515485	4878649	3.7	422	22.3	0.152
ML23FLR1	Flare	515554	4878660	6.1	1273	20	0.68

a. Universal Transverse Mercator.
b. Meters.
c. Kelvin
d. Meters/second. All sources release uninterrupted in the vertical direction (not horizontal or rain capped releases).
e. Values and parentheses are those used in DEQ verification/sensitivity analyses where such values are different from those used in the analyses submitted with the application.

Flare Release Parameters

Modeling impacts from an open flame flare presents challenges because the appropriate method for estimating stack release parameters is not readily evident for point source model inputs of stack diameter, stack gas exist velocity, and stack gas exit temperature. Various methods have been developed to

calculate appropriate release parameter values for flares, all primarily involving the heat input of the gas stream flared and the radiative heat loss. W&A used a method specified by the Texas Commission on Environmental Quality (TCEQ). The application provided a copy of the TCEQ guidance for using the method and a description of the technical basis for the approach.

The TCEQ methods for calculating model input parameters for a flare are very similar to those used in the EPA screening model SCREEN3 for flares, as described in the SCREEN3 User's Guide[3]. The method sets the exit gas velocity and temperature constant at 20 meters/second and 1,273 Kelvin, respectively. The stack diameter is then calculated based on the heat released from the combustion of gases in the flare by the following equation:

$$D = [(q_n)(10^{-6})]^{1/2}$$
$$q_n = q[1 - 0.048(MW)^{1/2}]$$

where:

D = effective stack diameter (meters)
q = gross heat released (calories/second)
q_n = net heat released (calories/second)
MW = weighted average molecular weight of gas flared

The gross heat release of 4.17 E5 calories/second for the high-pressure flare and 6.23 E5 calories/second for the low-pressure flare were provided by W&A and were based on the molecular composition of the flared gas, expressed as mole/day of specific compounds. The weighted average molecular weight (20.35 for the high-pressure flare and 31.38 for the low-pressure flare) was calculated based on the mole fraction of specific compounds in the flared gas and the molecular weight of those compounds. The net heat released was then calculated at 3.26 E5 calories/second for the high-pressure flare and 4.55 E5 calories/second for the low-pressure flare, giving an effective diameter of 0.57 meters for the high-pressure flare and 0.68 meters for the low-pressure flare.

Provided the composition of the flared gas is accurate or conservative for the source, DEQ asserts that the TCEQ method is appropriate for estimating model input parameters for the flare. To provide additional assurance, DEQ performed sensitivity analyses using the SCREEN3 method. DEQ also adjusted input parameters of the SCREEN3 method to represent a more conservative assessment. These adjustments included the following:

- Not accounting for additional release height per a calculation of "length of flame" of the operating flare.
- Calculating the effective diameter (which affects the buoyancy flux of the emitted plume) using a value of half that of q_n.

In the SCREEN3 method, the net heat released is calculated by:

$$q_n = (0.45)q$$

where:

q = gross heat released (calories/second)
q_n = net heat released (calories/second)

The effective diameter is then calculated by $D = 9.88E\text{-}4(q_n)^{0.5}$.

Using a gross heat release (q) of 4.17 E5 calories/second for the high-pressure flare and 6.23 E5 calories/second for the low-pressure flare results in a net heat release (q_n) of 1.88 E5 calories/second for the high-pressure flare and 2.80 E5 calories/second for the low-pressure flare. The effective diameter (D) was then calculated at 0.43 meters for the high-pressure flare and 0.52 meters for the low-pressure flare. DEQ used an additional measure of conservatism by recalculating the effective diameter (D) by assuming only half the net heat release, giving a value of D = 0.30 meters for the high-pressure flare and 0.37 meters for the low-pressure flare.

The SCREEN3 method directs the use of a stack gas release velocity of 20 meters/second and a stack gas temperature of 1,273 Kelvin, identical to that used for the TCEQ method.

The stack height used for a flare release for the SCREEN3 method can be increased from the physical height of the flare to account for the flame length according to the following equation:

$$Ha = Hs + [(4.56E\text{-}3)(q^{0.478})]$$

where:

Ha = effective stack height (meters)
Hs = physical height of flare (meters)
q = gross heat release (calories/second)

DEQ's sensitivity analyses did not account for an increased release height, adding an additional level of conservatism to the results.

