



Williams Ohio Valley Midstream LLC
Park Place Corporate Center 2
2000 Commerce Drive
Pittsburgh, PA 15275
(412) 787-7300
(412) 787-6002 fax

December 9, 2014
(Via Federal Express)

William "Fred" Durham
Director - Division of Air Quality
West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304-2345

Subject: Application for Title V Operating Permit (45CSR30)
Williams Ohio Valley Midstream LLC
FORT BEELER GAS PROCESSING PLANT

Dear Mr. Durham,

Williams Ohio Valley Midstream LLC is submitting this Application for a Title V Operating Permit in accordance with the West Virginia Air Control Act and Title 45 Series 30 (45CSR30) for the Fort Beeler Gas Processing Plant in Marshall County.

The OVM Fort Beeler Gas Plant is currently operating under West Virginia Department of Environmental Protection (WVDEP) Regulation 13 Permit No. R13-2826H, dated 12/03/14. Note the Groves triethylene glycol dehydrator and associated equipment, located adjacent to the Fort Beeler Gas Plant, is covered under the enclosed Title V Operating Permit application. The conditions for the Groves dehydrator and associated equipment are based on draft Permit No. R13-3212, which is currently under public comment.

If you have any questions concerning this submittal or need additional information, please contact me at (412) 787-4259 or Danell.Zawaski@Williams.com.

Sincerely,

A handwritten signature in blue ink that reads "Danell Zawaski". The signature is fluid and cursive, with a long horizontal stroke extending from the start of the name.

R. Danell Zawaski, PE
Environmental Specialist

Enclosures:

Application for Title V Operating Permit (45CSR30) – Checklist
Application for Title V Operating Permit (45CSR30) – General Forms
Attachments A thru H
Supplements 01 thru 07

TITLE V PERMIT APPLICATION CHECKLIST FOR ADMINISTRATIVE COMPLETENESS

A complete application is demonstrated when all of the information required below is properly prepared, completed and attached. The items listed below are required information which must be submitted with a Title V permit application. Any submittal will be considered incomplete if the required information is not included.*

<input checked="" type="checkbox"/>	Two signed copies of the application (at least one <u>must</u> contain the original “ <i>Certification</i> ” page signed and dated in blue ink) (GENERAL FORM NO. 28)
<input checked="" type="checkbox"/>	Correct number of copies of the application on separate CDs or diskettes, (i.e. at least one disc per copy) (TWO CD-ROMs, EACH WITH ONE COPY OF PERMIT APPLICATION)
<input checked="" type="checkbox"/>	*Table of Contents (needs to be included but not for administrative completeness)
<input checked="" type="checkbox"/>	Facility information (GENERAL FORM NO. 12)
<input checked="" type="checkbox"/>	Description of process and products, including NAICS and SIC codes, and including alternative operating scenarios (GENERAL FORM NO. 14 AND ADDENDUM 01)
<input checked="" type="checkbox"/>	ATTACHMENT A - Area map showing plant location (ATTACHMENT A)
<input checked="" type="checkbox"/>	ATTACHMENT B - Plot plan showing buildings and process areas (ATTACHMENT B)
<input checked="" type="checkbox"/>	ATTACHMENT C - Process flow diagram(s), showing all emission units, control equipment, emission points, and their relationships (ATTACHMENT C)
<input checked="" type="checkbox"/>	Identification of all applicable requirements with a description of the compliance status (GENERAL FORM NO. 20, ATTACHMENT E, AND ADDENDUM 02) , the methods used for demonstrating compliance (GENERAL FORM NO. 20, ATTACHMENT E, AND ADDENDUM 03) , and a Schedule of Compliance Form (ATTACHMENT F-NA) for all requirements for which the source is not in compliance
<input checked="" type="checkbox"/>	Listing of all active permits and consent orders (if applicable) (GENERAL FORM NO. 21)
<input checked="" type="checkbox"/>	Facility-wide emissions summary (GENERAL FORM NO 23 AND ADDENDUM 03)
<input checked="" type="checkbox"/>	Identification of Insignificant Activities (GENERAL FORM NO. 24)
<input checked="" type="checkbox"/>	ATTACHMENT D - Title V Equipment Table (ATTACHMENT D) completed for all emission units at the facility except those designated as insignificant activities (GENERAL FORM NO. 24)
<input checked="" type="checkbox"/>	ATTACHMENT E - Emission Unit Form (ATTACHMENT E) completed for each emission unit listed in the Title V Equipment Table (ATTACHMENT D)
<input type="checkbox"/>	ATTACHMENT F - Schedule of Compliance Form (ATTACHMENT F-NA) for all requirements for which each emission unit is not in compliance (NOT APPLICABLE)
<input checked="" type="checkbox"/>	ATTACHMENT G - Air Pollution Control Device Form (ATTACHMENT G) completed for each control device listed in the Title V Equipment Table (ATTACHMENT D)
<input type="checkbox"/>	ATTACHMENT H - Compliance Assurance Monitoring (CAM) Form (NOT APPLICABLE) completed for each control device for which the “Is the device subject to CAM?” question is answered “Yes” on the Air Pollution Control Device Form (ATTACHMENT G)
<input checked="" type="checkbox"/>	General Application Forms signed by a Responsible Official (GENERAL FORM NO. 28)
<input type="checkbox"/>	Confidential Information submitted in accordance with 45CSR31 (NOT APPLICABLE)

**APPLICATION FOR
TITLE V OPERATING PERMIT (45CSR30)**

For the:

**Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
Marshall County, West Virginia**

Submitted to:



**WEST VIRGINIA
DIVISION OF AIR QUALITY
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

Submitted by:



**Williams Ohio Valley Midstream LLC
100 Teletech Drive, Suite 2
Moundsville, WV 26041**

Prepared by:



**EcoLogic Environmental Consultants, LLC
864 Windsor Court
Santa Barbara, CA 93111**

December 2014

**APPLICATION FOR
TITLE V OPERATING PERMIT (45CSR30)**

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
Marshall County, West Virginia

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TITLE V OPERATING PERMIT (45CSR30) APPLICATION

GENERAL FORMS

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**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL
PROTECTION
DIVISION OF AIR QUALITY**

601 57th Street SE
Charleston, WV 25304
Phone: (304) 926-0475
www.dep.wv.gov/daq

INITIAL/RENEWAL TITLE V PERMIT APPLICATION - GENERAL FORMS

Section 1: General Information

1. Name of Applicant (As registered with the WV Secretary of State's Office): Williams Ohio Valley Midstream LLC (OVM)	2. Facility Name or Location: Fort Beeler Gas Processing Plant
3. DAQ Plant ID No.: 5 1 - 0 0 1 2 7	4. Federal Employer ID No. (FEIN): 2 7 - 0 8 5 6 7 0 8
5. Permit Application Type: <input checked="" type="checkbox"/> Initial Permit <input type="checkbox"/> Permit Renewal <input type="checkbox"/> Update to Initial/Renewal Permit Application When did operations commence? Feb-2011 What is the expiration date of the existing permit? na	
6. Type of Business Entity: <input type="checkbox"/> Corporation <input type="checkbox"/> Government Agency <input checked="" type="checkbox"/> LLC <input type="checkbox"/> Partnership <input type="checkbox"/> Limited Partnership	7. Is the Applicant the: <input type="checkbox"/> Owner <input type="checkbox"/> Operator <input checked="" type="checkbox"/> Both If the Applicant is not both the owner and operator, please provide the name and address of the other party. na
8. Number of On-site Employees: 36	
9. Governmental Code: <input checked="" type="checkbox"/> Privately owned and operated; 0 <input type="checkbox"/> Federally owned and operated; 1 <input type="checkbox"/> State government owned and operated; 2 <input type="checkbox"/> County government owned and operated; 3 <input type="checkbox"/> Municipality government owned and operated; 4 <input type="checkbox"/> District government owned and operated; 5	
10. Business Confidentiality Claims Does this application include confidential information (per 45CSR31)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, identify each segment of information on each page that is submitted as confidential, and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's "PRECAUTIONARY NOTICE-CLAIMS OF CONFIDENTIALITY" guidance.	

11. Mailing Address		
Street or P.O. Box: Williams Ohio Valley Midstream LLC 100 Teletech Drive, Suite 2		
City: Moundsville	State: WV	Zip: 26041
Telephone Number: (304) 843-3103	Fax Number: (304) 843-3131	

12. Facility Location		
Street: 12681 Waynesburg Pike Rd. ~3.8 Miles N-NW of Cameron	City: Cameron	County: Marshall
UTM Easting: 535.00 km	UTM Northing: 4,414.33 km	Zone: <input checked="" type="checkbox"/> 17 <input type="checkbox"/> 18
Directions: From Main St in Cameron - 1) Head North on US-250/Waynesburg Pike ~3.7 mi; 2) Turn Left to continue on US-250 ~2.5 mi; 3) Turn Left onto access road ~0.2 mi; 4) Entrance to site is straight ahead.		
Portable Source?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is facility located w/in a nonattainment area?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, for what air pollutants? na
Is facility located w/n 50 miles of another state?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, name the affected state(s). Ohio and Pennsylvania
Is facility located w/in 100 km of a Class I Area¹?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, name the area(s).
If no, do emissions impact a Class I Area¹?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	na
¹ Class I areas include Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and Shenandoah National Park James River Face Wilderness Area in Virginia.		

13. Contact Information		
Responsible Official: Don Wicburg		Title: Vice President and General Manager
Street or P.O. Box: Williams Ohio Valley Midstream LLC 100 Teletech Drive, Suite 2		
City: Moundsville	State: WV	Zip: 26041
Telephone Number: (304) 843-3158	Fax Number: (304) 843-3131	
E-mail address: Don.Wicburg@Williams.Com		
Environmental Contact: Shanda Durham		Title: Environmental Specialist
Street or P.O. Box: Williams Ohio Valley Midstream LLC 100 Teletech Drive, Suite 2		
City: Moundsville	State: WV	Zip: 26041
Telephone Number: (304) 843-3125	Fax Number: (304) 843-3131	
E-mail address: Shanda.Durham@Williams.Com		
Application Preparer: Walter Konkel, III		Title: Principal Scientist
Company: EcoLogic Environmental Consultants, LLC		
Street or P.O. Box: 864 Windsor Court		
City: Santa Barbara	State: CA	Zip: 93111
Telephone Number: (805) 964-7597	Fax Number: na	
E-mail address: wkonkel@ellogicllc.com		

14. Facility Description

List all processes, products, NAICS and SIC codes for normal operation, in order of priority. Also list any process, products, NAICS and SIC codes associated with any alternative operating scenarios if different from those listed for normal operation.

Process	Products	NAICS	SIC
Natural Gas Processing	Natural Gas and Natural Gas Liquids (NGL)	211112	1311

Provide a general description of operations.

Please reference **SUPPLEMENT 01 – Process Description**

The OVM Fort Beeler GP has the capacity to process 520 MMscfd of raw natural gas through three (3) cryogenic turboexpander plants (TXP). Each TXP is comprised of:

1. Molecular sieve dehydrator to remove water from the raw gas.
2. Cryogenic turboexpander to reduce the gas temperature to approximately minus 120°F. This low temperature condenses much of the ethane (C₂H₆) and most of the other hydrocarbons (primarily propane (C₃H₈) and butane (C₄H₁₀), with de-minimis hexane, benzene, toluene, ethylbenzene, xylene, etc. (together C₅+)).
3. De-methanizer to remove residual methane from the natural gas stream.

As each TXP is a totally enclosed system, the primary emissions are fugitives from piping and equipment.

Auxiliary equipment includes Compressors, Compressor Engines, Emergency Generator Engine, gas-fueled Heaters, 5.0 MMscfd TEG Dehydrator, Storage Tanks, and Pressure Vessels, and Process Flares.

The residue gas stream (primarily methane) is sent to compressors and injected into a natural gas pipeline.

Natural gas liquids (NGL) are either trucked offsite or injected into an NGL pipeline.

15. Provide an Area Map showing plant location as ATTACHMENT A.**16. Provide a Plot Plan(s), e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is located as ATTACHMENT B. For instructions, refer to "Plot Plan - Guidelines."****17. Provide a detailed Process Flow Diagram(s) showing each process or emissions unit as ATTACHMENT C. Process Flow Diagrams should show all emission units, control equipment, emission points, and their relationships.**

Section 2: Applicable Requirements

18. Applicable Requirements Summary	
Instructions: Mark all applicable requirements.	
<input type="checkbox"/> SIP	<input type="checkbox"/> FIP
<input checked="" type="checkbox"/> Minor source NSR (45CSR13)	<input type="checkbox"/> PSD (45CSR14)
<input checked="" type="checkbox"/> NESHAP (45CSR34) (HH, OOOO, and ZZZZ)	<input type="checkbox"/> Nonattainment NSR (45CSR19)
<input checked="" type="checkbox"/> Section 111 NSPS (Dc, KKK, JJJJ, and OOOO)	<input type="checkbox"/> Section 112(d) MACT Standards
<input type="checkbox"/> Section 112(g) Case-by-case MACT	<input checked="" type="checkbox"/> 112(r) RMP
<input type="checkbox"/> Section 112(i) Early Reduction of HAP	<input type="checkbox"/> Consumer/Commercial Prod. Reqts., Sect 183(e)
<input type="checkbox"/> Section 129 Standards/Reqts.	<input checked="" type="checkbox"/> Stratospheric Ozone (Title VI)
<input type="checkbox"/> Tank vessel Reqt., Section 183(f)	<input type="checkbox"/> Emissions Cap 45CSR§30-2.6.2
<input type="checkbox"/> NAAQS, Increments or Visibility (temp. sources)	<input type="checkbox"/> 45CSR27 State Enforceable Only Rule (CPU)
<input checked="" type="checkbox"/> 45CSR4 State Enforceable Only Rule (Malodors)	<input type="checkbox"/> Acid Rain (Title IV, 45CSR33)
<input type="checkbox"/> Emissions Trading and Banking (45CSR28)	<input type="checkbox"/> Compliance Assurance Monitoring (40CFR64)
<input type="checkbox"/> CAIR NOx Annual Trading Program (45CSR39)	<input type="checkbox"/> CAIR NOx Ozone Trading Program (45CSR40)
<input type="checkbox"/> CAIR SO2 Trading Program (45CSR41)	

19. Non Applicability Determinations

Permit Shield

List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.

Please reference **SUPPLEMENT 02 – Regulatory Discussion**

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

- NSPS D - No boiler greater than 250 MMBtu/hr (40CFR60.40(a)(1))
- NSPS Da - No boiler greater than 250 MMBtu/hr (40CFR60.40a(a)(1))
- NSPS Db - No boiler greater than 100 MMBtu/hr (40CFR60.40b(a))
- NSPS K - No tank greater than 40,000 gallons (40CFR 60.110(a))
- NSPS Ka - No tank greater than 151.416 m³ (40,000 gal) (40CFR60.110a(a))
- NSPS Kb - No tank greater than 75 m³ (19,815 gal) (40CFR60.110b(a))
- NSPS GG - No stationary gas turbine (40CFR60.330(a))
- NSPS LLL - No sweetening units on site (40CFR60.640(a))
- NSPS IIII - No stationary compression ignition engine (§60.4200(a))
- NSPS KKKK - No stationary combustion turbine (§60.4300(a))

NATIONAL EMISSION STANDARDS FOR HAZAROUS AIR POLLUTANTS (NESHAP)

- NESHAP HHH - No natural gas transmission or storage prior to local distribution (§63.1270(a))
- NESHAP YYYYY - No stationary gas turbine (§63.6080(a))
- NESHAP DDDDD - Not a major source of HAP (§63.7485(a))
- NESHAP JJJJJ - No boiler as defined (§63.11195(e))

COMPLIANCE ASSURANCE MONITORING (CAM)

- CAM - Although a major source that is required to obtain a part 70 or 71 permit, there is no emission source with pre-controlled emissions > 100 TPY (§64.2a))

WEST VIRGINIA AIR QUALITY REGULATIONS

- 45CSR14 - Permits for Major Sources - Not a major source of air pollutants
- 45CSR19 - Permits for Major Sources - Not a major source of air pollutants
- 45CSR21 - Control of VOCs - Not located in Putnam, Kanawha, Cabell, Wayne, or Wood County
- 45CSR27 - Exempt because equipment is used in the production and distribution of petroleum products
- 45CSR28 - Voluntary Emission Trading Program - Applicant chooses not to participate
- 45CSR29 - Not in Putnam, Kanawha, Cabell, Wayne, or Wood County

20. Facility-Wide Applicable Requirements

List all facility-wide applicable requirements. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number.

(Note: Title V permit condition numbers alone are not the underlying applicable requirements).

Permit R13-2826H includes the following facility-wide requirements:

- 2.5.1 Construct and operate in accordance with the plans and specifications filed in Permit Applications.
- 3.1.1 Open burning [45CSR§6-3.1] - Open burning is prohibited.
- 3.1.3 Asbestos [45CSR§34] - Inspect prior to demolition or renovation.
- 3.1.4 Odors [45CSR§4-3.1] - No objectionable odors beyond the fence-line.
- 3.3.1 Stack Testing [45CSR§13] - Conduct stack testing as required by underlying regulations.
- 3.4.2 Odors [45CSR§4]- Maintain records of odor complaints and corrective actions.
- 3.5.4.1 Emissions Statement [45CSR§30] - Submit annual emissions statement and fees.
- 4.1.2 Minor Source of HAPs - HAP emissions from the facility shall not exceed:
10 tpy of any single HAP and 25 tpy total HAPs.
- 4.1.3 Operation and Maintenance of Air Pollution Control Equipment [45CSR§13-5.11] -
Install, maintain, and operate all APCE to minimize emissions and comply w/ limitations.

Permit Shield

For all facility-wide applicable requirements listed above, provide monitoring/testing / recordkeeping / reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H requires the following monitoring/testing/recordkeeping/reporting requirements:

- 2.6. Furnish any information that the WVDEP may request.
- 2.7. Provide supplemental and corrected data as requisite.
- 2.12.3 Submit notice of emergencies within one (1) working day.
- 3.4.1 Retention of Records - Maintain records of all information required by permit for 5 yrs.
- 3.4.2 Odors - Maintain records of all odor complaints and responses.
- 3.5.1 Responsible Official - Reports, certifications, etc. shall contain a certification by the responsible official.
- 3.5.4.1 Operating fee - Submit a certified emissions statement and pay fees on an annual basis
- 3.5.5 Emissions inventory - Prepare and submit an emission inventory as requested.
- 4.1.1 Record of monitoring - Keep records of monitoring information
- 4.1.4 Air pollution control equipment - Maintain records of malfunctions and operational shutdown of APCE.

Are you in compliance with all facility-wide applicable requirements?

Yes No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

(Not Applicable)

Section 3: Facility-Wide Emissions

23. Facility-Wide Emissions Summary [Tons per Year]	
Criteria Pollutants	Potential Emissions
Carbon Monoxide (CO)	86.14
Nitrogen Oxides (NOX)	91.25
Lead (Pb)	---
Particulate Matter (PM2.5) ¹	6.96
Particulate Matter (PM10) ¹	6.96
Total Particulate Matter (TSP)	6.96
Sulfur Dioxide (SO2)	0.45
Volatile Organic Compounds (VOC)	155.87
Hazardous Air Pollutants²	Potential Emissions
Benzene	3.08
Ethylbenzene	2.68
Formaldehyde (HCHO)	4.54
n-Hexane	3.76
Toluene	4.08
Xylenes	6.98
Other HAP (Acrolein, MeOH, , etc.)	3.04
Total HAP	21.85
Regulated Pollutants other than Criteria, HAP, and GHG	Potential Emissions
na	---
Greenhouse Gases (GHGs)	Potential Emissions
Carbon Dioxide (CO ₂)	94,915
Nitrous Oxide (N ₂ O)	0.17
Methane (CH ₄)	1,029
Hydrofluorocarbons (HFCs)	---
Perfluorocarbons (PFCs)	---
Sulfur hexafluoride (SF ₆)	---
CO ₂ equivalent (CO ₂ e)	120,684
¹ PM2.5 and PM10 are components of TSP.	
² For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.	