Process Heater Release Parameters

Release parameters for various process heaters were estimated by W&A using a Utah Department of Environmental Quality generic approach for modeling heaters at natural gas well sites, as described in the submitted application. The approached used parameters associated with a 3.0 million British thermal unit/hour (mmBtu/hour) heater, which was estimated to produce an exhaust flow of 860 actual cubic feet/minute (acfm) at 600° F, resulting in a 22.2 meter/second exit velocity, given a design specified stack diameter at the exit of 0.5 feet (0.152 meters). As a conservative measure, W&A modeled the sources with an exhaust temperature of 300 K (80° F) rather than 600° F, reducing the effect of plume rise from thermal buoyancy.

The heater units at the HWY 30 facility are substantially less than 3 MMBtu/hour, so calculated flows for a 3 mmBtu/hour heater likely overpredict flows for smaller units. The stabilizer and condensate heaters are 1.5 mmBtu/hour, the reboilers are 0.75 mmBtu/hour, and the engine heaters are 0.2 mmBtu/hour. Use of an 860 acfm flow for heaters in the submitted analyses is not conservative, although this is offset by use of very low exhaust temperatures, which will substantially reduce any plume rise from thermal buoyancy. Additionally, the emissions rates of lower heat-input units are very small and will not likely affect modeled design values. DEQ performed combustion evaluations for 1.5, 0.75, and 0.2 mmBtu/hour units to evaluate flow rates for a DEQ verification/sensitivity analysis. DEQ used an exhaust temperature of 300° F (422 K) as a less conservative measure, although DEQ asserts that 300° F is likely still lower than actual operating conditions. A flow of about 500 acfm at a temperature of 300° F was predicted for the 1.5 MMBtu/hour units, a flow of 260 acfm was predicted for 0.75 MMBtu/hr units, and a flow of about 70 acfm was predicted for the 0.2 MMBtu/hour units. These values were used with the given stack diameters to generate the values for exhaust flow velocity in Table 7.

3.2 *Background Concentrations*

Background concentrations are used if a cumulative NAAQS air impact modeling analysis is needed to demonstrate compliance with applicable NAAQS. DEQ previously provided W&A with appropriate background concentrations for 1-hour and annual averaged NO_2 for well site projects in the area.

Background concentrations were determined by DEQ using the following web-based design value concentration tool: Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST) Lookup 2009-2011 Design Values of Criteria Pollutants (http://lar.wsu.edu/nw-airquest/lookup.html). These design value air pollutant levels are based on regional scale air pollution modeling of Washington, Oregon, and Idaho, with values influenced by monitoring data as a function of distance from the monitor. Table 8 provides background concentrations used in the cumulative NAAQS analyses.

W&A used NO_2 background concentrations provided by DEQ for the Kauffman 1-9 Well Site Facility for this HWY 30 project. These concentrations are slightly lower than the NW AIRQUEST value obtained for the location of the HWY 30 project, as shown in Table 8. Final approval was based on using the higher NO_2 background concentration values.

Table 8. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	71
$PM_{2.5}$[c]	24-hour	17
	Annual	6.3
Nitrogen dioxide (NO_2)	1-hour	52.6[d] (58.3)[e]
	Annual	4.7[d] (4.9)[e]

a. Micrograms per cubic meter.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
d. Value used in submitted analysis. This value was provided to W&A for the Kauffman 1-9 Well Site Facility and was based on the NW AIRQUEST tool for that site.
e. Value obtained from the NW AIRQUEST tool by DEQ for the HWY 30 site.

3.3 *NAAQS Impact Modeling Methodology*

This section describes the modeling methods used by the applicant's consultant and DEQ to demonstrate preconstruction compliance with applicable air quality standards.

3.3.1 *General Overview of Impact Analyses*

W&A performed the project-specific air pollutant emissions inventory and air impact analyses that were submitted with the application. Results of the submitted information/analyses, in combination with DEQ's verification and sensitivity 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.

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	Payette, Idaho	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 16216r.
Meteorological Data	Langley Gulch site data, Ontario, OR, surface data, Boise upper air data	December 2008 - November 2009. See Section 3.3.5 of this memorandum for additional details of the meteorological data.
Terrain	Considered	USGS National Elevation Dataset (NED) files to establish elevations of ground level receptors. AERMAP was used to determine each receptor elevation and hill height scale.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility. BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD.
Receptor Grid	Grid 1	10-meter spacing along the property boundary out to about 100 meters
	Grid 2	25-meter spacing out to 500 meters.
	Grid 3	100-meter spacing out to 5,000 meters.
	Grid 4	200-meter spacing out to 20,000 meters.