Section 4: Insignificant Activities

24. Insignificant Activities (Check all that apply)	
<input checked="" type="checkbox"/>	1 Air compressors and pneumatically operated equipment, including hand tools.
<input checked="" type="checkbox"/>	2 Air contaminant detectors or recorders, combustion controllers or shutoffs.
<input checked="" type="checkbox"/>	3 Any consumer product used in the same manner as in normal consumer use, provided the use results in a duration and frequency of exposure which are not greater than those experienced by consumer, and which may include, but not be limited to, personal use items; janitorial cleaning supplies, office supplies and supplies to maintain copying equipment.
<input checked="" type="checkbox"/>	4 Bathroom/toilet vent emissions.
<input checked="" type="checkbox"/>	5 Batteries and battery charging stations, except at battery manufacturing plants.
<input checked="" type="checkbox"/>	6 Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents. Many lab fume hoods or vents might qualify for treatment as insignificant (depending on the applicable SIP) or be grouped together for purposes of description.
<input type="checkbox"/>	7 Blacksmith forges.
<input type="checkbox"/>	8 Boiler water treatment operations, not including cooling towers.
<input checked="" type="checkbox"/>	9 Brazing, soldering or welding equipment used as an auxiliary to the principal equipment at the source.
<input type="checkbox"/>	10 CO2 lasers, used only on metals and other materials which do not emit HAP in the process.
<input checked="" type="checkbox"/>	11 Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources.
<input checked="" type="checkbox"/>	12 Combustion units designed and used exclusively for comfort heating that use liquid petroleum gas or natural gas as fuel.
<input checked="" type="checkbox"/>	13 Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
<input type="checkbox"/>	14 Demineralized water tanks and demineralizer vents.
<input type="checkbox"/>	15 Drop hammers or hydraulic presses for forging or metalworking.
<input type="checkbox"/>	16 Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.
<input type="checkbox"/>	17 Emergency (backup) electrical generators at residential locations.
<input type="checkbox"/>	18 Emergency road flares.
<input checked="" type="checkbox"/>	19 Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NOx, SO2, VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year aggregate total for each criteria pollutant from all emission units. Please specify all emission units for which this exemption applies along with the quantity of criteria pollutants emitted on an hourly and annual basis: Please see SUPPLEMENT 07 - Storage Tank Data Sheet (Insignificant Emission Units)

24. Insignificant Activities (Check all that apply) (Continued)

<input checked="" type="checkbox"/>	20	Emission units which do not have any applicable requirements and which emit hazardous air pollutants into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year aggregate total for all HAPs from all emission sources. This limitation cannot be used for any source which emits dioxin/furans nor for toxic air pollutants as per 45CSR27. Please specify all emission units for which this exemption applies along with the quantity of hazardous air pollutants emitted on an hourly and annual basis: Please see SUPPLEMENT 07 - Storage Tank Data Sheet
<input type="checkbox"/>	21	Environmental chambers not using hazardous air pollutant (HAP) gases.
<input checked="" type="checkbox"/>	22	Equipment on the premises of industrial and manufacturing operations used solely for the purpose of preparing food for human consumption.
<input type="checkbox"/>	23	Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.
<input checked="" type="checkbox"/>	24	Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.
<input checked="" type="checkbox"/>	25	Equipment used for surface coating, painting, dipping or spray operations, except those that will emit VOC or HAP.
<input checked="" type="checkbox"/>	26	Fire suppression systems.
<input checked="" type="checkbox"/>	27	Firefighting equipment and the equipment used to train firefighters.
<input type="checkbox"/>	28	Flares used solely to indicate danger to the public.
<input checked="" type="checkbox"/>	29	Fugitive emission related to movement of passenger vehicle provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted.
<input type="checkbox"/>	30	Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.
<input checked="" type="checkbox"/>	31	Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.
<input type="checkbox"/>	32	Humidity chambers.
<input checked="" type="checkbox"/>	33	Hydraulic and hydrostatic testing equipment.
<input checked="" type="checkbox"/>	34	Indoor or outdoor kerosene heaters.
<input checked="" type="checkbox"/>	35	Internal combustion engines used for landscaping purposes.
<input type="checkbox"/>	36	Laser trimmers using dust collection to prevent fugitive emissions.
<input type="checkbox"/>	37	Laundry activities, except for dry-cleaning and steam boilers.
<input checked="" type="checkbox"/>	38	Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.
<input type="checkbox"/>	39	Oxygen scavenging (de-aeration) of water.
<input type="checkbox"/>	40	Ozone generators.
<input checked="" type="checkbox"/>	41	Plant maintenance and upkeep activities (e.g., grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. (Cleaning and painting activities qualify if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners/operators must still get a permit if otherwise requested.)

24. Insignificant Activities (Check all that apply) (Continued)		
<input checked="" type="checkbox"/>	42	Portable electrical generators that can be moved by hand from one location to another. "Moved by Hand" means that it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device.
<input type="checkbox"/>	43	Process water filtration systems and demineralizers.
<input checked="" type="checkbox"/>	44	Repair or maintenance shop activities not related to the source's primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification.
<input checked="" type="checkbox"/>	45	Repairs or maintenance where no structural repairs are made and where no new air pollutant emitting facilities are installed or modified.
<input checked="" type="checkbox"/>	46	Routing calibration and maintenance of laboratory equipment or other analytical instruments.
<input type="checkbox"/>	47	Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants. Shock chambers.
<input type="checkbox"/>	48	Shock chambers.
<input type="checkbox"/>	49	Solar simulators.
<input checked="" type="checkbox"/>	50	Space heaters operating by direct heat transfer.
<input checked="" type="checkbox"/>	51	Steam cleaning operations.
<input type="checkbox"/>	52	Steam leaks.
<input type="checkbox"/>	53	Steam sterilizers.
<input type="checkbox"/>	54	Steam vents and safety relief valves.
<input type="checkbox"/>	55	Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.
<input checked="" type="checkbox"/>	56	Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP. Exemptions for storage tanks containing petroleum liquids or other volatile organic liquids should be based on size limits such as storage tank capacity and vapor pressure of liquids stored and are not appropriate for this list.
<input type="checkbox"/>	57	Such other sources or activities as the Director may determine.
<input checked="" type="checkbox"/>	58	Tobacco smoking rooms and areas.
<input checked="" type="checkbox"/>	59	Vents from continuous emissions monitors and other analyzers.

Section 5: Emission Units, Control Devices, and Emission Points

25. Equipment Table

Fill out the **Title V Equipment Table** and provide it as **ATTACHMENT D**.

26. Emission Units

For each emission unit listed in the **Title V Equipment Table**, fill out and provide an **Emission Unit Form** as **ATTACHMENT E**.

For each emission unit not in compliance with an applicable requirement, fill out a **Schedule of Compliance Form** as **ATTACHMENT F. (Not Applicable)**

27. Control Devices

For each control device listed in the **Title V Equipment Table**, fill out and provide an **Air Pollution Control Device Form** as **ATTACHMENT G**.

For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Title V Major Source Threshold Level, refer to the **Compliance Assurance Monitoring (CAM) Form(s)** for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as **ATTACHMENT H. (Not Applicable)**

Section 6: Certification of Information

28. Certification of Truth, Accuracy and Completeness and Certification of Compliance

Note: This Certification must be signed by a responsible official. The original, signed in blue ink, must be submitted with the application. Applications without an original signed certification will be considered as incomplete.

a. Certification of Truth, Accuracy and Completeness

I certify that I am a responsible official (as defined at 45CSR§30-2.38) and am accordingly authorized to make this submission on behalf of the owners or operators of the source described in this document and its attachments. I certify under penalty of law that I have personally examined and am familiar with the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine and/or imprisonment.

b. Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

Responsible official (type or print)

Don Wicburg

Title:

Vice President and General Manager

Responsible official's signature:

Signature: _____

Signature Date: _____

12/3/2014

(Must be signed and dated in blue ink)

Note: Please check all applicable attachments included with this permit application:

<input checked="" type="checkbox"/>	ATTACHMENT A: Area Map
<input checked="" type="checkbox"/>	ATTACHMENT B: Plot Plan(s)
<input checked="" type="checkbox"/>	ATTACHMENT C: Process Flow Diagram(s)
<input checked="" type="checkbox"/>	ATTACHMENT D: Equipment Table
<input checked="" type="checkbox"/>	ATTACHMENT E: Emission Unit Form(s)
<input type="checkbox"/>	ATTACHMENT F: Schedule of Compliance Form(s) (Not Applicable)
<input checked="" type="checkbox"/>	ATTACHMENT G: Air Pollution Control Device Form(s)
<input type="checkbox"/>	ATTACHMENT H: Compliance Assurance Monitoring (CAM) Form(s) (Not Applicable)

All of the required forms and additional information can be found and downloaded from, the DEP website at www.dep.wv.gov/daq, requested by phone (304) 926-0475, and/or obtained through the mail.

ATTACHMENT A

Area (Topographic) Map

Provide an Area Map showing plant location as ATTACHMENT A.

- **Address:**
 - ~0.2 Miles West of US Hwy 250
 - ~0.6 Miles SE of Co Rd-34
 - ~3.8 Miles N-NW of Cameron
 - Cameron, Marshall County, WV 26033

 - **Latitude and Longitude:**
 - 39°52'42.0" N x -80°35'26.5" W
 - (39.8783° N x -80.5907° W)

 - **UTM Coordinates:**
 - 535.0 km Easting x 4,414.3 km Northing - Zone: 17S

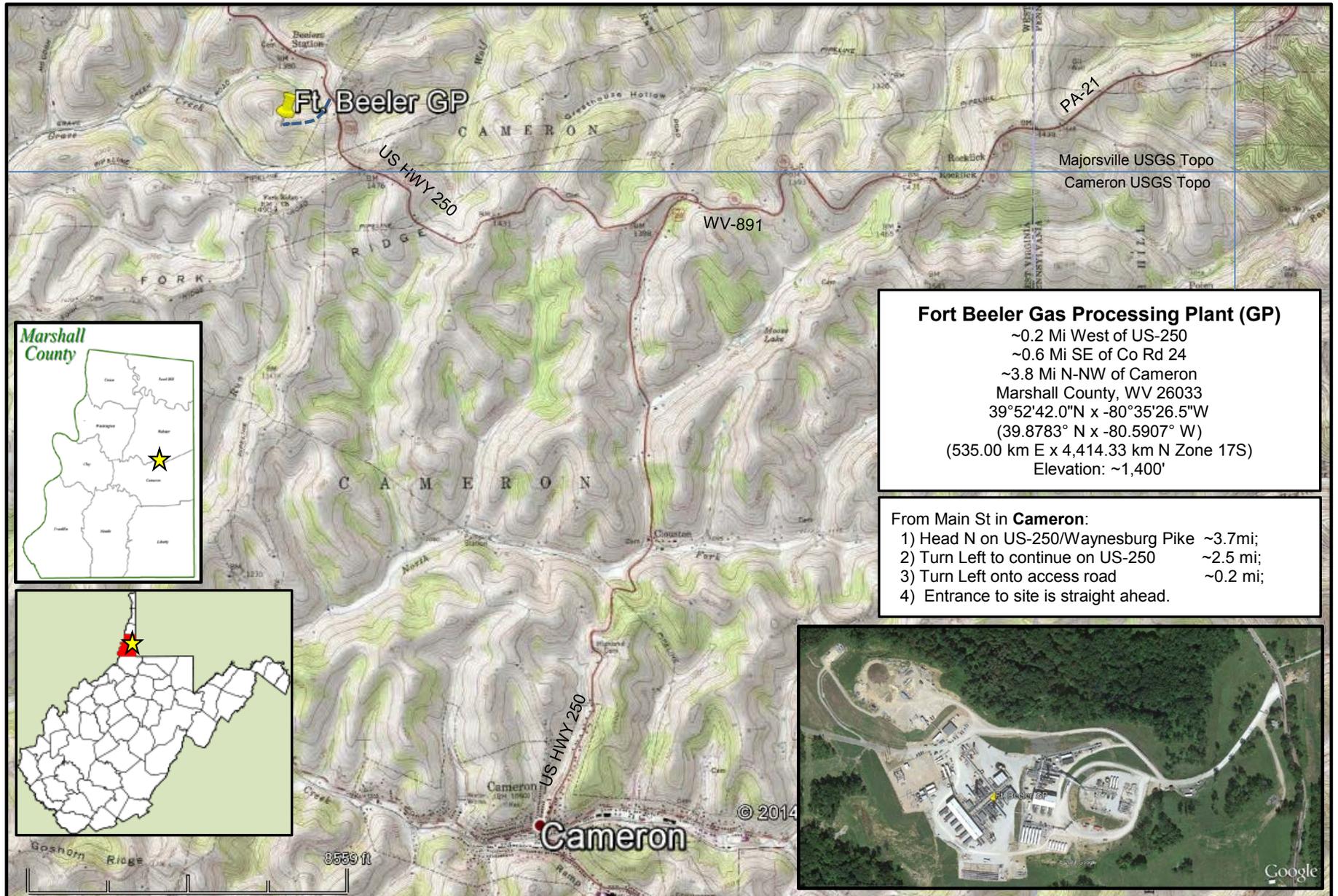
 - **Elevation:**
 - ~1,400'

 - **Directions:**
 - From Main St in Cameron -
 - 1) Head North on US-250/Waynesburg Pike ~3.7 mi;
 - 2) Turn Left to continue on US-250 ~2.5 mi;
 - 3) Turn Left onto access road ~0.2 mi;
 - 4) Entrance to site is straight ahead.
-

- **USGS:**
 - 7.5 Minute Topographic - Majorsville, WV-PA – 2014
-

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
Application for Title V Operating Permit (45CSR30)

Attachment A - Area (Topographic) Map



ATTACHMENT B

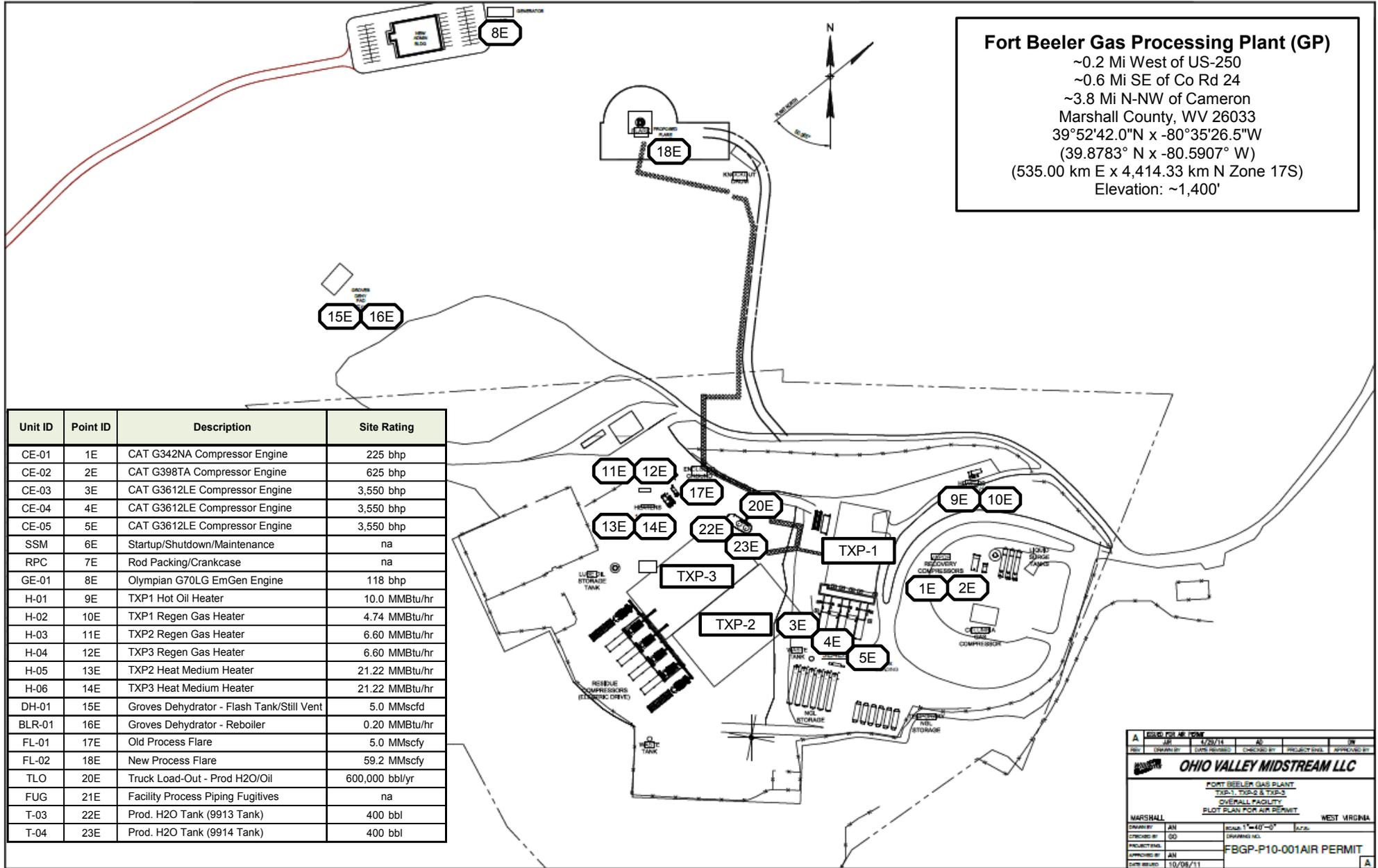
Plot Plans

Provide a Plot Plan(s), e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is located as ATTACHMENT B.

- Plot Plan – OVM Fort Beeler GP
 - Aerial View – OVM Fort Beeler GP
 - Pipeline Map – OVM Fort Beeler GP
-

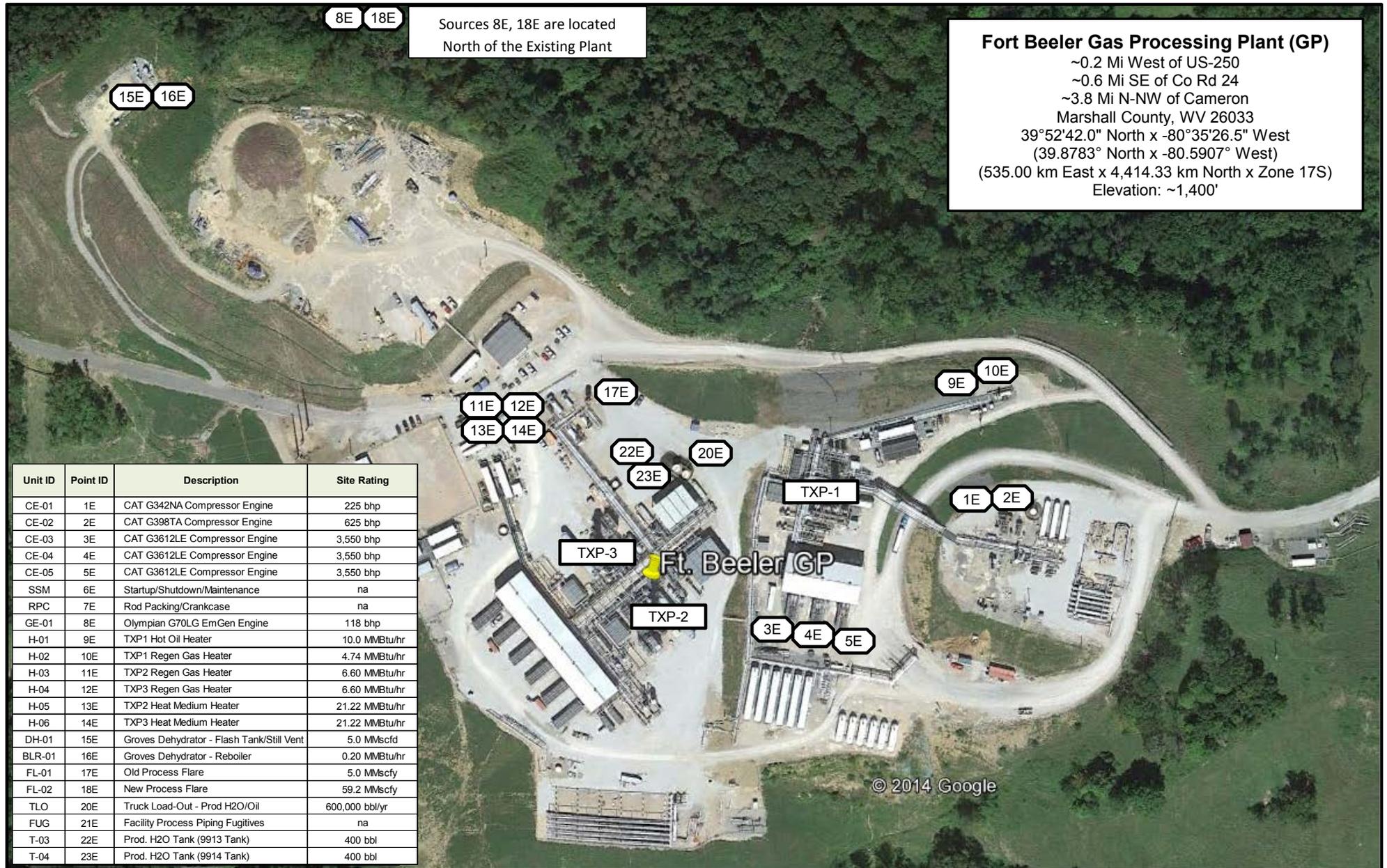
Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Attachment B - Plot Plan



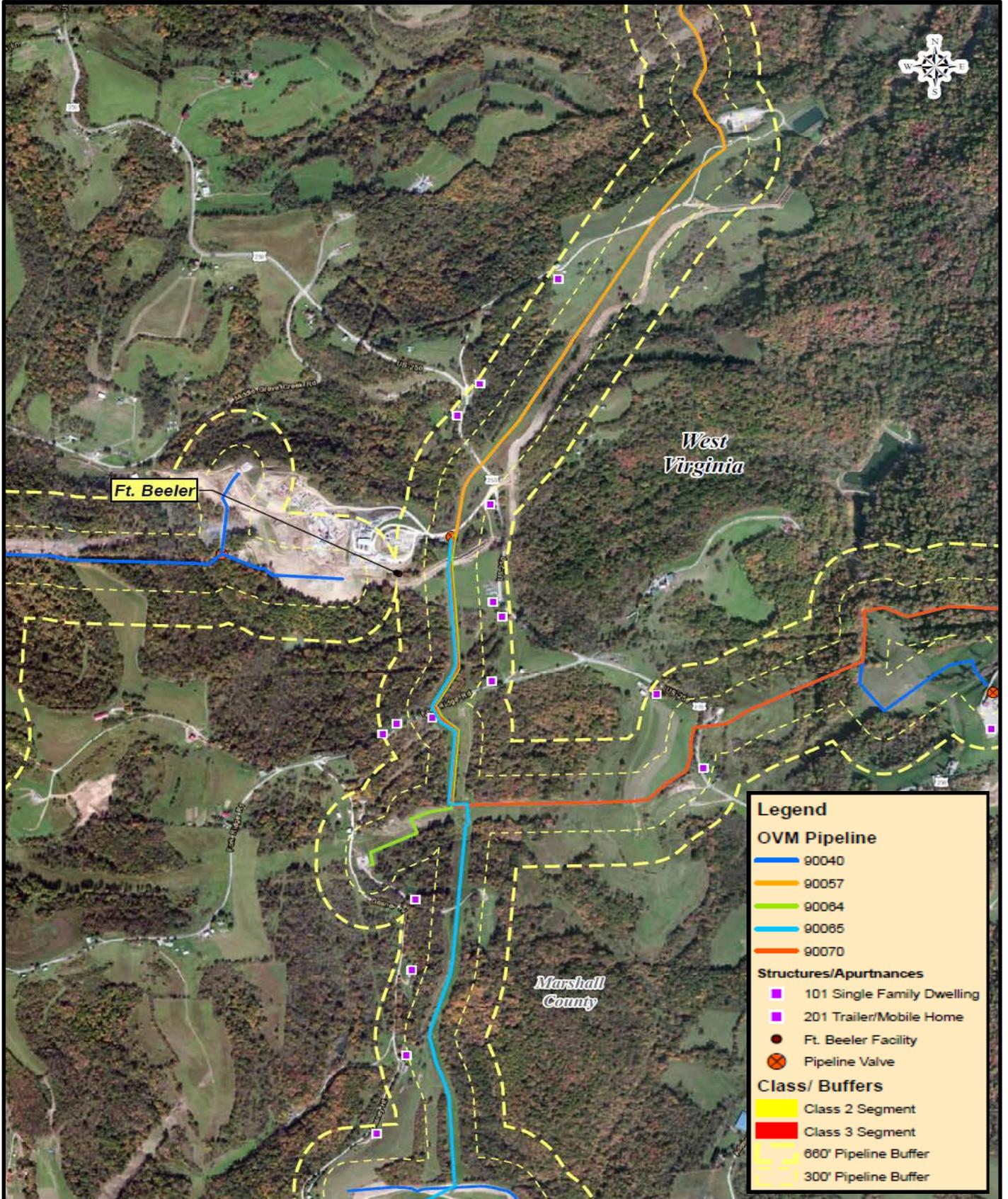
Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Attachment B' - Aerial View



Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
Application for Title V Operating Permit (45CSR30)

Attachment B" - Pipeline Map

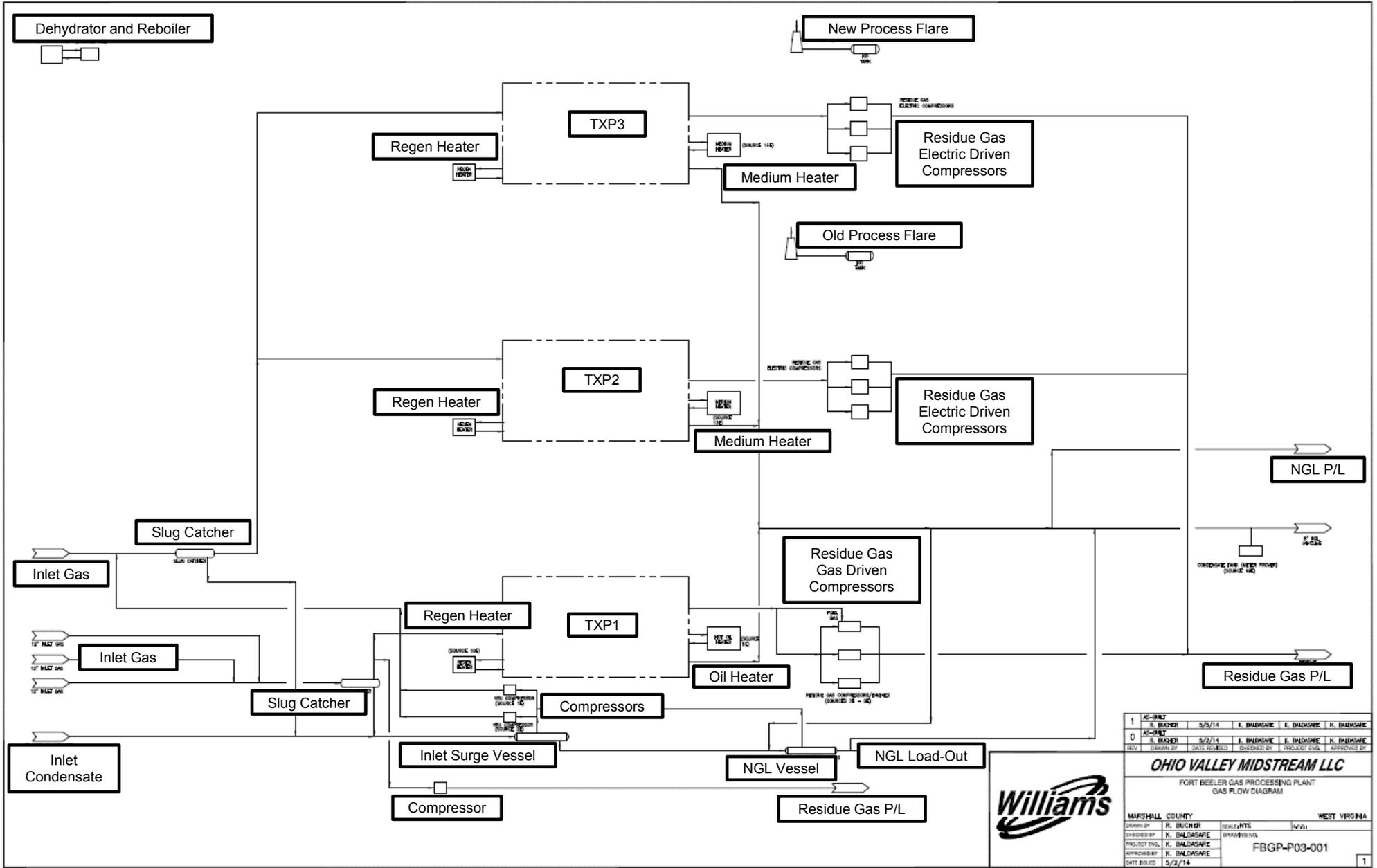


ATTACHMENT C
Process Flow Diagram (PFD)

Provide a detailed Process Flow Diagram(s) showing each process or emissions unit as ATTACHMENT C. Process Flow Diagrams should show all emission units, control equipment, emission points, and their relationships.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Attachment C - Process Flow Diagram (PFD)



1	AC-BUY	5/5/14	E. BALDASARE	E. BALDASARE	K. BALDASARE
0	AC-BUY	5/2/14	E. BALDASARE	E. BALDASARE	K. BALDASARE
REV	DRAWN BY	DATE REVISED	DESIGNED BY	PROJECT ENGR	APPROVED BY
OHIO VALLEY MIDSTREAM LLC					
FORT BEELER GAS PROCESSING PLANT GAS FLOW DIAGRAM					
MARSHALL COUNTY		COUNTY		WEST VIRGINIA	
DRAWN BY	K. BALDASARE	SCALE	AS SHOWN		
CHECKED BY	K. BALDASARE	DRAWN BY	K. BALDASARE		
PROJECT ENGR.	K. BALDASARE	FBGP-P03-001			
APPROVED BY	K. BALDASARE				
DATE BUILT	5/2/14				

ATTACHMENT D
Equipment Table

Fill out the Title V Equipment Table and provide it as ATTACHMENT D.

ATTACHMENT D - Title V Equipment Table
(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 24 of the General Forms)

Emission Point ID ¹	Control Device ¹	Emission Unit ID ¹	Emission Unit Description	Design Capacity	Installed/Modified
Equipment Authorized by R13-2826H - Fort Beeler Gas Processing Plant					
1E	01-NSCR	CE-01	CAT G342NA Compressor Engine	225 bhp	2011
2E	02-NSCR	CE-02	CAT G398TA Compressor Engine	625 bhp	2011
3E	01-OxCat	CE-03	CAT G3612LE Compressor Engine	3,550 bhp	2011
4E	02-OxCat	CE-04	CAT G3612LE Compressor Engine	3,550 bhp	2011
5E	03-OxCat	CE-05	CAT G3612LE Compressor Engine	3,550 bhp	2011
8E	na	GE-01	Olympian G70LG EmGen Engine	118 bhp	tbd
9E	na	H-01	TXP1 Hot Oil Heater	10.00 MMBtu/hr	2011
10E	na	H-02	TXP1 Regen Gas Heater	4.74 MMBtu/hr	2011
11E	na	H-03	TXP2 Regen Gas Heater	6.60 MMBtu/hr	2012
12E	na	H-04	TXP3 Regen Gas Heater	6.60 MMBtu/hr	2012
13E	na	H-05	TXP2 Heat Medium Heater	21.22 MMBtu/hr	2012
14E	na	H-06	TXP3 Heat Medium Heater	21.22 MMBtu/hr	2012
17E	na	FL-01	Old Process Flare	5.00 MMscfy	2012
18E	na	FL-02	New Process Flare	59 MMscfy	tbd
20E	na	TLO	Truck Load-Out - Prod H2O/Oil	600,000 bbl/yr	2011
---	na	T-01	Condensate (Meter Prover Skid Tank)	TO BE REMOVED FROM SERVICE	
22E	na	T-03	Prod. H2O Tank (9913 Tank)	400 bbl	2012
23E	na	T-04	Prod. H2O Tank (9914 Tank)	400 bbl	2012
Please see SUPPLEMENT 7 - Storage Tank Data Sheet (Insignificant Emissions Units) (T-02, T-05 thru T-25, and Pressure Vessels)					
Equipment Authorized by R13-3212 - Groves Dehydration Station					
15E	na	DH-01	Groves Dehydrator - Flash Tank/Still Vent	5.00 MMscfd	2011
16E	na	BLR-01	Groves Dehydrator - Reboiler	0.20 MMBtu/hr	2011

¹For 45CSR13 permitted sources, the numbering system used for the emission points, control devices, and emission units should be consistent with the numbering system used in the 45CSR13 permit. For grandfathered sources, the numbering system should be consistent with registrations or emissions inventory previously submitted to DAQ. For emission points, control devices, and emissions units which have not been previously labeled, use the following 45CSR13 numbering system: 1S, 2S, 3S,... or other appropriate description for emission units; 1C, 2C, 3C,... or other appropriate designation for control devices; 1E, 2E, 3E, ... or other appropriate designation for emission points.

ATTACHMENT E

Emission Unit Forms

For each emission unit listed in the Title V Equipment Table, fill out and provide an Emission Unit Form as ATTACHMENT E.

- 225 bhp CAT G342NA Recovery Compressor Engine (CE-01 (1E))
 - 625 bhp CAT G398TA Recovery Compressor Engine (CE-02 (2E))
 - 3,550 bhp CAT G3612LE Compressor Engines (CE-03 (3E) thru CE-05 (5E))
 - 117 bhp Olympian G70LG Emergency Generator Engine (GE-01 (8E))
 - 10.0 MMBtu/hr TXP1 Hot Oil Heater (H-01 (9E))
 - 4.74 MMBtu/hr TXP1 Regenerator Gas Heater (H-02 (10E))
 - 6.60 MMBtu/hr TXP2 and TXP3 Regenerator Gas Heaters (H-03 (11E) and H-04 (12E))
 - 21.22 MMBtu/hr TXP2 and TXP3 Heat Medium Heaters (H-05 (13E) and H-06 (14E))
 - 5.0 MMscfd Triethylene Glycol (TEG) Dehydrator (DH-01 (15E))
 - 0.20 MMBtu/hr Dehydrator Reboiler (BLR-01 (16E))
 - 5.0 MMscf/yr Old Process Flare (FL-01 (17E))
 - 59.2 MMscf/yr New Process Flare (FL-02 (18E))
 - 600,000 bbl/yr Truck Load-Out - Prod H₂O/Oil (TLO (20E))
 - 400 bbl Produced H₂O/Oil Tanks (T-03 (22E) and T-04 (23E))
 - Facility Process Piping Fugitives (FUG (21E))
-

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		CE-01 (1E)	
Emission unit ID number: CE-01 (1E)	Emission unit name: 225 bhp CAT G342NA (4SRB) Vapor Recovery Compressor Engine 01	List any control devices associated with this emission unit: 01-NSCR	
Provide a description of the emissions unit (type, method of operation, design parameters, etc.): 225 bhp CAT G342NA, Gas-Fired, 4-Stroke Rich-Burn (4SRB), Compressor Engine, w/ Non-Selective Catalytic Reduction (NSCR).			
Manufacturer: Caterpillar (CAT)	Model number: G342NA	Serial number(s): 71B02964	
Construction date: < 06/12/07	Installation date: 2011	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 225 bhp @ 1,200 rpm			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hr/yr	
<i>Fuel Usage Data (fill out all applicable fields)</i>			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> _X_Yes <input type="checkbox"/> _No		If yes, is it? <input type="checkbox"/> _Indirect Fired <input checked="" type="checkbox"/> _X_Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 225 bhp; 1.91 MMBtu/hr (LHV)		Type and Btu/hr rating of burners: 8,500 Btu/bhp-hr (LHV)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas – 2,079 scfh and 18.21 MMscf/yr			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)

<i>Emission Data</i>		CE-01 (1E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	0.99	4.35	
Nitrogen Oxides (NOX)	0.05	0.22	
Lead (Pb)	negligible	negligible	
Particulate Matter (PM2.5)	0.04	0.18	
Particulate Matter (PM10)	0.04	0.18	
Total Particulate Matter (TSP)	0.04	0.18	
Sulfur Dioxide (SO2)	1.2E-03	0.01	
Volatile Organic Compounds (VOC)	0.28	1.22	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	3.4E-03	0.01	
Ethylbenzene	5.3E-05	2.3E-04	
Formaldehyde (HCHO)	0.03	0.13	
n-Hexane	---	---	
Toluene	1.2E-03	0.01	
2,2,4-Trimethylpentane	---	---	
Xylenes	4.1E-04	1.8E-03	
Other HAP	0.02	0.09	
Total HAP	0.05	0.24	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2) (GWP=1)	249.46	1,092.62	
Methane (CH4) (GWP=25)	0.89	3.91	
Nitrous Oxide (N2O) (GWP=298)	4.7E-04	2.0E-03	
CO2 Equivalent (CO2e)	271.92	1,191.00	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>Vendor data and AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following 225 bhp CAT G342NA (CE-01) Compressor Engine limitations and standards:

- 5.1.1. The quantity of natural gas consumed shall not exceed 2,079 scf/hr and 18.21 MMscf/yr.
- 5.1.2. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
CE-01	NOx	0.05	0.22
	CO	0.99	4.35
	VOC	0.28	1.22
	HCHO	0.03	0.13

- 5.1.9. Engines equipped w/ NSCR shall be fitted with a closed-loop, automatic air/fuel ratio controller (AFRC). The AFRC shall control a fuel metering valve to deliver additional fuel when required to ensure a fuel-rich mixture and a resultant exhaust oxygen content of less than or equal to 0.5%. The automatic air/fuel ratio controller shall also incorporate dual-point exhaust gas temperature and oxygen sensors which provide temperature and exhaust oxygen content differential feedback. The AFRC shall provide a warning or indication to the operator and/or be interlocked with the engine ignition system to cease engine operation in case of a masking, poisoning or overrich air/fuel ratio.
- 5.1.15. Be in compliance with the emission limitations, operating limitations, and other requirements at all times. [40CFR§63.6605(a)]
- 5.1.16. At all times, 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. [40CFR§63.6605(b)]
- 5.1.17. Demonstrate compliance by operating and maintaining the engine according to manufacturer's instructions; or develop and follow your own maintenance plan.
- 5.1.18. Comply with the applicable general provisions of NESHAP ZZZZ. [40CFR§63.6640(e)]

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

- 5.1.13. Change oil and filter every 1,440 hours of operation or annually, whichever comes first; and inspect spark plugs, hoses, and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.
- 5.1.20. Report each violation of emission limitation or operating limitation. [40CFR§63.6640(b)]
- 5.2.1.a Regularly inspect, maintain and/or replace catalytic reduction devices, maintain proper operation of the AFRC or AFBC; and follow recommendations of the catalyst manufacturer.
- 5.2.2. Operate and maintain the RICE and after-treatment control device according to manufacturer's emission-related written instructions or develop your own maintenance plan. [40CFR§63.6625(e)]
- 5.2.3. 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. [40CFR§63.6625(h)]
- 5.4.1. Maintain records of the amount of fuel consumed and the hours of operation.
- 5.4.2. Maintain records of all catalytic reduction device maintenance.
- 5.4.3. Maintain records of the following:
 - a. Each notification and report that you submit.
 - b. Records of the occurrence and duration of each malfunction of operation.
 - c. Records of performance tests and performance evaluations.
 - d. Records of maintenance performed on the air pollution control and monitoring equipment.
 - e. Records of actions taken during malfunction to minimize emissions. [40CFR§63.6655(a)]
- 5.4.5. Maintain records of maintenance conducted. [40CFR§63.6655(e)]

Are you in compliance with all applicable requirements for this emission unit?

X Yes _No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		CE-02 (2E)	
Emission unit ID number: CE-02 (2E)	Emission unit name: 625 bhp CAT G398TA (4SRB) Vapor Recovery Compressor Engine 02	List any control devices associated with this emission unit: 02-NSCR	
Provide a description of the emissions unit (type, method of operation, design parameters, etc.): 625 bhp CAT G398TA, Gas-Fired, 4-Stroke Rich-Burn (4SRB), Compressor Engine, w/ Non-Selective Catalytic Reduction (NSCR).			
Manufacturer: Caterpillar (CAT)	Model number: G398TA	Serial number(s): 73B01671	
Construction date: < 06/12/06	Installation date: 2011	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 625 bhp @ 1,200 rpm			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hr/yr	
<i>Fuel Usage Data (fill out all applicable fields)</i>			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 625 bhp; 5.24 MMBtu/hr (LHV)		Type and Btu/hr rating of burners: 8,387 Btu/bhp-hr (LHV)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas – 5,698 scfh and 49.91 MMscf/yr			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)

<i>Emission Data</i>		CE-02 (2E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	0.69	3.04	
Nitrogen Oxides (NOX)	0.69	3.02	
Lead (Pb)	negligible	negligible	
Particulate Matter (PM2.5)	0.11	0.49	
Particulate Matter (PM10)	0.11	0.49	
Total Particulate Matter (TSP)	0.11	0.49	
Sulfur Dioxide (SO2)	3.4E-03	0.01	
Volatile Organic Compounds (VOC)	0.09	0.39	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	1.8E-03	0.01	
Ethylbenzene	2.9E-05	1.3E-04	
Formaldehyde (HCHO)	0.03	0.14	
n-Hexane	---	---	
Toluene	6.5E-04	2.8E-03	
2,2,4-Trimethylpentane	---	---	
Xylenes	4.1E-04	9.9E-04	
Other HAP	0.01	0.05	
Total HAP	0.05	0.20	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2) (GWP=1)	683.72	2,994.71	
Methane (CH4) (GWP=25)	1.10	4.83	
Nitrous Oxide (N2O) (GWP=298)	1.3E-03	5.6E-03	
CO2 Equivalent (CO2e)	712	3,117	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>Vendor data and AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following 625 bhp CAT G398TA (CE-02) Compressor Engine limitations and standards:

- 5.1.3. The quantity of natural gas consumed shall not exceed 5,698 scf/hr and 49.91 MMscf/yr.
- 5.1.4. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
CE-02	NOx	0.69	3.02
	CO	0.69	3.04
	VOC	0.09	0.39
	HCHO	0.03	0.14

- 5.1.9. Engine equipped w/ NSCR shall be fitted with a closed-loop, automatic air/fuel ratio controller (AFRC). The AFRC shall control a fuel metering valve to deliver additional fuel when required to ensure a fuel-rich mixture and a resultant exhaust oxygen content of less than or equal to 0.5%. The automatic air/fuel ratio controller shall also incorporate dual-point exhaust gas temperature and oxygen sensors which provide temperature and exhaust oxygen content differential feedback. The AFRC shall provide a warning or indication to the operator and/or be interlocked with the engine ignition system to cease engine operation in case of a masking, poisoning or overrich air/fuel ratio.
- 5.1.15. Be in compliance with the emission limitations, operating limitations, and other requirements at all times. [40CFR§63.6605(a)]
- 5.1.16. At all times, operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment. [40CFR§63.6605(b)]
- 5.1.17. Demonstrate compliance by operating and maintaining the engine according to manufacturer's instructions; or develop and follow your own maintenance plan.
- 5.1.18. Comply with the applicable general provisions of NESHP ZZZZ. [40CFR§63.6640(e)]

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

- 5.1.13. Change oil and filter every 2,160 hours of operation or annually, whichever comes first; and inspect spark plugs, hoses, and belts every 2,160 hours of operation or annually, whichever comes first, and replace as necessary.
- 5.1.19. Evaluate the "remote" status every 12 months. Keep records of the initial and annual evaluation. [40CFR§63.6603(f)]
- 5.1.20. Report each violation of emission limitation or operating limitation. [40CFR§63.6640(b)]
 - 5.2.1. a. Regularly inspect, maintain and/or replace catalytic reduction devices, maintain proper operation of the AFRC or AFBC; and follow recommendations of the catalyst manufacturer.
 - 5.2.2. Operate and maintain the RICE and after-treatment control device according to manufacturer's emission-related written instructions or develop your own maintenance plan. [40CFR§63.6625(e)]
 - 5.2.3. 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. [40CFR§63.6625(h)]
 - 5.4.1. Maintain records of the amount of fuel consumed and the hours of operation of each engine.
 - 5.4.2. Maintain records of all catalytic reduction device maintenance.
 - 5.4.3. Maintain records of the following:
 - a. Each notification and report that you submit.
 - b. Records of the occurrence and duration of each malfunction of operation.
 - c. Records of performance tests and performance evaluations.
 - d. Records of maintenance performed on the air pollution control and monitoring equipment.
 - e. Records of actions taken during malfunction to minimize emissions. [40CFR§63.6655(a)]
 - 5.4.4. Keep records specified in the maintenance plan. [40CFR§63.6655(d)]
 - 5.4.5. Maintain records of maintenance conducted on the engine. [40CFR§63.6655(e)]

Are you in compliance with all applicable requirements for this emission unit?