3.3.2 Modeling protocol and Methodology

A modeling protocol, describing data and methods proposed for the project, was not initially submitted to DEQ. W&A corresponded with DEQ on modeling methods and data for well site projects that were recently permitted in the area, and methods and data used for these projects were very similar to those used for the HWY 30 project. Final project-specific modeling and other required impact analyses were generally conducted using data and methods as discussed with DEQ and as described in the *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 16216r was used by W&A for the modeling analyses to evaluate air pollutant impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.4 NO_2 Chemistry

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 by using several methods as outlined in a 2014 EPA NO_2 Modeling Clarification Memorandum[4]. 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).

W&A used the Tier 2 Ambient Ratio Method 2 (ARM2) to conservatively account for NO/NO_2 chemistry. A minimum and maximum NO_2/NOx ratio of 0.5 and 0.9 were specified in the model, respectively. ARM2 is a regulatory option within the AEMROD model and DEQ accepted its use on that basis. This method is likely very conservative for estimating NO_2 impacts for the HWY 30 facility because: 1) NO_2:NOx in-stack ratios are likely quite low (less than 0.2), and the default used assumes a minimum ambient ration of 0.5; 2) O_3 levels (O_3 reacts with NO to form NO_2) are relatively low in the area during most times.

3.3.5 Meteorological Data

DEQ provided W&A with model-ready meteorological data, using one year of data from a station at the Langley Gulch Power plant, located along Interstate Highway 84, south of New Plymouth. The Langley Gulch site is about 1,500 meters south of the HWY 30 site. Onsite data collected included wind speed, wind direction, delta temperature, and solar radiation. These data were supplemented with National Weather Service (NWS) surface data from the Ontario, Oregon, site KONO, including one-minute ASOS data. Upper air data were obtained from the NWS site in Boise, Idaho.

DEQ processed the December 2008 through November 2009 Langley Gulch meteorological data using AERMET Version 15181, AERMINUTE Version 15271, and AERSURFACE 13016.

DEQ determined that meteorological data from the Langley Gulch site were more representative of conditions at the HWY 30 site than data collected at the Boise Airport. This is because the Langley Gulch data collection site is much closer than the Boise airport site and surface characteristics of the Langley Gulch site more closely match those of the HWY 30 site than the Boise airport site.

3.3.6 Effects of Terrain on Modeled Impacts

Submitted ambient air impact analyses used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files in the WGS84 datum (approximately equal to the NAD83 datum).

The terrain preprocessor AERMAP Version 11103 was used by W&A 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 emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain.

3.3.7 Facility Layout

DEQ verified proper identification of the site location, equipment locations, and the ambient air boundary by comparing a graphical representation of the modeling input file to plot plans submitted in the application. Aerial photographs of the site on Google Earth (available at https://www.google.com/earth) were also used to assure that horizontal coordinates were accurate as described in the application and as used in the model input files.

3.3.8 Effects of Building Downwash on Modeled Impacts

Potential downwash effects on emissions plumes were accounted for in the model by using building dimensions and locations (locations of building corners, base elevation, and building heights). Dimensions and orientation of proposed buildings were used as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME) to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information for input to AERMOD. The addition of any other structures at the site could cause increased plume downwash and potentially invalidate the analyses described in this memorandum for NAAQS compliance demonstration purposes.

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 was considered areas external to the fence enclosing the HWY 30 facility. DEQ has determined that measures described in the application to preclude public access to areas of the site excluded from ambient air are adequate.

3.3.10 Receptor Network

Table 9 describes the receptor grid used in the submitted analyses. The receptor grid used in the submitted analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[2] and DEQ determined that it was adequate to resolve maximum modeled impacts. A receptor grid extending out beyond 20,000 meters from the facility boundary was used to assure that maximum potential impacts were identified.

3.3.11 Good Engineering Practice Stack Height

An allowable good engineering practice (GEP) stack height may be established using the following equation in accordance with Idaho Air Rules Section 512.03.b:

$H = S + 1.5L$, where:

H = good engineering practice stack height measured from the ground-level elevation at the base of the stack.