Yes No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description		CE-03 (3E) thru CE-05 (5E) (Each)	
Emission unit ID number: CE-03 (3E) thru CE-05 (5E) (Each)	Emission unit name: 3,550 bhp CAT G3612LE (4SLB) TXP1 Compressor Engines 03 thru 05 (Each)	List any control devices associated with this emission unit: 01-OxCat, 02-OxCat 03-OxCat	
Provide a description of the emissions unit (type, method of operation, design parameters, etc.): Three (3) 3,550 bhp CAT G3612LE, Gas-Fired, 4-Stroke Lean-Burn (4SLB), Compressor Engines, w/ Oxidation Catalyst (OxCat) (Each).			
Manufacturer: Caterpillar (CAT)	Model number: G3516LE	Serial number(s): 1YG00128, 1YG00256, BKE00301	
Construction date: < 06/12/06	Installation date: 2011	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 3,550 bhp @ 1,000 rpm (Each)			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hr/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 3,550 bhp; 23.53 MMBtu/hr (LHV)		Type and Btu/hr rating of burners: 6,629 Btu/bhp-hr (LHV)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas – 5,698 scfh and 49.91 MMscf/yr			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)

<i>Emission Data</i>		CE-03 (3E) thru CE-05 (5E) (Each)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	2.15	9.43	
Nitrogen Oxides (NOX)	3.91	17.14	
Lead (Pb)	negligible	negligible	
Particulate Matter (PM2.5)	0.26	1.14	
Particulate Matter (PM10)	0.26	1.14	
Total Particulate Matter (TSP)	0.26	1.14	
Sulfur Dioxide (SO2)	1.5E-02	0.07	
Volatile Organic Compounds (VOC)	2.85	12.48	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	5.7E-03	0.03	
Ethylbenzene	5.2E-04	2.3E-03	
Formaldehyde (HCHO)	0.31	1.34	
n-Hexane	0.01	0.06	
Toluene	5.3E-03	0.02	
2,2,4-Trimethylpentane	9.8E-04	0.00	
Xylenes	2.4E-03	1.1E-02	
Other HAP	0.22	0.97	
Total HAP	0.56	2.43	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2) (GWP=1)	3,451.45	15,117.34	
Methane (CH4) (GWP=25)	42.81	187.51	
Nitrous Oxide (N2O) (GWP=298)	5.8E-03	2.5E-02	
CO2 Equivalent (CO2e)	4,523.42	19,812.59	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>Vendor data and AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following 3,550 bhp CAT G3612LE (CE-03 thru -05) Compressor Engine limitations and standards:

5.1.5. The quantity of natural gas consumed shall not exceed 25,579 scf/hr and 224.07 MMscf/yr per unit.

5.1.6. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
CE-03 CE-04 CE-05	NOx	3.91	17.14
	CO	2.15	9.43
	VOC	2.85	12.48
	HCHO	0.31	1.34

5.1.9. Engine equipped w/ OxCat shall be fitted with a closed-loop, automatic feedback controller (AFRC) to ensure emissions of regulated pollutants do not exceed the potential to emit for any engine/OxCat combination under varying load. The AFRC shall provide a warning or indication to the operator and/or be interlocked with the engine ignition system to cease engine operation in case of a masking poisoning or overrich air/fuel ratio.

5.1.15. Be in compliance with the emission limitations, operating limitations, and other requirements at all times. [40CFR§63.6605(a)]

5.1.16. At all times, 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. [40CFR§63.6605(b)]

5.1.17. Demonstrate compliance by operating and maintaining the engine according to manufacturer's instructions; or develop and follow your own maintenance plan.

5.1.18. Comply with the applicable general provisions of NESHAP ZZZZ. [40CFR§63.6640(e)]

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

- 5.1.13. Change oil and filter every 2,160 hours of operation or annually, whichever comes first; and inspect spark plugs, hoses, and belts every 2,160 hours of operation or annually, whichever comes first, and replace as necessary.
- 5.1.14. Evaluate the "remote" status every 12 months. Keep records of the initial and annual evaluation. [40CFR§63.6603(a)]
- 5.2.1. Regularly inspect, maintain and/or replace catalytic reduction devices, maintain proper operation of the AFRC or AFBC; and follow recommendations of the catalyst manufacturer.
- 5.2.2. Operate and maintain the RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan. [40CFR§63.6625(e)]
- 5.2.3. 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. [40CFR§63.6625(h)]
- 5.4.1. Maintain records of the amount of fuel consumed and the hours of operation of each engine.
- 5.4.2. Maintain records of all catalytic reduction device maintenance.
- 5.4.3. Maintain records of the following:
 - a. Each notification and report that you submit.
 - b. Records of the occurrence and duration of each malfunction of operation.
 - c. Records of performance tests and performance evaluations.
 - d. Records of maintenance performed on the air pollution control and monitoring equipment.
 - e. Records of actions taken during periods of malfunction to minimize emissions.
 - e. Records of actions taken during malfunction to minimize emissions. [40CFR§63.6655(a)]
- 5.4.4. Keep records specified in the maintenance plan. [40CFR§63.6655(d)]
- 5.4.5. Maintain records of maintenance conducted on the engine. [40CFR§63.6655(e)]

Are you in compliance with all applicable requirements for this emission unit?

Yes No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		GE-01 (8E)	
Emission unit ID number: GE-01 (8E)	Emission unit name: 118 bhp Olympian G70LG (4SRB) Emergency Generator Engine 01	List any control devices associated with this emission unit: na	
Provide a description of the emissions unit (type, method of operation, design parameters, etc.): 118 bhp Olympian G70LG, Gas- or Propane-Fired, 4-Stroke Rich-Burn (4SRB), Compressor Engine. Generator engine will be used to provide electrical power for various activities at the site in the event of loss of purchase power. The emergency generator engine will burn either natural gas or propane fuel.			
Manufacturer: Olympian	Model number: G70LG	Serial number(s): TBD	
Construction date: na	Installation date: TBD	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 118 bhp @ 1,800 rpm			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 500 hr/yr	
<i>Fuel Usage Data (fill out all applicable fields)</i>			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> _X_Yes <input type="checkbox"/> _No		If yes, is it? <input type="checkbox"/> _Indirect Fired <input checked="" type="checkbox"/> _X_Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 118 bhp; 0.91 MMBtu/hr (LHV)		Type and Btu/hr rating of burners: 7,650 Btu/bhp-hr (LHV)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas – 985 scfh and 0.50 MMscf/yr OR Propane – 386 scfh and 0.20 MMscf/yr			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)
Propane	0.25 grains/100 scf	negligible	2,350 Btu/scf (LHV)

<i>Emission Data</i>		GE-01 (8E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	29.10	7.28	
Nitrogen Oxides (NOX)	0.93	0.23	
Lead (Pb)	negligible	negligible	
Particulate Matter (PM2.5)	0.03	0.01	
Particulate Matter (PM10)	0.03	0.01	
Total Particulate Matter (TSP)	0.03	0.01	
Sulfur Dioxide (SO2)	8.9E-04	2.2E-04	
Volatile Organic Compounds (VOC)	0.38	0.10	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	2.4E-03	6.0E-04	
Ethylbenzene	3.7E-05	9.4E-06	
Formaldehyde (HCHO)	0.03	0.01	
n-Hexane	---	---	
Toluene	8.4E-04	2.1E-04	
2,2,4-Trimethylpentane	---	---	
Xylenes	2.9E-04	7.4E-05	
Other HAP	0.01	3.6E-03	
Total HAP	0.05	0.01	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2) (GWP=1)	136.32	34.08	
Methane (CH4) (GWP=25)	1.26	0.31	
Nitrous Oxide (N2O) (GWP=298)	1.3E-03	3.3E-04	
CO2 Equivalent (CO2e)	168.17	42.04	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>Vendor data and AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number.
 (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following 118 bhp Olympian G70LG (GE-01) Emergency Generator Engine limitations and standards:

5.1.7. The maximum yearly hours of operation shall not exceed 500 hours/yr.

5.1.8. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
GE-01	NOx	0.93	0.23
	CO	29.10	7.28
	VOC	0.38	0.10

5.1.10. Install a non-resettable hour meter. [40CFR§60.4237(c)]

5.1.11. Achieve the emission standards as required in §60.4233 over the entire life of the engine:

Unit ID	Pollutant	g/HP-hr
GE-01	NOx + HC	10
	CO	387

[40CFR§60.4234]

5.1.12. Maintenance checks and readiness testing limited to 100 hours per year. [40CFR§60.4243(d)]

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

- 5.3.1. Conduct an initial performance test to demonstrate compliance with the emission standards.
[40CFR§60.4244(a)]
- 5.4.1. Maintain records of the type and amount of fuel consumed and the hours of operation.
- 5.4.6. Maintain records of the following:
 - a. All notifications submitted and all documentation supporting any notification.
 - b. Maintenance conducted on the engine.
 - c. Documentation that the engine meets the emission standards. [40CFR§60.4245(a)]

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		H-01 (9E)	
Emission unit ID number: H-01 (9E)	Emission unit name: TXP1 Hot Oil Heater 01	List any control devices associated with this emission unit:	
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): 10.0 MMBtu/hr Gas-Fired Hot Oil Heater. The hot oil heater is used on the NGL de-methanizer.			
Manufacturer: Heatec, Inc.	Model number: HCI-8010-50-G	Serial number(s): HI08-254	
Construction date: na	Installation date: 2011	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 10.0 MMBtu/hr (LHV)			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hrs/yr	
<i>Fuel Usage Data (fill out all applicable fields)</i>			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, is it? <input checked="" type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 10 MMBtu/hr (LHV)		Type and Btu/hr rating of burners: 10 MMBtu/hr (LHV)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)

<i>Emission Data</i>		H-01 (9E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	0.91	4.00	
Nitrogen Oxides (NOX)	1.09	4.76	
Lead (Pb)	---	---	
Particulate Matter (PM2.5)	0.08	0.36	
Particulate Matter (PM10)	0.08	0.36	
Total Particulate Matter (TSP)	0.08	0.36	
Sulfur Dioxide (SO2)	0.01	0.03	
Volatile Organic Compounds (VOC)	0.06	0.26	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	2.3E-05	1.0E-04	
Ethylbenzene	---	---	
Formaldehyde (HCHO)	8.2E-04	3.6E-03	
n-Hexane	0.02	0.09	
Toluene	3.7E-05	1.6E-04	
2,2,4-Trimethylpentane	---	---	
Xylenes	2.1E-05	---	
Other HAP	0.02	9.0E-05	
Total HAP	1296.92	0.09	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	1,296.92	5,680.52	
Methane (CH4)	0.02	0.11	
Nitrous Oxide (N2O)	2.4E-03	0.01	
CO2 Equivalent (CO2e)	1,298.26	5,686.39	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following TXP-1 Hot Oil Heater (H-01) limitations and standards:

6.1.1. The design heat input shall not exceed 10.00 MMBtu/hr.

6.1.2. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
H-01	NOx	1.09	4.76
	CO	0.91	4.00
	VOC	0.06	0.26

6.1.3. The quantity of gas consumed shall not exceed 260,870 scfd and 95.22 MMscfy.

6.1.13. Opacity shall not exceed 10% based on a 6-min block average. [45CSR§2-3.1.]

6.1.14. The boiler is an NSPS Dc affected source w/ MDHI ≥ 10 MMBtu/hr. [40CFR§60.40c(a)]

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

6.2.1. Compliance with the visible emission requirements as per 40 CFR Part 60, Appendix A, Method 9.

[45CSR§2-3.2.]

6.4.6. Maintain records of amount of natural gas consumed each calendar month. [40CFR§60.48 (c)(g)(2)]

6.4.8. Maintain records of each visible emissions check.

6.5.1. Report violations of Method 9 opacity as soon as practicable, but within 10 days of the occurrence.

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the Schedule of Compliance Form as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		H-02 (10E)	
Emission unit ID number: H-02 (10E)	Emission unit name: TXP1 Regenerator Gas Heater 02	List any control devices associated with this emission unit:	
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): 4.74 MMBtu/hr Gas-Fired Regenerator Gas Heater. The regen heater is used to regenerate the mole-sieves necessary to further dry the inlet gas.			
Manufacturer: Heatec, Inc.	Model number: HCI-1010-40-G	Serial number(s): HI08-252	
Construction date: na	Installation date: 2011	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 4.74 MMBtu/hr (LHV)			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hrs/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, is it? <input checked="" type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 4.74 MMBtu/hr (LHV)		Type and Btu/hr rating of burners: 4.74 MMBtu/hr (LHV)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)

<i>Emission Data</i>		H-02 (10E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	0.43	1.90	
Nitrogen Oxides (NOX)	0.52	2.26	
Lead (Pb)	---	---	
Particulate Matter (PM2.5)	0.04	0.17	
Particulate Matter (PM10)	0.04	0.17	
Total Particulate Matter (TSP)	0.04	0.17	
Sulfur Dioxide (SO2)	3.1E-03	0.01	
Volatile Organic Compounds (VOC)	0.03	0.12	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	1.1E-05	4.7E-05	
Ethylbenzene	---	---	
Formaldehyde (HCHO)	3.9E-04	1.7E-03	
n-Hexane	0.01	0.04	
Toluene	1.8E-05	7.7E-05	
2,2,4-Trimethylpentane	---	---	
Xylenes	9.8E-06	---	
Other HAP	0.01	4.3E-05	
Total HAP	614.74	0.04	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	614.74	2,692.57	
Methane (CH4)	0.01	0.05	
Nitrous Oxide (N2O)	0.00	0.01	
CO2 Equivalent (CO2e)	615.38	2,695.35	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following TXP1 Regenerator Gas Heater (H-02) limitations and standards:

6.1.4. The design heat input shall not exceed 4.74 MMBtu/hr.

6.1.5. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
H-02	NOx	0.52	2.26
	CO	0.43	1.90
	VOC	0.03	0.12

6.1.6. The quantity of gas consumed shall not exceed 123,650 scfd and 45.13 MMscfy.

6.1.13. Opacity shall not exceed 10% based on a 6-min block average. [45CSR§2-3.1.]

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

6.2.1. Compliance with the visible emission requirements as per 40 CFR Part 60, Appendix A, Method 9.

[45CSR§2-3.2.]

6.4.2. Maintain records of the amount of natural gas consumed each calendar month.

6.4.8. Maintain records of each visible emissions check.

6.5.1. Report violations of Method 9 opacity as soon as practicable, but within 10 days of the occurrence.

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the Schedule of Compliance Form as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		H-03 (11E) and H-04 (12E) (Each)	
Emission unit ID number: H-03 (11E) and H-04 (12E) (Each)	Emission unit name: TXP2 and TXP3 Regenerator Gas Heaters 03 and 04 (Each)	List any control devices associated with this emission unit: na	
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): 6.60 MMBtu/hr Gas-Fired Regenerator Gas Heaters (Each). The regen heaters are used to regenerate the mole-sieves necessary to further dry the inlet gas			
Manufacturer: Heatec, Inc.	Model number: HCI-5010-40-G	Serial number(s): HI10-208 (11E), HI11-126 (12E)	
Construction date: na	Installation date: 2012	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 6.60 MMBtu/hr (LHV) (Each)			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hrs/yr	
<i>Fuel Usage Data (fill out all applicable fields)</i>			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, is it? <input checked="" type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 6.60 MMBtu/hr (LHV) (Each)		Type and Btu/hr rating of burners: 6.60 MMBtu/hr (LHV) (Each)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)

<i>Emission Data</i>		H-03 (11E) and H-04 (12E) (Each)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	0.60	2.64	
Nitrogen Oxides (NOX)	0.72	3.14	
Lead (Pb)	---	---	
Particulate Matter (PM2.5)	0.05	0.24	
Particulate Matter (PM10)	0.05	0.24	
Total Particulate Matter (TSP)	0.05	0.24	
Sulfur Dioxide (SO2)	4.3E-03	0.02	
Volatile Organic Compounds (VOC)	0.04	0.17	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	1.5E-05	6.6E-05	
Ethylbenzene	---	---	
Formaldehyde (HCHO)	5.4E-04	2.4E-03	
n-Hexane	0.01	0.06	
Toluene	2.4E-05	1.1E-04	
2,2,4-Trimethylpentane	---	---	
Xylenes	1.4E-05	---	
Other HAP	0.01	6.0E-05	
Total HAP	855.97	0.06	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	855.97	3,749.14	
Methane (CH4)	0.02	0.07	
Nitrous Oxide (N2O)	0.00	0.01	
CO2 Equivalent (CO2e)	856.85	3,753.01	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following TXP2 and TXP3 Regenerator Gas Heater (H-03 and -04) Limitations and Standards:

6.1.7. The design heat input shall not exceed 6.60 MMBtu/hr.

6.1.8. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
H-03 H-04	NOx	0.72	3.14
	CO	0.60	2.64
	VOC	0.04	0.17

6.1.9. The quantity of gas consumed shall not exceed 172,170 scfd and 62.84 MMscfy.

6.1.13. Opacity shall not exceed 10% based on a 6-min block average. [45CSR§2-3.1.]

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

6.2.1. Compliance with the visible emission requirements as per 40 CFR Part 60, Appendix A, Method 9. [45CSR§2-3.2.]

6.4.3. Maintain records of the amount of natural gas consumed each calendar month.

6.4.8. Maintain records of all each visible emissions checks.

6.5.1. Report violations of Method 9 opacity as soon as practicable, but within 10 days of the occurrence.

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the Schedule of Compliance Form as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description		H-05 (13E) and H-06 (14E) (Each)	
Emission unit ID number: H-05 (13E) and H-06 (14E) (Each)	Emission unit name: TXP2 and TXP3 Heat Medium Heaters 05 and 06 (Each)	List any control devices associated with this emission unit: na	
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): 21.22 MMBtu/hr Gas-Fired Heat Medium Heaters (Each). The heat medium heaters are used on the de-methanizers.			
Manufacturer: Heatec, Inc.	Model number: HCI-10010-40-D	Serial number(s): HI11-017 (13E), HI11-127 (14E)	
Construction date: na	Installation date: 2012	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 21.22 MMBtu/hr (LHV) (Each)			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hrs/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, is it? <input checked="" type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 21.22 MMBtu/hr (LHV) (Each)		Type and Btu/hr rating of burners: 21.22 MMBtu/hr (LHV) (Each)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)

<i>Emission Data</i>		H-05 (13E) and H-06 (14E) (Each)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	1.94	8.49	
Nitrogen Oxides (NOX)	2.31	10.10	
Lead (Pb)	---	---	
Particulate Matter (PM2.5)	0.18	0.77	
Particulate Matter (PM10)	0.18	0.77	
Total Particulate Matter (TSP)	0.18	0.77	
Sulfur Dioxide (SO2)	1.4E-02	0.06	
Volatile Organic Compounds (VOC)	0.13	0.56	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	4.8E-05	2.1E-04	
Ethylbenzene	---	---	
Formaldehyde (HCHO)	1.7E-03	0.01	
n-Hexane	0.04	0.18	
Toluene	7.8E-05	3.4E-04	
2,2,4-Trimethylpentane	---	---	
Xylenes	---	---	
Other HAP	4.4E-05	1.9E-04	
Total HAP	0.04	0.19	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	2,752.07	12,054.06	
Methane (CH4)	0.05	0.23	
Nitrous Oxide (N2O)	0.01	0.02	
CO2 Equivalent (CO2e)	2,754.91	12,066.51	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following TXP2 and TXP3 Regenerator Gas Heater (H-03 and -04) Limitations and Standards:

6.1.10. The design heat input shall not exceed 21.22 MMBtu/hr.

6.1.11. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
H-05 H-06	NOx	2.31	10.10
	CO	1.94	8.49
	PM10	0.18	0.77
	VOC	0.13	0.56

6.1.12. The quantity of gas consumed shall not exceed 553,570 scfd and 202.05 MMscfy.

6.1.13. Opacity shall not exceed 10% based on a 6-min block average. [45CSR§2-3.1.]

6.1.14. Each boiler is an NSPS Dc affected source w/ MDHI ≥ 10 MMBtu/hr. [40CFR§60.40c(a)]

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

6.2.1. Compliance with the visible emission requirements as per 40 CFR Part 60, Appendix A, Method 9. [45CSR§2-3.2.]

6.4.6. Maintain records of amount of natural gas consumed each calendar month. [40CFR§60.48 (c)(g)(2)]

6.4.8. Maintain records of each visible emissions check.

6.5.1. Report violations of Method 9 opacity as soon as practicable, but within 10 days of the occurrence.

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the Schedule of Compliance Form as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		DH-01 (15E)	
Emission unit ID number: DH-01 (15E)	Emission unit name: 5.0 MMBtu/hr TEG Dehydrator 01 (Flash Tank and Still Vent)	List any control devices associated with this emission unit: na	
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): 5.0 MMscfd Triethylene Glycol (TEG) Dehydrator Flash Tank and Still Vent. The glycol dehydrator (and associated reboiler) is used to dehydrate a portion of the inlet gas coming into the facility from the Lucey line.			
Manufacturer: KWI	Model number: na	Serial number(s): na	
Construction date: na	Installation date: 2011	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 5.0 MMscfd			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hrs/yr	
<i>Fuel Usage Data (fill out all applicable fields)</i>			
Does this emission unit combust fuel? ___Yes ___X_No		If yes, is it? na ___ Indirect Fired ___Direct Fired	
Maximum design heat input and/or maximum horsepower rating: na		Type and Btu/hr rating of burners: na	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. na			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
na			

<i>Emission Data</i>		DH-01 (15E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	na	na	
Nitrogen Oxides (NOX)	na	na	
Lead (Pb)	na	na	
Particulate Matter (PM2.5)	na	na	
Particulate Matter (PM10)	na	na	
Total Particulate Matter (TSP)	na	na	
Sulfur Dioxide (SO2)	na	na	
Volatile Organic Compounds (VOC)	3.88	17.00	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	0.07	0.31	
Ethylbenzene	---	---	
Formaldehyde (HCHO)	---	---	
n-Hexane	0.07	0.30	
Toluene	0.31	1.34	
2,2,4-Trimethylpentane	---	---	
Xylenes	0.98	4.27	
Other HAP	---	---	
Total HAP	1.42	6.22	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	---	---	
Methane (CH4)	5.14	22.50	
Nitrous Oxide (N2O)	---	---	
CO2 Equivalent (CO2e)	128.40	562.40	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). GRI-GLYCalc 4.0</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-3212 includes the following dehydration unit (DH-01) Limitations and Standards:

- 6.1.1. The maximum dry natural gas throughput shall not exceed 5.0 mmscf/day.
- 6.1.2. The glycol dehydration reboiler (DH-01) shall be designed and operated in accordance with the following:
 - a. At least 50% of the dehydrator flash tank will be routed to the reboiler and burned as fuel.
Natural gas may be used as supplemental fuel.
 - b. The vapors from the flash tank shall be introduced into the flame zone of the reboiler.
- 6.1.3. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
DH-01	VOC	3.88	17.00
	Benzene	0.07	0.31
	Toluene	0.31	1.34
	Xylenes	0.98	4.27

- 6.1.4. Methods specified in NESHAP HH shall be used to determine potential HAP emissions.
- 6.1.5. Update major source determination within one year of the prior determination using gas composition data measured during the preceding 12 months for any source that has actual emissions > 50% of the major source thresholds.
- 6.1.6. Permittee is exempt from requirements of 40CFR§63.764(d) if actual average benzene emissions < 1 TPY.

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-3212 includes the following monitoring/testing/recordkeeping/reporting requirements:

- 6.2.1. Monitor the dry gas throughput to the dehydration system (DH-01) on a monthly basis.
- 6.2.2. Measure dehydrator operating parameters at least once quarterly with the exception of natural gas flowrate, maximum design capacity, and wet gas composition.
- 6.3.1. Sample the composition of the wet natural gas within 180 days of permit issuance or within 180 days of startup of the glycol dehydration unit, whichever is later.
- 6.4.1. Maintain a record of the dry natural gas throughput through the glycol dehydration unit/still column (DH-01)
- 6.4.2. Maintain records of all monitoring data, wet gas sampling, and annual GRI-GLYCalc emission estimates.
Records shall be maintained for a period of five (5) years on site or in a readily accessible off-site location

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		BLR-01 (16E)	
Emission unit ID number: BLR-01 (16E)	Emission unit name: Dehydrator - Reboiler 01	List any control devices associated with this emission unit: na	
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): 0.20 MMBtu/Hr Triethylene Glycol (TEG) Dehydrator Reboiler. The glycol dehydrator (and associated reboiler) is used to dehydrate a portion of the inlet gas coming into the facility from the Lucey line.			
Manufacturer: na	Model number: na	Serial number(s): na	
Construction date: na	Installation date: 2011	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 0.20 MMBtu/hr (LHV)			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hrs/yr	
<i>Fuel Usage Data (fill out all applicable fields)</i>			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 0.20 MMBtu/hr (LHV)		Type and Btu/hr rating of burners: 0.20 MMBtu/hr (LHV)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. na			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)

<i>Emission Data</i>		BLR-01 (16E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	0.02	0.08	
Nitrogen Oxides (NOX)	0.02	0.10	
Lead (Pb)	---	---	
Particulate Matter (PM2.5)	1.7E-03	0.01	
Particulate Matter (PM10)	1.7E-03	0.01	
Total Particulate Matter (TSP)	1.7E-03	0.01	
Sulfur Dioxide (SO2)	1.3E-04	5.7E-04	
Volatile Organic Compounds (VOC)	1.2E-03	0.01	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	4.6E-07	2.0E-06	
Ethylbenzene	---	---	
Formaldehyde (HCHO)	1.6E-05	7.1E-05	
n-Hexane	3.9E-04	1.7E-03	
Toluene	7.4E-07	3.2E-06	
2,2,4-Trimethylpentane	---	---	
Xylenes	---	---	
Other HAP	4.1E-07	1.8E-06	
Total HAP	4.1E-04	1.8E-03	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	25.94	113.61	
Methane (CH4)	4.9E-04	2.1E-03	
Nitrous Oxide (N2O)	4.9E-05	2.1E-04	
CO2 Equivalent (CO2e)	25.97	113.73	
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.). AP-42			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-3212 includes the following dehydration reboiler (BLR-01) Limitations and Standards:

- 5.1.1. The maximum design heat input for the Reboiler (BLR-01) shall not exceed 0.20 MMBTU/hr
- 5.1.2. Opacity shall not exceed 10% based on a 6-min block average. [45CSR§2-3.1.]

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-3212 includes the following monitoring/testing/recordkeeping/reporting requirements:

- 5.2.1. Compliance with the visible emission requirements as per 40 CFR Part 60, Appendix A, Method 9. [45CSR§2-3.2.]
- 5.4.1. Maintain records of each visible emissions check.
- 5.5.1. Report violations of Method 9 opacity as soon as practicable, but within 10 days of the occurrence.

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the Schedule of Compliance Form as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		FL-01 (17E)	
Emission unit ID number: FL-01 (17E)	Emission unit name: Old Process Flare 01	List any control devices associated with this emission unit: na	
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): 240 MMBtu/hr, 98% Control Efficient; Non-Assisted Process Flare. The old process flare (FL-01) is used to combust natural gas and NGL released from numerous sources and it is estimated up to 5 MMscf/yr will be combusted over the course of a year.			
Manufacturer: TCI USA, Inc	Model number: 4800	Serial number(s): na	
Construction date: na	Installation date: 2012	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 240 MMBtu/hr (HHV)			
Maximum Hourly Throughput: 571 scf/hr (ave)	Maximum Annual Throughput: 5.0 MMscf/yr	Maximum Operating Schedule: 8,760 hrs/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> _X_Yes <input type="checkbox"/> _No (Pilot Gas and Waste Gas)		If yes, is it? <input type="checkbox"/> _Indirect Fired <input checked="" type="checkbox"/> _X_Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 240 MMBtu/hr (HHV)		Type and Btu/hr rating of burners: 240 MMBtu/hr (HHV)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas for the Pilot and Purge is Included in the Total Heat Input			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas (Pilot)	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)
Waste Gas	0.25 grains/100 scf	negligible	1,012 Btu/scf (LHV)
na			

<i>Emission Data</i>		FL-01 (17E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	88.80	1.04	
Nitrogen Oxides (NOX)	16.32	0.19	
Lead (Pb)	---	---	
Particulate Matter (PM2.5)	1.79	0.02	
Particulate Matter (PM10)	1.79	0.02	
Total Particulate Matter (TSP)	1.79	0.02	
Sulfur Dioxide (SO2)	0.14	1.7E-03	
Volatile Organic Compounds (VOC)	7.47	0.09	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	0.21	0.00	
Ethylbenzene	0.21	0.00	
Formaldehyde (HCHO)	---	---	
n-Hexane	0.21	0.00	
Toluene	0.21	0.00	
2,2,4-Trimethylpentane	---	---	
Xylenes	0.21	0.00	
Other HAP	---	---	
Total HAP	1.07	0.01	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	28,962.97	339.41	
Methane (CH4)	180.37	2.11	
Nitrous Oxide (N2O)	1.4E-04	0.00	
CO2 Equivalent (CO2e)	33,472.34	392.44	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>Mass Balance (@ 98% Control Efficiency) and AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following flare (FL-01) limitations and standards:

7.1.1. Quantity of flare gas that shall be consumed in the flare shall not exceed 5 MMscf/yr.

7.1.2. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
FL-01	VOC	7.47	0.09
	NOX	16.32	0.19
	CO	88.80	1.04
	PM10	1.79	0.02

7.1.3.a. Flare shall be non-assisted.

7.1.3.b. Flare shall be designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

7.1.3.c. Flare shall be operated, with a flame present at all times whenever emissions may be vented to it

7.1.3.d. Flare shall be used only when the net heating value of the gas \geq 300 Btu/scf.

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

7.2.1 Monitor the presence or absence of a flare pilot flame using a thermocouple or any other equivalent device.

7.2.2 Monitor the throughput to the flare on a monthly basis.

7.3.1 Conduct Method 22 opacity test whenever required by the Director.

7.4.1 Maintain records of the times and duration of all periods which the pilot flame was absent.

7.4.2 Maintain a record of the flare design evaluation.

7.4.3 Maintain records of any visible emission opacity tests conducted.

7.4.5 Maintain a monthly record of the waste gas throughput to the flare.

7.5.2 Report deviation(s) from allowable visible emission requirement w/in 10 days of occurrence.

7.5.3 Report deviation(s) from the flare design and operation criteria w/in 10 days of discovery.

7.5.4 Report the whenever the flare was used for an emergency.

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the Schedule of Compliance Form as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		FL-02 (18E)	
Emission unit ID number: FL-02 (18E)	Emission unit name: New Process Flare 02	List any control devices associated with this emission unit: na	
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): 541.91 MMBtu/hr, 98% Control Efficient; Elevated (190'), Air-Assist, Process Flare. The new process flare (FL-02) will be used to combust natural gas and NGL released from numerous sources and it is estimated up to 59.2 MMscf/yr will be combusted over the course of a year. The new process flare (FL-02) will also be used to control emissions in the event of an upset.			
Manufacturer: Zeeco	Model number: AFTA-20/56	Serial number(s): na	
Construction date: na	Installation date: tbd	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 541.91 MMBtu/hr (HHV)			
Maximum Hourly Throughput: 6,754.28 scf/hr (ave)	Maximum Annual Throughput: 59.21 MMscf/yr	Maximum Operating Schedule: 8,760 hrs/yr	
Fuel Usage Data (fill out all applicable fields)			
Does this emission unit combust fuel? <input checked="" type="checkbox"/> _X_Yes <input type="checkbox"/> _No (Pilot Gas and Waste Gas)		If yes, is it? <input type="checkbox"/> _Indirect Fired <input checked="" type="checkbox"/> _X_Direct Fired	
Maximum design heat input and/or maximum horsepower rating: 541.91 MMBtu/hr (HHV)		Type and Btu/hr rating of burners: 541.91 MMBtu/hr (HHV)	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas for the Pilot and Purge is Included in the Total Heat Input			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas (Pilot)	0.25 grains/100 scf	negligible	920 Btu/scf (LHV)
Waste Gas	0.25 grains/100 scf	negligible	1,146 Btu/scf (LHV)
na			

<i>Emission Data</i>		FL-02 (18E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	200.51	13.94	
Nitrogen Oxides (NOX)	36.85	2.56	
Lead (Pb)	---	---	
Particulate Matter (PM2.5)	4.04	0.28	
Particulate Matter (PM10)	4.04	0.28	
Total Particulate Matter (TSP)	4.04	0.28	
Sulfur Dioxide (SO2)	0.32	2.2E-02	
Volatile Organic Compounds (VOC)	127.79	8.88	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	4.26	0.30	
Ethylbenzene	4.26	0.30	
Formaldehyde (HCHO)	---	---	
n-Hexane	4.26	0.30	
Toluene	4.26	0.30	
2,2,4-Trimethylpentane	---	---	
Xylenes	4.26	0.30	
Other HAP	---	---	
Total HAP	21.30	1.48	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	66,720.17	4,637.03	
Methane (CH4)	298.17	20.72	
Nitrous Oxide (N2O)	1.9E-03	0.01	
CO2 Equivalent (CO2e)	74,174.87	5,157.56	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>Mass Balance (@ 98% Control Efficiency) and AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following flare (FL-02) limitations and standards:

- 8.1.1. Quantity of flare gas that shall be consumed in the flare shall not exceed 59.12 MMscf/yr.
- 8.1.2. Emissions shall not exceed the following:

Unit ID	Pollutant	lb/hr	tpy
FL-02	VOC	127.79	8.88
	NOX	36.85	2.56
	CO	200.51	13.94
	PM10	4.04	0.28

- 8.1.3.a. Flare shall be air-assisted.
- 8.1.3.b. Flare shall be designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.
- 8.1.3.c. Flare shall be operated, with a flame present at all times whenever emissions may be vented to it
- 8.1.3.d. Flare shall be used only when the net heating value of the gas \geq 300 Btu/scf.
- 8.1.7 Flare designed, operated and maintained to prevent emission of objectionable odors. [45CSR§6-4.6.]

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

- 8.2.1 Monitor the presence or absence of a flare pilot flame using a thermocouple or any other equivalent device.
- 8.2.2 Monitor the throughput to the flare on a monthly basis.
- 8.3.1 Conduct Method 22 opacity test w/in 1 year of permit issuance or initial startup, whichever is later.
- 8.4.1 Maintain records of the times and duration of all periods which the pilot flame was absent.
- 8.4.2 Maintain a record of the flare design evaluation.
- 8.4.3 Maintain records of any visible emission opacity tests conducted.
- 8.4.5 Maintain a monthly record of the waste gas throughput to the flare.
- 8.5.2 Report deviation(s) from allowable visible emission requirement w/in 10 days of occurrence.
- 8.5.3 Report deviation(s) from the flare design and operation criteria w/in 10 days of discovery.

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the Schedule of Compliance Form as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description			TLO (20E)	
Emission unit ID number: TLO (20E)	Emission unit name: Produced Water Truck Load-Out	List any control devices associated with this emission unit: na		
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): 600,000 bbl/yr Produced H2O/Oil Loaded into Trucks for Off-site Shipment.				
Manufacturer: na	Model number: na	Serial number(s): na		
Construction date: na	Installation date: 2011	Modification date(s): na		
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): na				
Maximum Hourly Throughput: 69,000 gal/hr NGL	Maximum Annual Throughput: 25,185,000 gal/yr NGL	Maximum Operating Schedule: 8,760		
Fuel Usage Data (fill out all applicable fields)				
Does this emission unit combust fuel? ___Yes ___X_No		If yes, is it? na ___ Indirect Fired ___Direct Fired		
Maximum design heat input and/or maximum horsepower rating: na		Type and Btu/hr rating of burners: na		
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. na				
Describe each fuel expected to be used during the term of the permit.				
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value	
na				

<i>Emission Data</i>		TLO (20E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	---	---	
Nitrogen Oxides (NOX)	---	---	
Lead (Pb)	---	---	
Particulate Matter (PM2.5)	---	---	
Particulate Matter (PM10)	---	---	
Total Particulate Matter (TSP)	---	---	
Sulfur Dioxide (SO2)	---	---	
Volatile Organic Compounds (VOC)	---	1.96	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	---	0.10	
Ethylbenzene	---	0.10	
Formaldehyde (HCHO)	---	---	
n-Hexane	---	0.10	
Toluene	---	0.10	
2,2,4-Trimethylpentane	---	---	
Xylenes	---	0.10	
Other HAP	---	---	
Total HAP	---	0.49	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	---	---	
Methane (CH4)	---	---	
Nitrous Oxide (N2O)	---	---	
CO2 Equivalent (CO2e)	---	---	
List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).			
na			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following truck load (TLO) limitations and standards:

- 9.1.1. The maximum liquid throughput to the Produced Water Loading (TLO) shall not exceed 69,000 gal/day and 25,185,000 gal/yr.
- 9.1.2. The Produced Water Loading (TLO) shall be operated in accordance with the plans and specifications filed in Permit Application R13-2826H. The system will employ splash loading.

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

- 9.2.1. Maintain records of the amount of produced water loaded.

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the Schedule of Compliance Form as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		T-03 (22E) and T-04 (23E)	
Emission unit ID number: T-03 (22E) and T-04 (23E)	Emission unit name: 400 bbl Produced H2O/Oil (Each) Storage Tanks T-03 and T-04	List any control devices associated with this emission unit: na	
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): Two (2) 400 bbl Produced H2O/Oil Storage Tanks. There are numerous other tanks at the facility used to store various materials such as waste water, condensate, NGLs, lube oil, glycol, etc; however, all other storage tanks at the site have de-minimis emissions. Note there are no emissions from the fourteen (14) pressure vessels during normal operation.			
Manufacturer: na	Model number: na	Serial number(s): na	
Construction date: na	Installation date: 2011	Modification date(s): na	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 400 bbl (22E and 23E) capacity, 200,000 bbl/yr throughput (ea)			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hrs/yr	
<i>Fuel Usage Data (fill out all applicable fields)</i>			
Does this emission unit combust fuel? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes, is it? <input type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired	
Maximum design heat input and/or maximum horsepower rating: na		Type and Btu/hr rating of burners: na	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. na			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
na			

<i>Emission Data</i>		T-03 (22E) and T-04 (23E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	---	---	
Nitrogen Oxides (NOX)	---	---	
Lead (Pb)	---	---	
Particulate Matter (PM2.5)	---	---	
Particulate Matter (PM10)	---	---	
Total Particulate Matter (TSP)	---	---	
Sulfur Dioxide (SO2)	---	---	
Volatile Organic Compounds (VOC)	0.46	2.03	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	0.02	0.10	
Ethylbenzene	0.02	0.10	
Formaldehyde (HCHO)	---	---	
n-Hexane	0.02	0.10	
Toluene	0.02	0.10	
2,2,4-Trimethylpentane	---	---	
Xylenes	0.02	0.10	
Other HAP	---	---	
Total HAP	0.10	0.51	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	---	---	
Methane (CH4)	---	---	
Nitrous Oxide (N2O)	---	---	
CO2 Equivalent (CO2e)	---	---	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following produced water tanks (T-03 and T-04) limitations and standards:

9.1.3. The maximum annual throughput of produced water to the 400 bbl (22E and 23E) storage tanks shall not exceed the following:

Storage Tank ID	Product Stored	Maximum Annual Throughput (gal/yr)
T-03	Produced Water	8,400,000
T-04	Produced Water	8,400,000

9.1.4. No later than ten (10) months after the issuance of this permit, the meter prover storage tank (T-01) shall cease operations and be permanently disconnected.

9.1.5. No later than ten (10) months after the issuance of this permit, the service of the 880 storage tank (T-02) shall change from hydrocarbon condensate to waste water.

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements:

9.2.2. Maintain records of the amount of produced water throughput to the storage tanks

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the Schedule of Compliance Form as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

<i>Emission Unit Description</i>		FUG (21E)	
Emission unit ID number: FUG (21E)	Emission unit name: Fugitive Emissions from Piping, Valves, Fittings, Etc (TXP1, TXP2, and TXP3)	List any control devices associated with this emission unit: na	
Provide a description of the emissions unit (type, Method of operation, design parameters, etc.): Fugitive emissions from valves, flanges, connectors, relief valves, and pump seals. (TXP1 and TXP2 are subject to NSPS KKK) (Inlet and TXP3 are subject to NSPS OOOO)			
Manufacturer: na	Model number: na	Serial number(s): na	
Construction date: na	Installation date: 2011	Modification date(s): 2012, 2013	
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): na			
Maximum Hourly Throughput: na	Maximum Annual Throughput: na	Maximum Operating Schedule: 8,760 hrs/yr	
<i>Fuel Usage Data (fill out all applicable fields)</i>			
Does this emission unit combust fuel? ___ Yes <u>X</u> No		If yes, is it? ___ Indirect Fired ___ Direct Fired	
Maximum design heat input and/or maximum horsepower rating: na		Type and Btu/hr rating of burners: na	
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.			
Describe each fuel expected to be used during the term of the permit.			
Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
na			

<i>Emission Data</i>		FUG (21E)	
Criteria Pollutants	Pollutant Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	---	---	
Nitrogen Oxides (NOX)	---	---	
Lead (Pb)	---	---	
Particulate Matter (PM2.5)	---	---	
Particulate Matter (PM10)	---	---	
Total Particulate Matter (TSP)	---	---	
Sulfur Dioxide (SO2)	---	---	
Volatile Organic Compounds (VOC)	13.39	58.67	
Hazardous Air Pollutants	Pollutant Emissions		
	PPH	TPY	
Benzene	0.32	1.41	
Ethylbenzene	0.32	1.41	
Formaldehyde (HCHO)	---	---	
n-Hexane	0.32	1.41	
Toluene	0.32	1.41	
2,2,4-Trimethylpentane	---	---	
Xylenes	0.32	1.41	
Other HAP	---	---	
Total HAP	0.45	1.99	
Regulated Pollutants other than Criteria and HAP	Pollutant Emissions		
	PPH	TPY	
Carbon Dioxide (CO2)	0.18	0.80	
Methane (CH4)	15.42	67.54	
Nitrous Oxide (N2O)	---	---	
CO2 Equivalent (CO2e)	385.66	1,689.18	
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>AP-42</p>			

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit R13-2826H includes the following TXP1 and TXP2 limitations and standards:

- 10.1.2.(a). Comply with the requirements of §60.482-1 (a), (b), and (d) and 60.482-2 through 60.482-10, except as provided in §60.633, as soon as practicable, but no later than 180 days after initial startup.
- 10.1.2.(d). Comply with provisions of §60.485 except as provided in §60.633(f) of this subpart.
- 10.1.2.(e). Comply with provisions of §60.486 and 60.487 except as provided in §§60.633, 60.635 and 60.636.
- 10.1.2.(f). Each piece of equipment is presumed to be in VOC service or in wet gas service.
[40 C.F.R. § 60.632]

Permit R13-2826H includes the following Inlet and TXP3 limitations and standards:

- 11.1.3.(a). Comply with §60.482-1a(a), (b) and (d), 60.482-2a, and 60.482-4a through 60.482-11a, in addition to requirements of §60.487a(a), (b), (c)(2)(i) through (iv), and (c)(2)(vii) through (viii)..
- 11.1.3.(d). Comply with §60.485a.
- 11.1.3.(e). Comply with §§60.486a and 60.487a except as provided in §§60.5401, 60.5421, and 60.5422
- 11.1.3.(f). Comply with §60.486a and 60.487a of this part.

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements for TXP1 and TXP2:

- 10.2.1. Comply with recordkeeping requirements of §60.633(b)(1) and (f) in addition to requirements of §60.486.
- 10.2.2. Comply with semiannual reporting requirements of §60.633(b) in addition to requirements of §60.487.

Permit R13-2826H includes the following monitoring/testing/recordkeeping/reporting requirements for Inlet and TXP3:

- 11.2.1. Comply with § 60.5400.
- 11.4.2. Comply with recordkeeping requirements of §60.5401(b)(1) in addition to requirements of §60.486.
- 11.4.3. Comply with the semiannual reporting requirements §60.487a(c)(2) through (vi).

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT F
Compliance Schedule
(Not Applicable)

For each emission unit not in compliance with an applicable requirement, fill out a Schedule of Compliance Form as ATTACHMENT F.

ATTACHMENT F - Schedule of Compliance Form

Complete this section if you indicated noncompliance with any of the applicable requirements identified in the permit application. For each emission unit which is not in compliance, identify the applicable requirement, the reason(s) for noncompliance, a description of how the source will achieve compliance, and a detailed schedule of compliance. If there is a consent order that applies to this requirement, attach a copy to this form.

1. Applicable Requirement:

na

Units:

na

Applicable Requirement:

na

NOT APPLICABLE

2. Reason for Noncompliance:

na

3. How will Compliance be Achieved?:

na

4. Consent Order Number (if applicable):

na

5. Schedule of Compliance. Provide a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance, including a date for final compliance.

na

Remedial Measure or Action	Date to be Achieved
na	na

6. Submittal of Progress Reports.

na

Content of Progress Report:

na

Report starting date:

na

Submittal frequency:

na

ATTACHMENT G

Air Pollution Control Devices (APCD) Forms

For each control device listed in the Title V Equipment Table, fill out and provide an Air Pollution Control Device Form as ATTACHMENT G.