S = height of the nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension, height or projected width, of the nearby structure.

All HWY 30 sources are below GEP stack height. Therefore, it is important to account for plume downwash caused by structures at the facility.

3.3.12 Neighboring Co-Contributing Emissions Sources

Given the magnitude of emissions quantities of the proposed project and the low release height, maximum impacts are anticipated to occur within 100 meters of the emissions sources, with impacts rapidly decreasing beyond this point. However, there are some neighboring co-contributing sources that could affect pollutant concentrations and were not adequately accounted for by background concentration

values. The largest co-contributing emissions source is the Langley Gulch Power Plant, located about 1,400 meters south of the HWY 30 facility. There are also numerous natural gas well sites in the area, each with relatively small emissions of criteria pollutants. Although DEQ determined the well sites were too distant and had insufficient emissions quantities to measurably contribute to the HWY 30 cumulative NAAQS impact analyses, these facilities were included in the submitted NAAQS analyses as a conservative measure. The Langley Gulch Power Plant was also included in the cumulative NAAQS impact analyses for the HWY 30 facility.

4.0 NAAQS Impact Modeling Results

4.1 Results for the SIL Analyses

Table 10 provides results for the SIL analyses. Modeled impacts exceeded applicable SILs for all pollutants requiring a NAAQS compliance demonstration. Figure 1 provides a contour plot of maximum 1-hour NO_2 impacts from the proposed modification, and Figure 2 provides that plot for the immediate area surrounding the facility.

Table 10. RESULTS FOR SUBMITTED SIL ANALYSES

Pollutant	Averaging Period	Maximum Impact ($\mu g/m^3$)[a]	SIL[b] ($\mu g/m^3$)	Radius of Impact Distance (meters)	Cumulative NAAQS Analysis Required
$PM_{2.5}$	24-hour	5.5	1.2	336	Yes
	Annual	0.7	0.3	256	Yes
PM_{10}	24-hour	5.6	5	160	Yes
NO_2	1-hour	108.4	7.5	20,174	Yes
	Annual	3.6	4.7	642	Yes

a. micrograms per cubic meter.
b. Significant Impact Level.

4.2 Results for Cumulative NAAQS Analyses

4.1.1 Submitted Analyses

Cumulative 1-hour and annual NO_2, 24-hour and annual $PM_{2.5}$, and 24-hour PM_{10} NAAQS analyses were performed for the HWY 30 facility. Results of the impact analyses are provided in Table 11. Figure 3 shows 1-hour NO_2 impact contours in the immediate vicinity of the facility.

4.1.2 DEQ Sensitivity and Verification Analyses

DEQ performed both verification analyses and sensitivity analyses of impacts associated with operation of the HWY 30 facility. Verification analyses assured that model output results, given the specified input parameters, are accurate and reproducible. Sensitivity analyses are performed to evaluate how sensitive model results are to changes in the input parameters, such as source exhaust flow rates, exhaust temperatures, etc.

Figure 1: 1-hour NO_2 impacts for the SIL analysis for the modeling domain.