- NSCR for CE-01 225 bhp CAT G342NA Engine (01-NSCR)
 - NSCR for CE-02 625 bhp CAT G398TA (02 NSCR)
 - OxCat for CE-03 thru CE-05 3,550 bhp CAT G3612LE Engines (01-OxCat thru 03-OxCat)
 - 5.0 MMscf/yr Old Process Flare (FL-01 (17E))
 - 59.2 MMscf/yr New Process Flare (FL-02 (18E))
-

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: 01-NSCR	List all emission units associated with this control device. CE-01 (1E)
---	---

Manufacturer: EMIT Technologies	Model number: EAS-1700T -0606F-22CEE	Installation date: 2010
---	--	-----------------------------------

Type of Air Pollution Control Device:

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multicyclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) NSCR
<input type="checkbox"/> Wet Plate Electrostatic Precipitator	<input type="checkbox"/> Dry Plate Electrostatic Precipitator	

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutants	Capture Efficiency	Control Efficiency
NOx	100.0%	99.2%
CO	100.0%	85.4%
VOC	100.0%	25.3%
Benzene	---	---
Ethylbenzene	---	---
HCHO	100.0%	76.0%
n-Hexane	---	---
Toluene	---	---
Xylenes	---	---
Total HAP	100.0%	63.3%
CH4	---	---
CO2e	---	---

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

NSCR control device is fitted with a closed-loop, automatic air/fuel ratio controller (AFRC). The closed-loop, AFRC controls a fuel metering valve to deliver additional fuel when required to ensure a fuel-rich mixture and a resultant exhaust oxygen content of less than or equal to 0.5%. The AFRC also incorporates dual-point exhaust gas temperature and oxygen sensors which provide temperature and exhaust oxygen content differential feedback.

Is this device subject to the CAM requirements of 40 C.F.R. 64? Yes No
If Yes, Complete ATTACHMENT H
If No, Provide justification.
 Reference ATTACHMENT H - Not required at a nonmajor source.

Describe the parameters monitored and/or methods used to indicate performance of this control device.
 Exhaust gas temperature and oxygen content are monitored.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: 02-NSCR	List all emission units associated with this control device. CE-02 (2E)
---	---

Manufacturer: EMIT Technologies	Model number: EAS-2500T -0808F-21 CEE	Installation date: 2010
---	---	-----------------------------------

Type of Air Pollution Control Device:

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multicyclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) NSCR
<input type="checkbox"/> Wet Plate Electrostatic Precipitator	<input type="checkbox"/> Dry Plate Electrostatic Precipitator	

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutants	Capture Efficiency	Control Efficiency
NOx	100.0%	94.9%
CO	100.0%	95.3%
VOC	100.0%	78.7%
Benzene	---	---
Ethylbenzene	---	---
HCHO	100.0%	76.0%
n-Hexane	---	---
Toluene	---	---
Xylenes	---	---
Total HAP	100.0%	77.3%
CH4	---	---
CO2e	---	---

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

NSCR control device is fitted with a closed-loop, automatic air/fuel ratio controller (AFRC). The closed-loop, AFRC controls a fuel metering valve to deliver additional fuel when required to ensure a fuel-rich mixture and a resultant exhaust oxygen content of less than or equal to 0.5%. The AFRC also incorporates dual-point exhaust gas temperature and oxygen sensors which provide temperature and exhaust oxygen content differential feedback.

Is this device subject to the CAM requirements of 40 C.F.R. 64? Yes No
If Yes, Complete ATTACHMENT H
If No, Provide justification.
 Reference ATTACHMENT H - Not required at a nonmajor source.

Describe the parameters monitored and/or methods used to indicate performance of this control device.
 Exhaust gas temperature and oxygen content are monitored.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: 03-OxCat thru 05-OxCat (Each)	List all emission units associated with this control device. CE-03 (3E) thru CE-05 (5E) (Each)
---	--

Manufacturer: EMIT Technologies	Model number: ELH-5000Z-1820F-43CEE-36	Installation date: 2010
---	--	-----------------------------------

Type of Air Pollution Control Device:

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multicyclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) OxCat
<input type="checkbox"/> Wet Plate Electrostatic Precipitator	<input type="checkbox"/> Dry Plate Electrostatic Precipitator	

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutants	Capture Efficiency	Control Efficiency
NOx	---	---
CO	100.0%	90.0%
VOC	100.0%	60.0%
Benzene	---	---
Ethylbenzene	---	---
HCHO	100.0%	85.0%
n-Hexane	---	---
Toluene	---	---
Xylenes	---	---
Total HAP	100.0%	78.1%
CH4	---	---
CO2e	---	---

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).
 The OxCat is fitted with a closed-loop automatic feedback controller to ensure emissions of regulated pollutants do not exceed allowable emission limits. The automatic air/fuel ratio controller (AFRC) or closed-loop automatic feedback controller provides a warning or indication to the operator and/or is interlocked with the engine ignition system to cease engine operation in case of a masking, poisoning or overrich air/fuel ratio situation which results in performance degradation or failure of the catalyst element.

Is this device subject to the CAM requirements of 40 C.F.R. 64? Yes No
If Yes, Complete ATTACHMENT H
If No, Provide justification.
 Reference ATTACHMENT H - Not required at a nonmajor source.

Describe the parameters monitored and/or methods used to indicate performance of this control device.
 Exhaust gas temperature and oxygen content are monitored.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: FL-01 (17E)	List all emission units associated with this control device. Primarily natural gas released during general maintenance activities, plus upsets.
---	---

Manufacturer: TCI USA, Inc	Model number: 4800	Installation date: 2012
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Type of Air Pollution Control Device:

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multicyclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input checked="" type="checkbox"/> Flare	<input type="checkbox"/> Other (describe) _____
<input type="checkbox"/> Wet Plate Electrostatic Precipitator		<input type="checkbox"/> Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutants	Capture Efficiency	Control Efficiency
NOx	---	---
CO	---	---
VOC	100.0%	98.0%
Benzene	100.0%	98.0%
Ethylbenzene	100.0%	98.0%
HCHO	---	---
n-Hexane	100.0%	98.0%
Toluene	100.0%	98.0%
Xylenes	100.0%	98.0%
Total HAP	100.0%	98.0%
CH4	100.0%	98.0%
CO2e	---	---

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).
Non-assisted open flame flare.

Is this device subject to the CAM requirements of 40 C.F.R. 64? Yes No
If Yes, Complete ATTACHMENT H
If No, Provide justification.
 Reference ATTACHMENT H - Not required at a nonmajor source.

Describe the parameters monitored and/or methods used to indicate performance of this control device.
 Thermocouple (or equivalent) used to monitor presence of pilot flame.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: FL-02 (18E)	List all emission units associated with this control device. Natural gas and NGL released from numerous sources, plus upsets.
---	---

Manufacturer: Zeeco	Model number: AFTA-20/56	Installation date: TBD
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Type of Air Pollution Control Device:

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multicyclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input checked="" type="checkbox"/> Flare	<input type="checkbox"/> Other (describe) _____
<input type="checkbox"/> Wet Plate Electrostatic Precipitator		<input type="checkbox"/> Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutants	Capture Efficiency	Control Efficiency
NOx	---	---
CO	---	---
VOC	100.0%	98.0%
Benzene	100.0%	98.0%
Ethylbenzene	100.0%	98.0%
HCHO	---	---
n-Hexane	100.0%	98.0%
Toluene	100.0%	98.0%
Xylenes	100.0%	98.0%
Total HAP	100.0%	98.0%
CH4	100.0%	98.0%
CO2e	---	---

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).
Air-assisted open flame flare.

Is this device subject to the CAM requirements of 40 C.F.R. 64? Yes No
If Yes, Complete ATTACHMENT H
If No, Provide justification.
 Reference ATTACHMENT H - Not required at a nonmajor source.

Describe the parameters monitored and/or methods used to indicate performance of this control device.
 Thermocouple (or equivalent) used to monitor presence of pilot flame.

ATTACHMENT H
Compliance Assurance Monitoring (CAM)
(Not Applicable)

Fill out and provide Compliance Assurance Monitoring (CAM) Form(s), if applicable, for each Pollutant Specific Emission Unit (PSEU) as ATTACHMENT H.

ATTACHMENT H - Compliance Assurance Monitoring (CAM) Plan Form

For definitions and information about the CAM rule, please refer to 40 CFR Part 64. Additional information (including guidance documents) may also be found at <http://www.epa.gov/ttn/emc/cam.html>

CAM APPLICABILITY DETERMINATION

1) Does the facility have a PSEU (Pollutant-Specific Emissions Unit) considered separately with respect to **EACH** regulated air pollutant that is subject to CAM (40 CFR Part 64), which must be addressed in this CAM plan submittal? YES NO
To determine applicability, a PSEU must meet **all** of the following criteria.
(If No, then the remainder of this form need not be completed):

- a. The PSEU is located at a major source that is required to obtain a Title V permit;
- b. The PSEU is subject to an emission limitation or standard for the applicable regulated air pollutant that is **NOT** exempt;
LIST OF EXEMPT EMISSION LIMITATIONS OR STANDARDS:
 - NSPS (40 CFR Part 60) or NESHAP (40 CFR Parts 61 and 63) proposed after 11/15/1990.
 - Stratospheric Ozone Protection Requirements.
 - Acid Rain Program Requirements.
 - Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR §64.1.
 - An emission cap that meets the requirements specified in 40 CFR §70.4(b)(12).
- c. The PSEU uses an add-on control device (as defined in 40 CFR §64.1) to achieve compliance with an emission limitation or standard;
- d. The PSEU has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than the Title V Major Source Threshold Levels; AND
- e. The PSEU is **NOT** an exempt backup utility power emissions unit that is municipally-owned.

NOT APPLICABLE

Continued - If Applicable

SUPPLEMENT 01

Process Description

- A. Project Overview
 - B. Cryogenic Process (Fugitives) (FUG (21E))
 - C. Compressor Engines (CE-01 (1E) thru CE-05 (5E))
 - D. Startup/Shutdown/Maintenance (including Blowdown) (SSM (6E))
 - E. Compressor Rod Packing and Engine Crankcase Leaks (RPC (7E))
 - F. Emergency Generator Engine (GE (8E))
 - G. Heaters (H-01 (9E) thru H-06 (14E))
 - H. Triethylene Glycol (TEG) Dehydrator (DH-01 (15E) and BLR-01 (16E))
 - I. Process Flares (FL-01 (17E) and -02 (18E))
 - J. Truck Load-Out (TLO (20E))
 - K. Storage Tanks (T-03 (22E) and T-04 (23E))
-

SUPPLEMENT 01
Process Description

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
Application for Title V Operating Permit (45CSR30)

A. Project Overview

Williams Ohio Valley Midstream LLC owns and operates the Fort Beeler Gas Processing Plant (facility) located along US Route 250 in Marshall County (See Appendix B – Site Location Map). The facility currently receives natural gas from local production wells and processes this gas through cryogenic processes, removing natural gas liquids from the Inlet Gas. The facility operates under Permit R13-2826G. The facility has the capacity to process 520 MMscfd of raw natural gas through one (1) 120 MMscfd cryogenic turboexpansion plant (TXP1) and two (2) 200 MMscfd cryogenic turboexpansion plants (TXP2 and TXP3).

B. Cryogenic Process (Fugitives) (FUG (21E))

The cryogenic process utilizes an expansion turbine to drop the temperature of the Inlet Gas to approximately minus 120 degrees Fahrenheit. This rapid temperature drop condenses much of the ethane (C₂H₆) and most of the other hydrocarbons (primarily propane (C₃H₈) and butane (C₄H₁₀), with de-minimis hexane, benzene, toluene, ethyl-benzene, xylene, etc. (together C₅+)), while maintaining methane (CH₄) in gaseous form.

As this is a totally enclosed system, the only emissions are fugitives from piping and equipment. These emissions are controlled by implementation of a leak detection and repair (LDAR) program. Affected sources are identified herein as Source FUG.

C. Compressor Engines (CE-01 (1E) thru CE-05 (5E))

Five (5) natural gas-fueled compressor engines are utilized in the plant processes. Each of these engines is equipped with emission control technology applicable to the operation. The rich-burn engines (CE-01 and CE-02) utilize non-selective catalytic reduction (NSCR) and the lean-burn engines (CE-03 thru CE-05) utilize catalytic oxidation (i.e., oxidation catalyst or OxCat).

D. Startup/Shutdown/Maintenance (including Blowdown) (SSM (6E))

Start/Stop/Maintenance (SSM) emissions are the sum of unburned fuel resulting from "cold-start" of idle gas-fired engines and natural gas that is purged (aka blowdown) from the compressors and associated piping and equipment. The blowdown gas from the compressors driven by electric motors is routed to the Old Process Flare (FL-01).

E. Compressor Rod Packing and Engine Crankcase Leaks (RPC (7E))

Compressor rod packing leaks gas from the wear of mechanical joints, seals, and rotating surfaces over time. Similarly, exhaust gases leak from the crankcases of reciprocating engines.

F. Emergency Generator Engine (GE (8E))

One (1) emergency generator engine will be used to provide electrical power for various activities at the site in the event of loss of purchase power. The emergency generator engine will burn either natural gas or propane fuel.

G. Heaters (H-01 (9E) thru H-06 (14E))

Six (6) natural gas-fueled heaters are used at the facility. The regen heaters (H-02 thru H-04) are used to regenerate the mole-sieves necessary to further dry the inlet gas and the hot oil heater (H-01) and heat medium heaters (H-05 and H-06) are used on the NGL de-methanizers.

H. Triethylene Glycol (TEG) Dehydrator (DH-01 (15E) and BLR-01 (16E))

One (1) glycol dehydrator (and associated reboiler) is used to dehydrate a portion of the inlet gas coming into the facility from the Lucey line.

I. Process Flares (FL-01 (17E) and -02 (18E))

Two process flares are used at the facility to safely combust natural gas and NGL during routine operation. The old process flare (FL-01) will primarily be used to combust natural gas released during general maintenance activities (e.g., blowdowns of the six electrically driven residue gas compressors) and it is estimated that up to 5.0 MMscf/yr will be combusted during these routine events. The old process flare (FL-01) will also be used to control emissions in the event of an upset.

The new process flare (FL-02) will be used to combust natural gas and NGL released from numerous sources and it is estimated up to 59.2 MMscf/yr will be combusted over the course of a year. During normal operating conditions, gas sent to the new flare (FL-02) will be associated with maintenance activities. The top five non-emergency streams routed to the vents to the new process flare (FL-02) include the TXP1 Inlet Gas Separator (V-410), TXP2 Product Surge Tank (V-2404), TXP1 Product Surge Tank (V-404), TXP1 Cold Separator (V-402) and TXP1 Inlet Filter/Coalescer (F-441). The new process flare (FL-02) will also be used to control emissions in the event of an upset.

The amount of gas routed to each flare during a given event will vary widely and combustion is anticipated to be a minimum of 98% efficient.

J. Truck Load-Out (TLO (20E))

There are emissions from the truck loading of produced water/oil (TLO). Loading of NGLs will be accomplished under pressure resulting in no emissions to the atmosphere.

K. Storage Tanks (T-03 (22E) and T-04 (23E))

There are numerous tanks at the facility used to store various materials such as produced water, condensate, NGLs, lube oil, glycol, etc. The only storage tanks with significant emissions to the atmosphere are the produced water tanks (T-03 and T-04). All other storage tanks at the site have de-minimis emissions. Note there are no emissions from the fourteen (14) pressure vessels during normal operation.

SUPPLEMENT 02

Regulatory Discussion

A. Applicability of New Source Review (NSR) Regulations

1. Prevention of Significant Deterioration (PSD)
2. Nonattainment New Source Review (NNSR)
3. Hazardous Air Pollutants (HAPs)
4. Title V Operating Permits (TVOP)

B. Applicability of Federal Regulations

1. NSPS Dc – Steam Generating Units
2. NSPS Kb – Volatile Organic Liquid Storage Vessels
3. NSPS GG – Stationary Gas Turbines
4. NSPS KKK – Leaks from Natural Gas Processing Plants
5. NSPS LLL – Onshore Natural Gas Processing: SO₂ Emissions
6. NSPS IIII – Compression Ignition Reciprocating Internal Combustion Engines (RICE)
7. NSPS JJJJ – Stationary Spark Ignition (SI) Internal Combustion Engines (ICE)
8. NSPS KKKK – Stationary Combustion Turbines
9. NSPS OOOO – Oil and Natural Gas Production, Transmission and Distribution
10. NESHAP HH – Oil and Natural Gas Production Facilities
11. NESHAP HHH – Natural Gas Transmission and Storage Facilities
12. NESHAP YYYY – Stationary Combustion Turbines
13. NESHAP ZZZZ – Stationary Reciprocating Internal Combustion Engines (RICE)
14. NESHAP DDDDD – Industrial-Commercial-Institutional Boilers and Process Heaters
15. NESHAP JJJJJ – Industrial-Commercial-Institutional Boilers and Process Heaters
16. RMP – Chemical Accident Prevention (and Risk Management Plan)
17. CAM – Compliance Assurance Monitoring
18. GHG – Mandatory Greenhouse Gases (GHG) Reporting

C. Applicability of Sources Aggregation

D. Applicability of State Regulations

1. Particulate Air Pollution from Combustion of Fuel
2. Prevent and Control of Objectionable Odors
3. Control of Air Pollution from Combustion of Refuse
4. Prevention and Control of Air Pollution – Sulfur Oxides
5. Permits for Construction, Modification, Relocation and Operation
6. Permits for Construction and Major Modifications of Major Sources
7. Standards of Performance for New Stationary Sources (40 CFR Part 60)
8. Permits for Construction and Modification (Nonattainment)
9. Regulation of Volatile Organic Compounds (VOC)
10. Air Quality Management Fees Program
11. Prevent and Control Emissions of Toxic Air Pollutants
12. Air Pollution Emissions Banking and Trading
13. Emission Statements for VOC and NO_x
14. Requirements for Operating Permits
15. Emission Standards for Hazardous Air Pollutants (HAP)

SUPPLEMENT 02
Regulatory Discussion

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
Application for Title V Operating Permit (45CSR30)

A. Applicability of New Source Review (NSR) Regulations

The following New Source Review (NSR) regulations are potentially applicable to natural gas processing plants. Applicability to the subject facility has been determined as follows:

1. Prevention of Significant Deterioration (PSD) [Not Applicable]

This rule does not apply. The facility is a “PSD Minor Source” for each regulated pollutant, as follows:

- NOx: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy
- CO: PSD Synthetic Minor Source with Pre-Controlled PTE < 250 tpy
- VOC: PSD Synthetic Minor Source with Pre-Controlled PTE < 250 tpy
- SO₂: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy
- PM_{10/2.5}: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy

2. Non-Attainment New Source Review (NNSR) [Not Applicable]

This rule does not apply. The facility location is designated as either “Maintenance” or “Attainment/Unclassified” for all criteria pollutants.

3. Major Source of Hazardous Air Pollutants (HAPs) [Not Applicable]

This rule does not apply. The facility qualifies as a “HAP Area Source” as follows:

- Each HAP: HAP Area Source with Controlled Individual HAP PTE < 10 tpy
- Total HAPs: HAP Area Source with Controlled Total of All HAPs PTE < 25 tpy

4. Title V Operating Permit (TVOP) [Applicable]

This rule does apply. The facility is subject to Title V permit requirements because the potential to emit (PTE) VOC and CO_{2e} are greater than 100 tpy and 100,000 tpy, respectively (including fugitive emissions). 45CSR30 2.26.b.38 requires fugitive emissions to be included in the major source determination for natural gas processing facilities. The facility has the following potential to emit air pollutants:

- NOx: Title V Synthetic Minor Source with Controlled PTE < 100 tpy
- CO: Title V Synthetic Minor Source with Controlled PTE < 100 tpy
- VOC: Title V Major Source with Controlled PTE > 100 tpy
- SO₂: Title V Natural Minor Source with Pre-Controlled PTE < 100 tpy
- PM_{10/2.5}: Title V Natural Minor Source with Pre-Controlled PTE < 100 tpy
- Each HAP: Title V Synthetic Area Source with Controlled PTE < 10 tpy
- Total HAPs: Title V Synthetic Area Source with Controlled PTE < 25 tpy
- CO_{2e}: Title V Major Source with Controlled PTE > 100,000 tpy

B. Applicability of Federal Regulations

The following federal regulations are potentially applicable to natural gas processing plants. Applicability to the facility has been determined as follows:

1. **NSPS Dc, Steam Generating Units**

40CFR§60.40c-§60.48c

[Applicable]

This rule does apply to the 10.0 MMBtu/hr hot oil heater (H-01) and the 21.22 MMBtu/hr heat medium heaters (H-05 and H-06) because each has a maximum design heat input capacity ≥ 10 MMBtu/hr and ≤ 100 MMBtu/hr (§60.40c(a)).

Requirements include recording and maintaining records of the amount of each fuel combusted during each calendar month (§60.48c(g)(2)).

2. **NSPS Kb, Volatile Organic Liquid Storage Vessels**

40CFR§60.110b-§60.117b

[Not Applicable]

This rule does not apply because there is no atmospheric storage tank used to store volatile organic liquids (VOL) with a design capacity ≥ 75 m³ (19,815 gal, 471.79 bbl) (§60.110b(a)). In accordance with 40CFR§60.110b(d)(2), this rule does not apply to pressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere.

3. **NSPS GG, Stationary Gas Turbines**

40CFR§60.330-§60.335

[Not Applicable]

This rule does not apply because there is no stationary gas turbine at the facility (§60.330).

4. **NSPS KKK, Leaks from Natural Gas Processing Plants**

40CFR§60.630-§60.636

[Applicable]

This rule does apply to certain process units because the facility is a natural gas processing plant that is engaged in the extraction of natural gas liquids from field gas (§60.630(e)).

Requirements include Leak Detection and Repair (LDAR) monitoring (§60.632), recordkeeping (§60.635), and reporting requirements (§60.636).

5. **NSPS LLL, Onshore Natural Gas Processing: SO₂ Emissions**

40CFR§60.640-§60.648

[Not Applicable]

This rule does not apply because there is no gas sweetening operation at the facility (§60.640(a)).

6. **NSPS IIII, Compression Ignition Reciprocating Internal Combustion Engines**

40CFR§60.4200-§60.4219

[Not Applicable]

This rule does not apply because there is no stationary compression ignition engine at the facility (§60.4200(a)).

7. NSPS JJJJ, Stationary Spark Ignition (SI) Internal Combustion Engines (ICE)

40CFR§60.4230-§60.4248

[Applicable]

This rule does not apply to the 3,550 bhp CAT G3612LE compressor engines (CE-03 thru CE-05) because they are lean burn with bhp \geq 1,350 and were manufactured before 07/01/07 (§60.4230(a)(4)(i)).

This rule does not apply to the CAT G342NA (CE-01) or CAT 398TA (CE-02) engines because they commenced construction before June 12, 2006 (§60.4230(a)(5)).

This rule does apply to the Olympian G70LG emergency generator engine (GE-01) because it has a rating greater than 25 HP and was manufactured after July 1, 2009 (§60.4230(a)(4)(iv)). The engine is subject to the emission standards in §60.4233(c) or §60.4233(3), depending on whether propane or natural gas is used as fuel rule.

8. NSPS KKKK, Stationary Combustion Turbines

40CFR§60.4300-§60.4420

[Not Applicable]

This rule does not apply because there is no stationary combustion turbine at the facility (§60.4300).

9. NSPS OOOO, Crude Oil and Natural Gas Production

40CFR§60.5360-§60.5430

[Applicable]

This rule does apply to the electrically driven Columbia gas compressor (CM-01) because it was constructed after 08/23/11 (§60.5360 and §60.5365(c)). Requirements include replacing the rod-packing system on a specified schedule; also monitoring, recordkeeping and reporting requirements.

This rule does not apply to the produced water tanks (T-02, T-03 and T-04) because each tank does not have the potential to emit > 6 tpy of VOC. The only requirement is to maintain documentation that the VOC emission rate is < 6 tpy (§60.5420(b)(6)(ii) and §60.5420 (c)(5)(ii)).

This rule does apply to the group of all equipment, except compressors, within a process unit (§60.5365(f)). The equipment leak standards specified in §60.5400 apply to certain process units

This rule does not apply to the pneumatic controllers because they use compressed air rather than natural gas for actuation (§60.5365(c)(3)).

10. NESHAP HH, Oil and Natural Gas Production Facilities

40CFR§63.760-§63.779

[Applicable]

This rule does apply to the tri-ethylene glycol (TEG) dehydrator (DH-01). However, because the TEG dehydrator has an actual annual average flowrate of natural gas < 3 MMscfd or will have an actual annual average benzene emissions < 0.9 megagrams per year, it is exempt from all requirements except to maintain records of actual annual average flowrate of natural gas or actual annual average benzene emissions to demonstrate continuing exemption status (§63.764(e)(1))

This rule does not apply to storage vessels (tanks), compressors, or ancillary equipment because the facility is an area source of HAP emissions (§63.760(b)(2)). In no case does this rule apply to engines or turbines.

11. NESHAP HHH, Natural Gas Transmission and Storage Facilities

40CFR§63.1270-§63.1289

[Not Applicable]

This rule does not apply because the facility is not a natural gas transmission or storage facility transporting or storing natural gas prior to local distribution (§63.1270(a)).

12. NESHAP YYYY, Stationary Combustion Turbines

40CFR§63.6080-§63.6175

[Not Applicable]

This rule does not apply because there is no stationary gas turbine at the facility (§63.6080).

13. NESHAP ZZZZ, Stationary Reciprocating Internal Combustion Engines (RICE)

40CFR§63.6580-§63.6675

[Applicable]

This rule does apply to all of the stationary reciprocating internal combustion engines.

This rule does apply to the 225 bhp Caterpillar G342NA engine (CE-01) because it is an “existing engine”; i.e., commenced construction before 06/12/06 (§63.6590(a)(1)(iii)). Because it is an existing, non-emergency, rich burn, remote stationary RICE ≤ 500 bhp, the requirements include work practice standards ((§63.6625 and Table 2d), notifications, reports and records (§63.6640 - §63.6660).

This rule does apply to the 625 bhp Caterpillar G398TA engine (CE-02) because it is an “existing engine”; i.e., commenced construction before 06/12/06 (§63.6590(a)(1)(iii)). Because it is an existing, non-emergency, rich burn, remote stationary RICE > 500 bhp, the requirements include work practice standards ((§63.6625 and Table 2d), notifications, reports and records (§63.6640 - §63.6660).

This rule does apply to the Caterpillar G3612LE engines (CE-03 thru CE-05) because they are “existing engines”; i.e., commenced construction before 06/12/06 (§63.6590(a)(1)(iii)). Because they are existing, non-emergency, lean burn, remote stationary RICE > 500 bhp, the requirements include work practice standards ((§63.6625 and Table 2d), notifications, reports and records (§63.6640 - §63.6660).

This rule does apply to the Olympian G70LG emergency generator engine (GE-01) because it is a “new engine”; i.e., commenced construction after 06/12/06 (§63.6590(a)(2)(iii)). In accordance with §63.6590(c)(1)(i), compliance with NESHAP Subpart ZZZZ is achieved by meeting the requirements of NSPS Subpart JJJJ. No further requirements apply for the emergency generator engine under NESHAP Subpart ZZZZ.

The determination that each engine at Fort Beeler Gas Plant meets the definition of “remote stationary RICE” is based on the Department of Transportation (DOT) pipeline classification. 49 CFR Part 192 at §192.5 which defines various class locations. The pipeline segment at Fort Beeler meets the definition of Class 1. As found in §192.5, Class 1 is “any class location unit that has 10 or fewer buildings intended for human occupancy” and a class location unit is “an onshore area that extends 220 yards (200

meters) on either side of the centerline of any continuous 1- mile (1.6 kilometers) length of pipeline.” Note the definition of “remote stationary RICE” in 40 CFR Part 63 Subpart ZZZZ is based on the Class 1 definition found in 49 CFR Part 192.

The pipeline map in Attachment B demonstrates the presence of a Class 1 pipeline at Fort Beeler Gas Plant and thus an engine classification of “remote stationary RICE” under NESHAP Subpart ZZZZ.

14. NESHAP DDDDD, Industrial, Commercial, and Institutional Boilers and Process Heaters – Major Sources

40CFR§63.7480 – §63.7575

[Not Applicable]

This rule does not apply because the facility is not a major source of HAP (§63.7485).

15. NESHAP JJJJJ, Industrial, Commercial, and Institutional Boilers and Process Heaters – Area Sources

40CFR§63.11193 – §63.11237

[Not Applicable]

This rule does not apply because gas-fired boilers are not subject to the requirements of this subpart (§63.11195(e)). Specifically, “boiler” is defined as an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam and/or hot water.

16. Chemical Accident Prevention Provisions (RMP)

40CFR§68.1-§68.220

[Applicable]

This rule does apply because the facility stores more than a threshold quantity of regulated substance in a process (§68.115).

17. Compliance Assurance Monitoring (CAM)

40CFR§64.1 §64.10

[Not Applicable]

This rule does not apply because although the facility is a major source that is required to obtain a part 70 permit (State issued Title V Operating Permit) or 71 permit (EPA issued Title V Operating Permit), there is no emission source with pre-controlled emissions greater than 100 TPY (§64.2(a)).

18. Mandatory Greenhouse Gases (GHG) Reporting

40CFR§98.1-§98.9

[Potentially Applicable]

This rule potentially applies. The facility is not subject to a listed source category; however, the aggregate maximum heat input capacity of the stationary fuel combustion units is ≥ 30 MMBtu/hr and the facility has the potential to emit $\geq 25,000$ metric ton/yr (27,558 tpy) of CO₂e/yr from all stationary fuel combustion sources combined (§98.2(a)).

Records must be kept of actual CO₂, CH₄ and N₂O emissions to determine the actual CO₂e emissions. If such emissions exceed the 25,000 metric ton/yr threshold then an annual report must be submitted no later than March 31st of each calendar year thereafter.

C. Applicability of Source Aggregation

For New Source Review (NSR) and Title V permitting, the three-part regulatory criteria to determine whether emissions from two or more facilities should be aggregated and treated as a single source are whether the activities:

- i) Belong to the same industrial grouping;
- ii) Are located on one or more contiguous or adjacent properties and meets the common sense notion of a plant; and
- iii) Are under control of the same person (or persons under common control).

i) Same Industrial Grouping

The subject facility will operate under SIC code 1321 (Natural Gas Liquids Extraction). The upstream gas production wells will operate under SIC code 1311 (Crude Petroleum and Natural Gas). Therefore, the subject facility shares the same two-digit major SIC code of 13 as the upstream gas production wells.

ii) Contiguous or Adjacent and “Plant”

The determination of whether two or more facilities are “contiguous” or “adjacent” is made on a case-by-case basis. This determination is both: a) proximity based and b) whether it meets the common sense notion of a plant. The functional interrelationship of the two or more facilities is not a relevant inquiry in determining whether the facilities are “contiguous” or “adjacent”.

Neither West Virginia nor federal regulations define the terms “contiguous” or “adjacent” or place any definitive restrictions on how distant two emission units can be and still be considered located on contiguous or adjacent properties for the purposes of a single source determination. It is clear, however, that the determination of whether two or more facilities are “contiguous” or “adjacent” is based on the plain meaning of the terms “adjacent” and “contiguous”, which consider the physical distance between the facilities. The term contiguous is defined in the dictionary as being in actual contact; touching along a boundary or at a point. The term “adjacent” is defined in the dictionary as not distant, nearby, having a common endpoint or border.

The Fort Beeler Processing Plant processes gas produced from multiple upstream production wells located in northern West Virginia and Eastern Ohio. The subject facility is located on a parcel that is directly adjacent to a single upstream production wellpad operated by TransEnergy (the “TransEnergy Wellpad”) and is located less than half a mile from that wellpad. Other upstream production wells from which gas is processed at the Fort Beeler Processing Plant are located further from the facility.

The location of the subject facility was chosen because of suitable characteristics for construction and operation, such as the availability of a reasonably flat grade and accessibility for large trucks and equipment. Williams’ business model is to construct scalable capacity that contemplates additional production from multiple operators and the initial configuration is merely a foundation for additional opportunities in the area.

The subject facility does not need to be located in the immediate vicinity of the TransEnergy Wellpad in order to operate properly. Indeed, the TransEnergy Wellpad does not produce a substantial portion of the gas processed at the Fort Beeler Processing Plant and the subject facility is located further from other upstream production wells even though those wells provide a larger volume of the gas that is processed at the facility. Had suitable land been available elsewhere, the subject facility could have been located further from the TransEnergy Wellpad and could theoretically be moved further from this wellpad without affecting operations.

Therefore, despite the fact that the subject facility is located in close proximity to one of many upstream production sources, aggregation of the Fort Beeler Processing Plant with this single upstream production wellpad does not meet the common sense notion of a plant.

iii) Common Control

Williams OVM operates under its parent company The Williams Companies, Inc. (Williams) and is the sole operator of the subject facility. The closest Williams-operated facility to the subject facility is the Whipkey compressor station, which is located approximately 0.9 miles away. The production wells, including the TransEnergy Wellpad, that send natural gas to the subject facility are owned and operated by other companies, which are unaffiliated with Williams. Williams has no ownership stake in the TransEnergy wellpad or in any other production well that may send natural gas to the subject facility.

Furthermore, neither Williams OVM, nor Williams, exercise operational control over any equipment owned or operated by any natural gas producer upstream of the subject facility. All employees at the subject facility are under the exclusive direction of Williams and are not under the control of any other entity. Similarly, Williams has no authority over employees of the production wells. These companies operate wholly independent of one another. No employees are expected to shuttle back and forth between the subject facility and any production well.

At this time, contracts are in place for the subject facility to process natural gas produced from multiple upstream production wells located throughout the region. As future commercial opportunities are identified, the subject facility will potentially receive gas from other producers. Williams will not have ownership or control of any future wellhead facilities. The producers are, and will be responsible for, any decisions to produce or shut-in wellhead facilities and have no control over the equipment installed, owned, and operated by Williams. Similarly, Williams cannot control the installation or operation of any equipment located at a well site that may be considered an air contamination source.

Summary

The subject facility and the upstream production wells should not be aggregated and treated as a single source of emissions because the subject facility is not under common control with any of the upstream wells. Additionally, the subject facility and the upstream production wells, considered together, do not meet the common sense notion of a plant because the subject facility is expected to service multiple production wells and because the location of the facility was selected for reasons unrelated to

the location of the production wells. Accordingly, the subject facility should not be aggregated with the upstream wells in determining major source or PSD status.

D. Applicability of State Regulations

The following State regulations are potentially applicable to natural gas processing plants. Applicability to the facility has been determined as follows:

1. Particulate Air Pollution from Combustion of Fuel

45CSR2

[Applicable]

This rule does apply to the gas-fueled heaters (H-01 thru H-06); limiting opacity to 10% based on a six minute block average.

Any fuel burning unit with a heat input ≥ 10 MMBtu/hr (H-01, H-05 and H-06) is also subject to Sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions).

2. Prevent and Control of Objectionable Odors

45CSR4

[Applicable]

This rule does apply and states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable. No odors have been deemed objectionable.

3. Control of Air Pollution from Combustion of Refuse

45CSR6

[Applicable]

This rule does apply as 45CSR6 establishes emission standards for particulate matter and requirements for activities involving incineration of refuse. As the flare is required to be smokeless except for periods not to exceed a total of 5 minutes during any 2 consecutive hours, particulate matter emissions should be negligible and the flare will comply with the applicable emission standard. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the flare and the hours of operation. The facility will also monitor the flare pilot flame and record any malfunctions that may cause no flame to be present during facility operation.

4. Prevent and Control Air Pollution – Sulfur Oxides

45CSR10

[Applicable]

This rule does apply to the gas-fueled heaters w/ a Maximum Design Heat Input (MDHI) rating > 10 MMBtu/hr (H-01, H-05 and H-06) (§45-10-10.1). Requirements are specified in 45CSR10 Sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting).

5. Permits for Construction, Modification, Relocation and Operation

45CSR13

[Applicable]

This rule does apply. Williams OVM has received a 45CSR13 Permit for the subject facility.

6. Permits for Construction and Modification of Major Stationary Sources

45CSR14

[Not Applicable]

The rule does not apply because the facility is neither a new major source of pollutants nor is the proposed modification a modification to an existing major source.

7. Standards of Performance for New Stationary Sources (40 CFR Part 60)

45CSR16

[Applicable]

This rule does apply to this source by reference of §40CFR60 Subparts Dc, KKK, JJJJ, and OOOO. Williams is subject to the recordkeeping, monitoring, and testing required of these Subparts.

8. Permits for Construction and Modification (Nonattainment)

45CSR19

[Not Applicable]

This rule does not apply because the facility is a nonmajor (or “deferred”) source of all regulated pollutants.

9. Regulation of Volatile Organic Compounds (VOC)

45CSR21

[Not Applicable]

This rule does not apply because facility is not located in Putnam County, Kanawha County, Cabell County, Wayne County, or Wood County

10. Air Quality Management Fees Program

45CSR22

[Applicable]

This rule does apply. It establishes a program to collect fees for certificates to operate and for permits to construct, modify or relocate sources of air pollution.

11. Prevent and Control Emissions of Toxic Air Pollutants

45CSR27

[Not Applicable]

This rule does not apply because equipment is used in the production and distribution of petroleum products is exempt, provided that the product contains no more than 5% benzene by weight (§45-22-2.4).

12. Air Pollution Emissions Banking and Trading

45CSR28

[Not Applicable]

This rule does not apply. The facility does not choose to participate in the voluntarily statewide air pollutant emissions trading program.

13. Emission Statements for VOC and NOX

45CSR29

[Not Applicable]

This rule does not apply because facility is not located in Putnam, Kanawha, Cabell, Wayne, Wood, or Greenbrier Counties (§45-29-1).

14. Requirements for Operating Permits

45CSR30

[Applicable]

This rule does apply. The facility is subject to Title V permit requirements because the potential to emit (PTE) VOC and CO₂e are greater than 100 tpy and 100,000 tpy, respectively (including fugitive emissions). 45CSR30 2.26.b.38 requires fugitive emissions to be included in the major source determination for natural gas processing facilities. The facility has the following potential to emit air pollutants:

- NOx: Title V Synthetic Minor Source with Controlled PTE < 100 tpy
- CO: Title V Synthetic Minor Source with Controlled PTE < 100 tpy
- VOC: Title V Major Source with Controlled PTE > 100 tpy
- SO₂: Title V Natural Minor Source with Pre-Controlled PTE < 100 tpy
- PM_{10/2.5}: Title V Natural Minor Source with Pre-Controlled PTE < 100 tpy
- Each HAP: Title V Synthetic Area Source with Controlled PTE < 10 tpy
- Total HAPs: Title V Synthetic Area Source with Controlled PTE < 25 tpy
- CO₂e: Title V Major Source with Controlled PTE > 100,000 tpy

15. Emission Standards for Hazardous Air Pollutants (HAP)

45CSR34

[Applicable]

This rule does apply. This rule adopts EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) other regulatory requirements pursuant to 40 CFR Parts 61, 63 and section 112 of the federal Clean Air Act, as amended.

SUPPLEMENT 03

Emission Calculations

§45-30-4.3.c.8 - The application forms shall include calculations or test data on which the information is based.

SUMMARIES:

- Criteria Pollutants - Controlled Emissions Summary
- Hazardous Air Pollutants - Controlled Emissions Summary
- Greenhouse Gas (GHG) - Controlled Emissions Summary
- Pre-Controlled Emissions Summary

UNIT SPECIFIC:

- Recovery Compressor Engine 01 - 225 bhp CAT G342NA (CE-01 (1E))
- Recovery Compressor Engine 02 - 625 bhp CAT G398TA (CE-02 (2E))
- TXP1 Compressor Engines 03 thru 05 - 3,550 bhp CAT G3612LE
(CE-03 (3E) thru CE-05 (5E))
- Startup/Shutdown/Maintenance (Including Blowdown) (SSM (6E))
- Compressor Rod Packing and Engine Crankcase (RPC (7E))
- Emergency Generator Engine - 118 bhp Olympian G70LG (GE-01 (8E))
- TXP1 Hot Oil Heater - 10.0 MMBtu/hr (H-01 (9E))
- TXP1 Regenerator Gas Heater - 4.74 MMBtu/hr (H-02 (10E))
- TXP2 and TXP3 Regenerator Gas Heater - 6.60 MMBtu/hr (H-03 (11E) and H-04 (12E))
- TXP2 and TXP3 Heat Medium Heater - 21.22 MMBtu/hr (H-05 (13E) and H-06 (14E))
- Dehydrator Flash Tank and Still Vent - 5.0 MMscfd (DH-01 (15E))
- Dehydrator Reboiler - 0.20 MMBtu/hr (BLR-01 (16E))
- Old Process Flare (FL-01 (17E))
- New Process Flare (FL-02 (18E))
- Truck Load-Out (TLO (20E))
- Produced H₂O Storage Tanks (T-03 (22E) and T-04 (23E))
- Facility-Wide Process Piping Fugitive Emissions (FUG (21E))

AP-42 and GHG EMISSION FACTORS

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Criteria Pollutants - Controlled Emissions Summary

Unit ID	Point ID	Description	Site Rating	NOX		CO		VOC		SO2		PM10/2.5		CO2e	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-01	1E	CAT G342NA Compressor Engine	225 bhp	0.05	0.22	0.99	4.35	0.28	1.22	1.2E-03	0.01	0.04	0.18	272	1,191
CE-02	2E	CAT G398TA Compressor Engine	625 bhp	0.69	3.02	0.69	3.04	0.09	0.39	3.4E-03	0.01	0.11	0.49	712	3,117
CE-03	3E	CAT G3612LE Compressor Engine	3,550 bhp	3.91	17.14	2.15	9.43	2.85	12.48	0.02	0.07	0.26	1.14	4,523	19,813
CE-04	4E	CAT G3612LE Compressor Engine	3,550 bhp	3.91	17.14	2.15	9.43	2.85	12.48	0.02	0.07	0.26	1.14	4,523	19,813
CE-05	5E	CAT G3612LE Compressor Engine	3,550 bhp	3.91	17.14	2.15	9.43	2.85	12.48	0.02	0.07	0.26	1.14	4,523	19,813
SSM	6E	Startup/Shutdown/Maintenance	na	---	---	---	---	---	11.00	---	---	---	---	---	4,112
RPC	7E	Rod Packing/Crankcase	na	---	---	---	---	3.49	15.27	---	---	---	---	1,107	4,849
GE-01	8E	Olympian G70LG EmGen Engine	118 bhp	0.93	0.23	29.10	7.28	0.38	0.10	8.9E-04	2.2E-04	0.03	0.01	168	42
H-01	9E	TXP1 Hot Oil Heater	10.0 MMBtu/hr	1.09	4.76	0.91	4.00	0.06	0.26	0.01	0.03	0.08	0.36	1,298	5,686
H-02	10E	TXP1 Regen Gas Heater	4.74 MMBtu/hr	0.52	2.26	0.43	1.90	0.03	0.12	3.1E-03	0.01	0.04	0.17	615	2,695
H-03	11E	TXP2 Regen Gas Heater	6.60 MMBtu/hr	0.72	3.14	0.60	2.64	0.04	0.17	4.3E-03	0.02	0.05	0.24	857	3,753
H-04	12E	TXP3 Regen Gas Heater	6.60 MMBtu/hr	0.72	3.14	0.60	2.64	0.04	0.17	4.3E-03	0.02	0.05	0.24	857	3,753
H-05	13E	TXP2 Heat Medium Heater	21.22 MMBtu/hr	2.31	10.10	1.94	8.49	0.13	0.56	0.01	0.06	0.18	0.77	2,755	12,067
H-06	14E	TXP3 Heat Medium Heater	21.22 MMBtu/hr	2.31	10.10	1.94	8.49	0.13	0.56	0.01	0.06	0.18	0.77	2,755	12,067
DH-01	15E	Groves Dehydrator - Flash Tank/Still Vent	5.0 MMscfd	---	---	---	---	3.88	17.00	---	---	---	---	128	562
BLR-01	16E	Groves Dehydrator - Reboiler	0.20 MMBtu/hr	0.02	0.10	0.02	0.08	1.2E-03	0.01	1.3E-04	5.7E-04	1.7E-03	0.01	26	114
FL-01	17E	Old Process Flare	5.0 MMscfy	16.32	0.19	88.80	1.04	7.47	0.09	0.14	1.7E-03	1.79	0.02	33,472	392
FL-02	18E	New Process Flare	59.2 MMscfy	36.85	2.56	200.51	13.94	127.79	8.88	0.32	0.02	4.04	0.28	74,175	5,158
TLO	20E	Truck Load-Out - Prod H2O/Oil	600,000 bbl/yr	---	---	---	---	---	1.96	---	---	---	---	---	---
FUG	21E	Facility Process Piping Fugitives	na	---	---	---	---	13.39	58.67	---	---	---	---	386	1,689
T-03	22E	Prod. H2O Tank (9913 Tank)	400 bbl	---	---	---	---	0.23	1.01	---	---	---	---	---	---
T-04	23E	Prod. H2O Tank (9914 Tank)	400 bbl	---	---	---	---	0.23	1.01	---	---	---	---	---	---

TOTAL FACILITY-WIDE PTE:	74.25	91.25	333.00	86.14	166.19	155.87	0.56	0.45	7.37	6.96	133,153	120,685
NNSR/PSD Threshold:		250		250		250		250		250		na
TVOP Threshold:		100		100		100		100		100		100,000

- Notes: 1 - Emissions are based on operation at 100% of rated load for 8,760 hrs/yr; except TLO and SSM emissions are intermittent (and infrequent).
 2 - VOC is volatile organic compounds, as defined by EPA, and includes HCHO (formaldehyde).
 3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.
 4 - CO2e is aggregated Greenhouse Gas (GHG), comprised of carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O), as adjusted for Global Warming Potential (GWP).