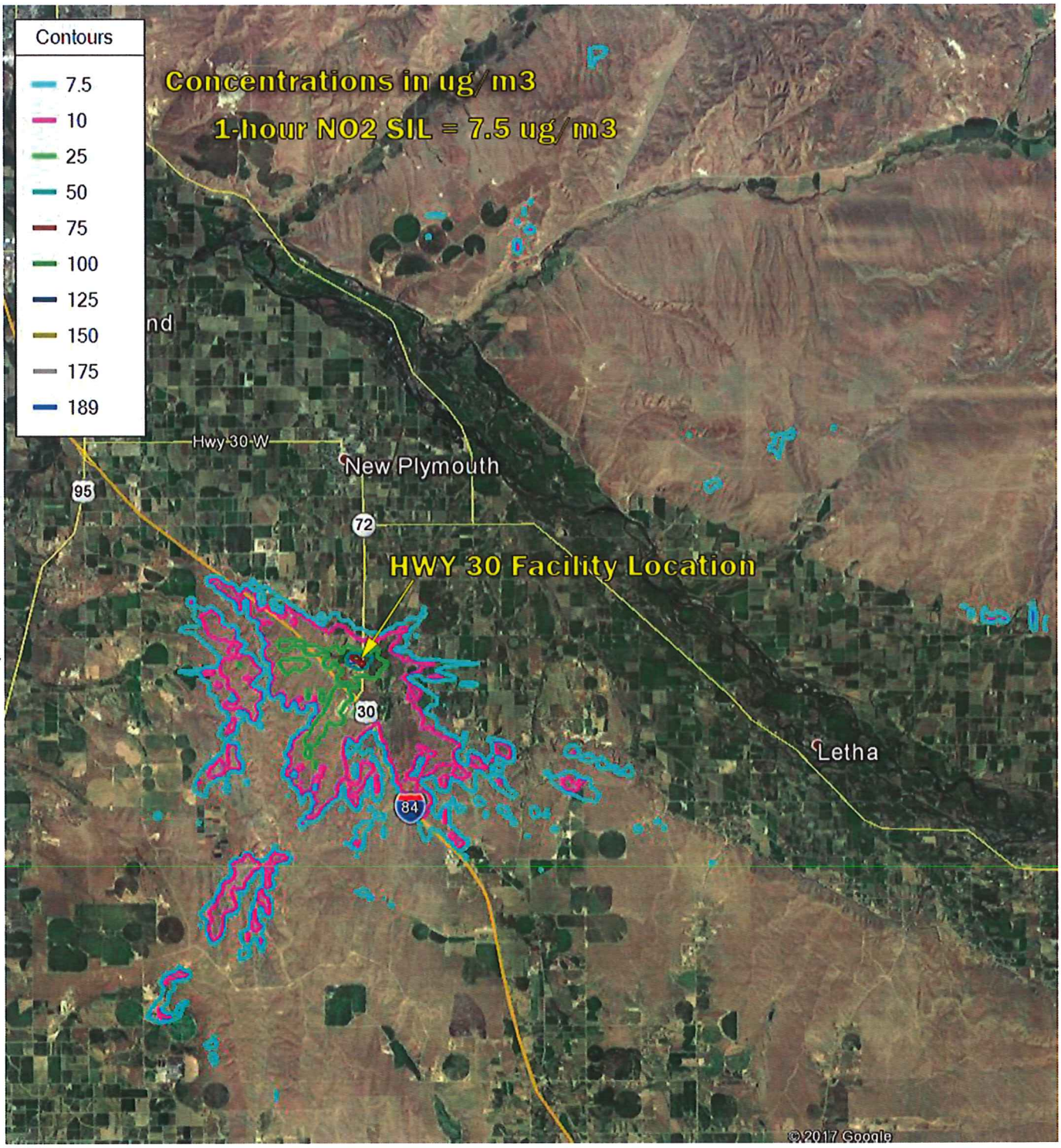

Figure 2: 1-hour NO_2 impacts for the SIL analysis for the immediate area surrounding the HWY 30 facility.