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Hazardous Air Pollutants - Controlled Emissions Summary

Unit ID	Point ID	Description	Site Rating	Benzene		Ethylbenzene		HCHO		n-Hexane		Toluene		Xylenes		Other HAP		Total HAP	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-01	1E	CAT G342NA Compressor Engine	225 bhp	3.4E-03	0.01	5.3E-05	2.3E-04	0.03	0.13	---	---	1.2E-03	5.2E-03	4.1E-04	1.8E-03	0.02	0.09	0.05	0.24
CE-02	2E	CAT G398TA Compressor Engine	625 bhp	1.8E-03	8.0E-03	2.9E-05	1.3E-04	0.03	0.14	---	---	6.5E-04	2.8E-03	2.3E-04	9.9E-04	0.01	0.05	0.05	0.20
CE-03	3E	CAT G3612LE Compressor Engine	3,550 bhp	0.01	0.03	5.2E-04	2.3E-03	0.31	1.34	0.01	0.06	0.01	0.02	2.4E-03	0.01	0.22	0.97	0.56	2.43
CE-04	4E	CAT G3612LE Compressor Engine	3,550 bhp	0.01	0.03	5.2E-04	2.3E-03	0.31	1.34	0.01	0.06	0.01	0.02	2.4E-03	0.01	0.22	0.97	0.56	2.43
CE-05	5E	CAT G3612LE Compressor Engine	3,550 bhp	0.01	0.03	5.2E-04	2.3E-03	0.31	1.34	0.01	0.06	0.01	0.02	2.4E-03	0.01	0.22	0.97	0.56	2.43
SSM	6E	Startup/Shutdown/Maintenance	na	---	0.33	---	0.33	---	---	---	0.33	---	0.33	---	0.33	---	---	---	1.16
RPC	7E	Rod Packing/Crankcase	na	0.10	0.43	0.10	0.43	5.0E-02	0.22	0.10	0.43	0.10	0.43	0.10	0.43	---	---	0.37	1.60
GE-01	8E	Olympian G70LG EmGen Engine	118 bhp	2.4E-03	6.0E-04	3.7E-05	9.4E-06	0.03	0.01	---	---	8.4E-04	2.1E-04	2.9E-04	7.4E-05	0.01	3.6E-03	0.05	0.01
H-01	9E	TXP1 Hot Oil Heater	10.0 MMBtu/hr	2.3E-05	2.3E-05	---	---	8.2E-04	3.6E-03	0.02	0.09	3.7E-05	1.6E-04	---	---	2.1E-05	9.0E-05	0.02	0.09
H-02	10E	TXP1 Regen Gas Heater	4.74 MMBtu/hr	1.1E-05	1.1E-05	---	---	3.9E-04	1.7E-03	0.01	0.04	1.8E-05	7.7E-05	---	---	9.8E-06	4.3E-05	0.01	0.04
H-03	11E	TXP2 Regen Gas Heater	6.60 MMBtu/hr	1.5E-05	1.5E-05	---	---	5.4E-04	2.4E-03	0.01	0.06	2.4E-05	1.1E-04	---	---	1.4E-05	6.0E-05	0.01	0.06
H-04	12E	TXP3 Regen Gas Heater	6.60 MMBtu/hr	1.5E-05	1.5E-05	---	---	5.4E-04	2.4E-03	0.01	0.06	2.4E-05	1.1E-04	---	---	1.4E-05	6.0E-05	0.01	0.06
H-05	13E	TXP2 Heat Medium Heater	21.22 MMBtu/hr	4.8E-05	4.8E-05	---	---	1.7E-03	0.01	0.04	0.18	7.8E-05	3.4E-04	---	---	4.4E-05	1.9E-04	0.04	0.19
H-06	14E	TXP3 Heat Medium Heater	21.22 MMBtu/hr	4.8E-05	4.8E-05	---	---	1.7E-03	0.01	0.04	0.18	7.8E-05	3.4E-04	---	---	4.4E-05	1.9E-04	0.04	0.19
DH-01	15E	Groves Dehydrator - Flash Tank/Still V	5.0 MMscfd	0.07	0.31	---	---	---	---	0.07	0.30	0.31	1.34	0.98	4.27	---	---	1.42	6.22
BLR-01	16E	Groves Dehydrator - Reboiler	0.20 MMBtu/hr	4.6E-07	2.0E-06	---	---	1.6E-05	7.1E-05	3.9E-04	1.7E-03	7.4E-07	3.2E-06	---	---	4.1E-07	1.8E-06	4.1E-04	1.8E-03
FL-01	17E	Old Process Flare	5.0 MMscfy	0.21	2.5E-03	0.21	2.5E-03	---	---	0.21	2.5E-03	0.21	2.5E-03	0.21	2.5E-03	---	---	1.07	0.01
FL-02	18E	New Process Flare	59.2 MMscfy	4.26	0.30	4.26	0.30	---	---	4.26	0.30	4.26	0.30	4.26	0.30	---	---	21.30	1.48
TLO	20E	Truck Load-Out - Prod H2O/Oil	600,000 bbl/yr	---	0.10	---	0.10	---	---	---	0.10	---	0.10	---	0.10	---	---	---	0.49
FUG	21E	Facility Process Piping Fugitives	na	0.32	1.41	0.32	1.41	---	---	0.32	1.41	0.32	1.41	0.32	1.41	---	---	0.45	1.99
T-03	22E	Prod. H2O Tank (9913 Tank)	400 bbl	0.01	0.05	0.01	0.05	---	---	0.01	0.05	0.01	0.05	0.01	0.05	---	---	0.06	0.25
T-04	23E	Prod. H2O Tank (9914 Tank)	400 bbl	0.01	0.05	0.01	0.05	---	---	0.01	0.05	0.01	0.05	0.01	0.05	---	---	0.06	0.25

TOTAL FACILITY-WIDE PTE:	5.01	3.08	4.92	2.68	1.07	4.54	5.17	3.76	5.24	4.08	5.90	6.98	0.71	3.04	26.68	21.85
NNSR/PSD Threshold:	na	na														
TVOP Threshold:	10	10	10	10	10	10	10	10	10	10	10	10	10	10	25	25

Notes: 1 - Emissions are based on operation at 100% of rated load for 8,760 hrs/yr; except TLO and SSM emissions are intermittent (and infrequent).
 2 - HCHO is formaldehyde; Other HAP includes, but not limited to, acetaldehyde, acrolein, methanol (MeOH) and 2,2,4-Trimethylpentane (i-Octane).

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Greenhouse Gas (GHG) - Emissions Summary

Unit ID	Point ID	Description	Site Rating	Operating Hours hr/yr	Heat Input		CO2	CO2e	CH4	CO2e	N2O	CO2e	TOTAL CO2e tpy
					LHV MMBtu/hr	HHV MMBtu/hr	kg/MMBtu: GWP: 1 tpy	53.06 tpy	kg/MMBtu: GWP: 25 tpy	1.00E-03 tpy	kg/MMBtu: GWP: 298 tpy	1.00E-04 tpy	
CE-01	1E	CAT G342NA Compressor Engine	225 bhp	8,760	1.91	2.12	1,093	1,093	3.91	97.77	2.0E-03	0.61	1,191
CE-02	2E	CAT G398TA Compressor Engine	625 bhp	8,760	5.24	5.81	2,995	2,995	4.83	120.70	0.01	1.67	3,117
CE-03	3E	CAT G3612LE Compressor Engine	3,550 bhp	8,760	23.53	26.09	15,117	15,117	187.51	4,688	2.5E-02	7.51	19,813
CE-04	4E	CAT G3612LE Compressor Engine	3,550 bhp	8,760	23.53	26.09	15,117	15,117	187.51	4,688	2.5E-02	7.51	19,813
CE-05	5E	CAT G3612LE Compressor Engine	3,550 bhp	8,760	23.53	26.09	15,117	15,117	187.51	4,688	0.03	7.51	19,813
SSM	6E	Startup/Shutdown/Maintenance	na	8,760	---	---	---	---	164	4,112	---	---	4,112
RPC	7E	Rod Packing/Crankcase	na	8,760	---	---	372	372	179	4,477	---	---	4,849
GE-01	8E	Olympian G70LG EmGen Engine	118 bhp	500	0.91	1.01	34	34	0.31	8	3.3E-04	0.10	42
H-01	9E	TXP1 Hot Oil Heater	10.0 MMBtu/hr	8,760	10.00	11.09	5,681	5,681	0.11	3	0.01	3	5,686
H-02	10E	TXP1 Regen Gas Heater	4.74 MMBtu/hr	8,760	4.74	5.26	2,693	2,693	0.05	1	0.01	2	2,695
H-03	11E	TXP2 Regen Gas Heater	6.60 MMBtu/hr	8,760	6.60	7.32	3,749	3,749	0.07	2	0.01	2	3,753
H-04	12E	TXP3 Regen Gas Heater	6.60 MMBtu/hr	8,760	6.60	7.32	3,749	3,749	0.07	2	0.01	2	3,753
H-05	13E	TXP2 Heat Medium Heater	21.22 MMBtu/hr	8,760	21.22	23.53	12,054	12,054	0.23	6	0.02	7	12,067
H-06	14E	TXP3 Heat Medium Heater	21.22 MMBtu/hr	8,760	21.22	23.53	12,054	12,054	0.23	6	0.02	7	12,067
DH-01	15E	Groves Dehydrator - Flash Tank/Still Vent	5.0 MMscfd	8,760	---	---	---	---	22.50	562.4	---	---	562
BLR-01	16E	Groves Dehydrator - Reboiler	0.20 MMBtu/hr	8,760	0.20	0.22	114	114	2.1E-03	0.05	2.1E-04	0.06	114
FL-01	17E	Old Process Flare	5.0 MMscfy	8,760	0.58	0.64	339	339	2	53	6.2E-04	0.18	392
FL-02	18E	New Process Flare	59.2 MMscfy	8,760	7.74	8.60	4,637	4,637	20.72	518	0.01	2	5,158
TLO	20E	Truck Load-Out - Prod H2O/Oil	600,000 bbl/yr	---	---	---	---	---	---	---	---	---	---
FUG	21E	Facility Process Piping Fugitives	na	8,760	---	---	---	---	68	1,688	---	---	1,688
T-03	22E	Prod. H2O Tank (9913 Tank)	400 bbl	8,760	---	---	---	---	---	---	---	---	---
T-04	23E	Prod. H2O Tank (9914 Tank)	400 bbl	8,760	---	---	---	---	---	---	---	---	---

TOTAL FACILITY-WIDE PTE:	94,915		1,029		0.2		120,684
NNSR/PSD Threshold:	na	- OR -	na	- OR -	na	- AND -	na
TVOP Threshold:	na		na		na		100,000

- Notes:
- 1 - HCHO is formaldehyde; Other HAP includes, but not limited to, acetaldehyde, acrolein, methanol (MeOH) and 2,2,4-Trimethylpentane (i-Octane).
 - 2 - The CO2 and CH4 emissions for engines (CE) are based on vendor data, where available.
 - 3 - The CH4 and N2O emissions for SSM and RPC are based on vendor data and mass balance.
 - 4 - All other GHG emissions are based on default values in 40CFR98, Subparts A and C, Tables A-1, C-1 and C-2.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)
Pre-Controlled Emissions Summary

Unit ID	Point ID	Description	Site Rating	NOX		CO		VOC		HCHO		Xylenes		Total HAP		CO2e	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-01	1E	CAT G342NA Compressor Engine	225 bhp	6.40	28.03	6.80	29.77	0.37	1.63	0.12	0.54	4.1E-04	1.8E-03	0.15	0.65	272	1,191
CE-02	2E	CAT G398TA Compressor Engine	625 bhp	13.50	59.14	14.74	64.58	0.41	1.81	0.14	0.60	1.1E-03	5.0E-03	0.21	0.90	712	3,117
CE-03	3E	CAT G3612LE Compressor Engine	3,550 bhp	3.91	17.14	21.52	94.27	7.12	31.19	2.03	8.91	4.8E-03	0.02	2.54	11.13	4,523	19,813
CE-04	4E	CAT G3612LE Compressor Engine	3,550 bhp	3.91	17.14	21.52	94.27	7.12	31.19	2.03	8.91	4.8E-03	0.02	2.54	11.13	4,523	19,813
CE-05	5E	CAT G3612LE Compressor Engine	3,550 bhp	3.91	17.14	21.52	94.27	7.12	31.19	2.03	8.91	4.8E-03	0.02	2.54	11.13	4,523	19,813
SSM	6E	Startup/Shutdown/Maintenance	na	---	---	---	---	---	13.12	---	---	---	0.40	---	1.51	---	5,604
RPC	7E	Rod Packing/Crankcase	na	---	---	---	---	3.49	15.27	0.05	0.22	0.10	0.43	0.37	1.60	1,107	4,849
GE-01	8E	Olympian G70LG EmGen Engine	118 bhp	0.93	0.23	29.10	7.28	0.38	0.10	3.1E-02	7.7E-03	1.4E-02	3.6E-03	0.05	0.01	168	42
H-01	9E	TXP1 Hot Oil Heater	10.0 MMBtu/hr	1.09	4.76	0.91	4.00	0.06	0.26	8.2E-04	3.6E-03	---	---	0.02	0.09	1,298	5,686
H-02	10E	TXP1 Regen Gas Heater	4.74 MMBtu/hr	0.52	2.26	0.43	1.90	0.03	0.12	3.9E-04	1.7E-03	---	---	0.01	0.04	615	2,695
H-03	11E	TXP2 Regen Gas Heater	6.60 MMBtu/hr	0.72	3.14	0.60	2.64	0.04	0.17	5.4E-04	2.4E-03	---	---	0.01	0.06	857	3,753
H-04	12E	TXP3 Regen Gas Heater	6.60 MMBtu/hr	0.72	3.14	0.60	2.64	0.04	0.17	5.4E-04	2.4E-03	---	---	0.01	0.06	857	3,753
H-05	13E	TXP2 Heat Medium Heater	21.22 MMBtu/hr	2.31	10.10	1.94	8.49	0.13	0.56	1.7E-03	7.6E-03	---	---	0.04	0.19	2,755	12,067
H-06	14E	TXP3 Heat Medium Heater	21.22 MMBtu/hr	2.31	10.10	1.94	8.49	0.13	0.56	1.7E-03	7.6E-03	---	---	0.04	0.19	2,755	12,067
DH-01	15E	Groves Dehydrator - Flash Tank/Still Ve	5.0 MMscfd	---	---	---	---	3.88	17.00	---	---	1.00	4.37	1.51	6.62	128	562
BLR-01	16E	Groves Dehydrator - Reboiler	0.20 MMBtu/hr	0.02	0.10	0.02	0.08	1.2E-03	0.01	1.6E-05	7.1E-05	---	---	4.1E-04	1.8E-03	26	114
FL-01	17E	Old Process Flare	5.0 MMscfy	---	---	---	---	373.33	4.38	---	---	10.67	0.13	53.33	0.63	225,467	2,642
FL-02	18E	New Process Flare	59.2 MMscfy	---	---	---	---	6,389.25	444.05	---	---	212.98	14.80	1,064.88	74.01	372,707	25,903
TLO	20E	Truck Load-Out - Prod H2O/Oil	600,000 bbl/yr	---	---	---	---	---	1.96	---	---	---	0.10	---	0.49	---	---
FUG	21E	Facility Process Piping Fugitives	na	---	---	---	---	26.32	115.28	13.39	58.67	---	---	---	---	840	3,679
T-03	22E	Prod. H2O Tank (9913 Tank)	400 bbl	---	---	---	---	0.23	1.01	---	---	0.01	0.05	0.06	0.25	---	---
T-04	23E	Prod. H2O Tank (9914 Tank)	400 bbl	---	---	---	---	0.23	1.01	---	---	0.01	0.05	0.06	0.25	---	---

TOTAL FACILITY-WIDE:	40.24	172.43	121.65	412.65	6,819.69	712.05	19.85	86.80	224.79	20.41	1,128.37	120.94	624,134	147,162
NNSR/PSD Threshold:		250		250		250		na		na		na		na
TVOP Threshold:		100		100		100		10		10		25		100,000

- Notes: 1 - Emission estimates are based on operation at 100% of rated load for 8,760 hr/yr, unless a Federally Enforceable Limitation (FEL) is established on hours of operation.
 2 - VOC is volatile organic compounds, as defined by EPA, and includes HCHO (formaldehyde).
 3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.
 4 - CO2e is aggregated Greenhouse Gas (GHG), comprised of carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O).

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Recovery Compressor Engine 01 - 225 bhp CAT G342NA (CE-01 (1E))

Unit ID (Point ID)	Description	Reference	Pollutant	Pre-Controlled Emissions			Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
CE-01 (1E)	Caterpillar (CAT) G342NA Engine 4SRB w/ NSCR	Vendor Specs	NOx	12.90	6.40	28.03	99.2%	0.10	0.05	0.22
		Vendor Specs	CO	13.70	6.80	29.77	85.4%	2.00	0.99	4.35
		Vendor Specs	THC	1.80	0.89	3.91	0.0%	1.80	0.89	3.91
	225 bhp	Est = 50% x THC	NMHC	0.90	0.45	1.96	0.0%	0.90	0.45	1.96
	1,200 rpm	Vendor Specs	NMNEHC	0.50	0.25	1.09	0.0%	0.50	0.25	1.09
	Manufacture Date: Before 06/12/06	NMNEHC+HCHO	VOC	0.75	0.37	1.63	25.3%	0.56	0.28	1.22
	NESHAP ZZZZ (Existing)	AP-42 Table 3.2-3	SO2	2.5E-03	1.2E-03	0.01	0.0%	2.5E-03	1.2E-03	0.01
		AP-42 Table 3.2-3	PM10/2.5	0.08	0.04	0.18	0.0%	0.08	0.04	0.18
	8,760 hr/yr	AP-42 Table 3.2-3	Benzene	0.01	3.4E-03	0.01	0.0%	0.01	3.4E-03	0.01
		AP-42 Table 3.2-3	Ethylbenzene	1.1E-04	5.3E-05	2.3E-04	0.0%	1.1E-04	5.3E-05	2.3E-04
		Vendor Specs (Est.)	HCHO	0.25	0.12	0.54	76.0%	0.06	0.03	0.13
	8,500 Btu/bhp-hr (LHV)	AP-42 Table 3.2-3	n-Hexane	---	---	---	0.0%	---	---	---
	9,424 Btu/bhp-hr (HHV)	AP-42 Table 3.2-3	Toluene	2.4E-03	1.2E-03	0.01	0.0%	2.4E-03	1.2E-03	0.01
	1.91 MMBtu/hr (LHV)	AP-42 Table 3.2-3	2,2,4-TMP	---	---	---	0.0%	---	---	---
	2.12 MMBtu/hr (HHV)	AP-42 Table 3.2-3	Xylenes	8.3E-04	4.1E-04	1.8E-03	0.0%	8.3E-04	4.1E-04	1.8E-03
	16,754 MMBtu/yr (LHV)	AP-42 Table 3.2-3	Other HAP	0.04	0.02	0.09	0.0%	0.04	0.02	0.09
	2,079 scf/hr	Sum	Total HAP	0.30	0.15	0.65	63.3%	0.11	0.05	0.24
	18.21 MMscf/yr	40CFR98 - Table C-1	CO2	503	249	1,093	0.0%	503	249	1,093
	920 Btu/scf (LHV)	Vendor Specs (THC)	CH4	1.80	0.89	3.91	0.0%	1.80	0.89	3.91
	1,020 Btu/scf (HHV)	40CFR98 - Table C-2	N2O	9.4E-04	4.7E-04	2.0E-03	0.0%	9.4E-04	4.7E-04	2.0E-03
	40CFR98 - Table A-1	CO2e	548	272	1,191	0.0%	548	272	1,191	

Notes: 1 - The emissions are based on operation at 100% of rated load for 8,760 hr/yr.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Recovery Compressor Engine 02 - 625 bhp CAT G398TA (CE-02 (2E))

Unit ID (Point ID)	Description	Reference	Pollutant	Pre-Controlled Emissions			Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
CE-02 (2E)	Caterpillar (CAT) G398TA Engine 4SRB w/ NSCR	Vendor Specs	NOx	9.80	13.50	59.14	94.9%	0.50	0.69	3.02
		Vendor Specs	CO	10.70	14.74	64.58	95.3%	0.50	0.69	3.04
		Vendor Specs	THC	0.80	1.10	4.83	20.0%	0.64	0.88	3.86
	625 bhp	Est = 50% x THC	NMHC	0.40	0.55	2.41	10.0%	0.32	0.44	1.93
		1,200 rpm	Vendor Specs	NMNEHC	0.20	0.28	1.21	80.0%	0.04	0.06
	Manufacture Date: Before 06/12/06	NMNEHC+