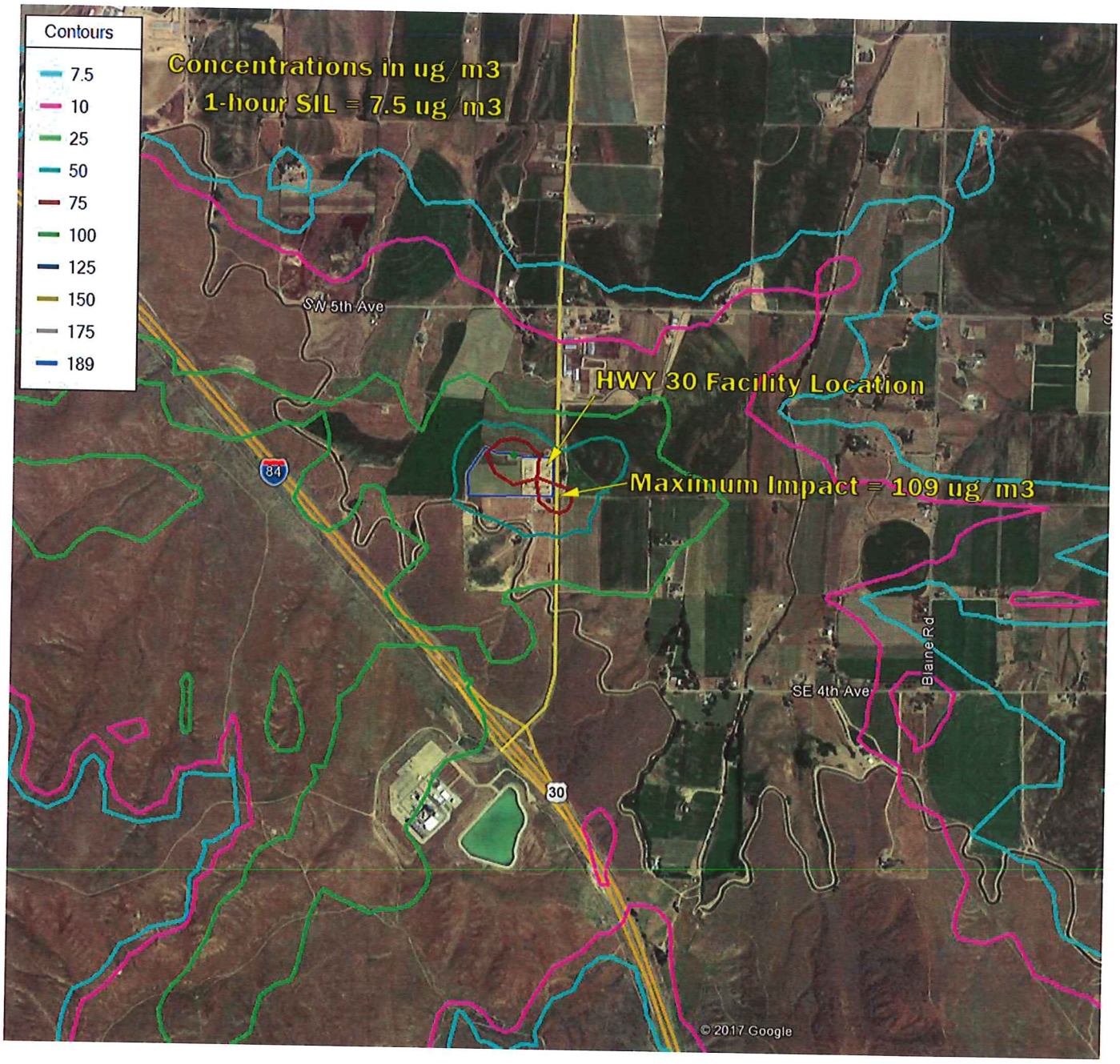

Figure 3: 1-hour NO_2 impacts for the cumulative NAAQS analysis for the immediate area surrounding the HWY 30 facility.

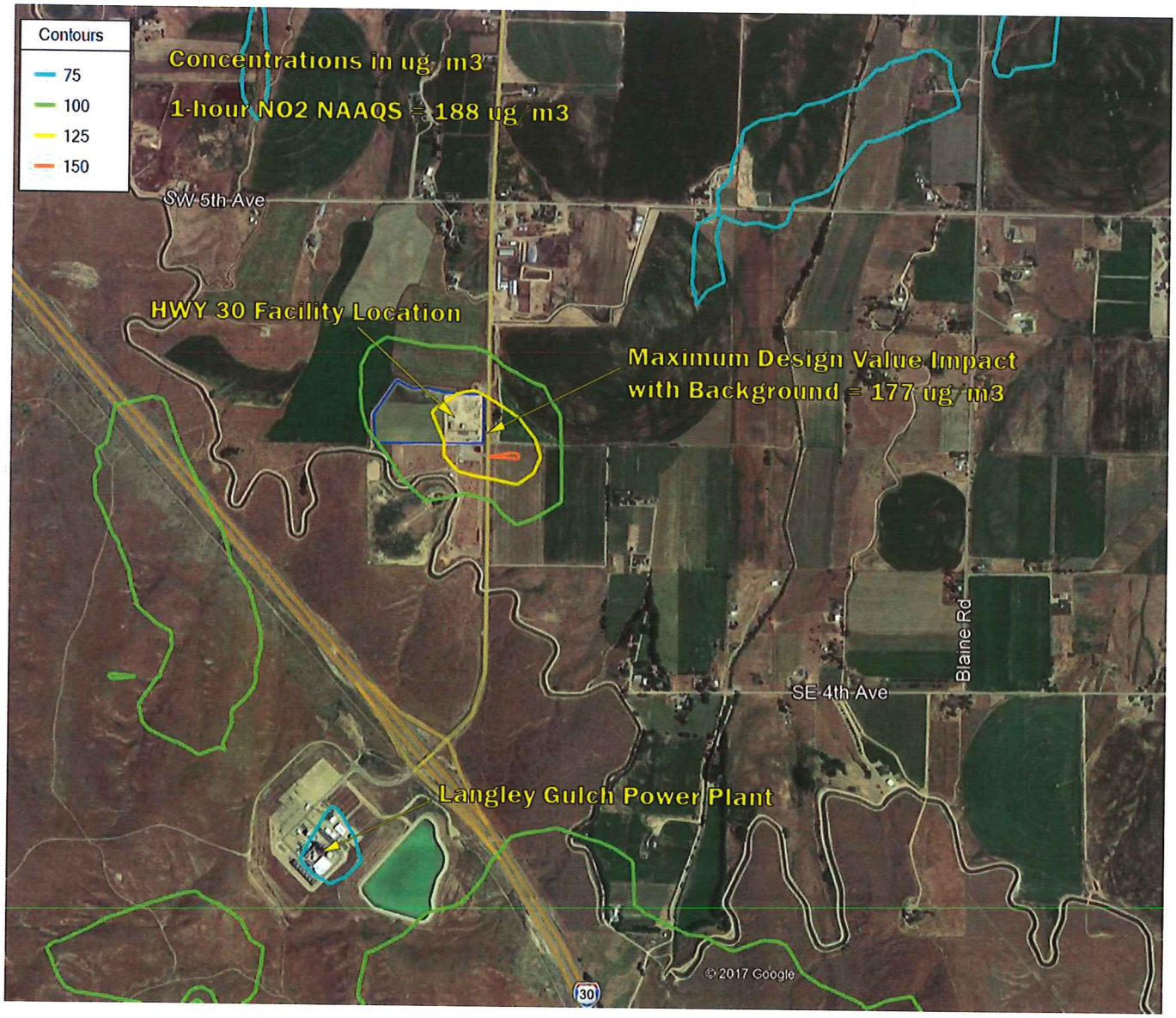

Table 11. RESULTS FOR SUBMITTED AIR IMPACT ANALYSES						
Pollutant	**Averaging Period**	**Modeled Design Value Impact ($\mu g/m^3$)[a]**	**Background Value ($\mu g/m^3$)**	**Total Maximum Concentration ($\mu g/m^3$)**	**NAAQS[b] ($\mu g/m^3$)**	**Percent of NAAQS**
$PM_{2.5}$	24-hour	4.0	17.0	21.0	35	60
	Annual	1.0	6.3	7.3	12	61
PM_{10}	24-hour	3.2	94.0 (71)	97.2 (74.2)	150	65 (49)
NO_2	1-hour	119.0	52.6 (58.3)	171.6 (177.3)	188	91 (94)
	Annual	14.2	4.7	18.9	100	19

a. micrograms per cubic meter.
b. National Ambient Air Quality Standard

Table 12 summarizes the changes made in the DEQ verification/sensitivity analysis from those used in the submitted analyses. DEQ's analysis was performed for the cumulative NAAQS 1-hour NO_2 impacts. DEQ used the same receptor grid as was used for the submitted cumulative NAAQS impact analyses, which was based on those receptors where the SIL analysis indicated there was a significant impact.

Table 12. CHANGES MADE TO SUBMITTED ANALYSES FOR DEQ VERIFICATION/SENSITIVITY ANALYSES		
Emissions Source(s)	**Parameter**	**Description of Changes**
Engines	Stack Flow	The submitted analyses used a WA Ecology method for modeling parameters of engines, varying the flow by the rated capacity of the engine. DEQ conservatively assumed that flows could be only 80 percent of this value.
	Exhaust Temperatures	Engine exhaust temperatures in the submitted analyses were based on a table in the documentation for the WA Ecology method for modeling parameters of engines. Exhaust temperatures for the three largest engines ranged from 736 K to 925 K (865-1206° F). As a conservative measure, DEQ sensitivity analyses used an exhaust temperature of 650 K (710° F) for all engines.
Various Heaters	Stack Flow Velocity	The submitted analyses assumed an exhaust flow rate equal to a 3 mmBtu/hour unit. The heater units used at the HWY 30 site were substantially less and will have lower flow rates and flow velocities. DEQ recalculated flows from combustion at the rated capacity of the units. Adjusted flow rates are shown in Table 7.
	Exhaust Temperatures	The application indicated that the Utah method for heaters in use at nature gas well sites directed using a value of 600° F, which DEQ suspected could be too high. In response, W&A performed analyses using a heater exhaust temperature of 300 K (81° F). DEQ determined 300 K is overly conservative, and adjusted the temperature to 422 K (300° F). This will somewhat offset the DEQ adjustment of stack flow for these sources.
Flares	Stack Diameter	The fare technique used in the submitted application established a diameter as a function of gross heat released and molecular weight of the compounds flared. As a conservative measure, DEQ calculated the diameter based on the SCREEN3 method and a gross heat released value of half that indicated in the application.

The stack parameter sensitivity analyses for 1-hour NO_2 resulted in a design value impact of 128.6 $\mu g/m^3$. A total impact of 186.9 $\mu g/m^3$ was generated when the 58.3 $\mu g/m^3$ background value was added to the modeled result. The engines themselves have a design value impact of 126 $\mu g/m^3$, although not at the same receptor location. The flares have a design value impact of 33 $\mu g/m^3$ and the heaters have an impact of 48 $\mu g/m^3$. Well sites in the area only have an impact of less than 1 $\mu g/m^3$ in an area within 100 meters of the HWY 30 facility and the Langley Gulch Power Plant design value impact is less than 27 $\mu g/m^3$. Although combined design value modeled impact (with background) is close to the 188 $\mu g/m^3$ 1-hour NO_2 NAAQS, DEQ is highly confident that operation of the proposed modification or operation of the entire facility will not cause or significantly contribute to a violation of the NAAQS because of the following:

- Emissions estimates appear reasonably accurate and operational rates are conservative, assuming continual operation.

- Release parameters used in the DEQ analyses are likely conservative, resulting in overestimation of impacts from the modeled emissions sources.

- The air impact analyses assume that design value modeled impacts and design value background concentrations will occur simultaneously. This is very unlikely. Because of the statistical form of the 1-hour NO_2 standard, it is unlikely that two unrelated rare events will occur simultaneously and with a frequency that will affect the design value. Modeled daily maximum 1-hour impacts decrease substantially with decreased ranking from the 8th high of the design value. The maximum 25th high modeled impact (with the 58.3 $\mu g/m^3$ background) was 183 $\mu g/m^3$ and the maximum 100th high (of 365 total modeled days) was only 170 $\mu g/m^3$.

- NO to NO_2 conversion was addressed conservatively in the analyses. W&A used the ARM2 method with a default minimum ratio of 0.5. ARM2 is a Tier 2 method which generally predicts higher impacts than more refined Tier 3 methods, such as the Plume Volume Molar Ratio Method (PVMRM) or the Ozone Limiting Method (OLM). Also, internal combustion engine exhaust typically has NO:NOx ratios of 0.2, well below the 0.5 default value.

4.2 *Results for TAPs Impact Analyses*

Site-specific TAP impact analyses were not required for the HWY 30 facility because applicable facility-wide emissions of all TAPs are below ELs.

5.0 Conclusions

The information submitted with the PTC application, combined with DEQ air impact verification analyses, demonstrated to DEQ's satisfaction that emissions from the HWY 30 facility 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. *SCREEN3 Model User's Guide*. U.S. Environmental Protection Agency. Office of Air Quality Planning and Standards. Emission, Monitoring, and Analysis Division. Research Triangle Park, NC. EPA 454/B-95-004. September 1995.

4. *Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 National Ambient Air Quality Standard.* Office of Air Quality Planning and Standards. Air Quality Modeling Group. Research Triangle Park, NC. Guidance memorandum from R. Chris Owen and Roger Brode to Regional Dispersion Modeling Contacts. September 30, 2014.

APPENDIX C – FACILITY DRAFT COMMENTS

No comments were received from the facility on September 5, 2017.

APPENDIX D – PROCESSING FEE

PTC Prcessing 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: Northwest Gas Processing, LLC
Address: 4303 Highway 30 South
City: New Plymouth
State: ID
Zip Code: 83661
Facility Contact: Jennie Kent
Title: Facilities Engineer
AIRS No.: 075-00021

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

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	26.2	0	26.2
SO_2	0.1	0	0.1
CO	43.7	0	43.7
PM10	1.8	0	1.8
VOC	36.4	0	36.4
TAPS/HAPS	7.8	0	7.8
Total:	0.0	0	**116.0**
Fee Due	**$ 7,500.00**		

Comments: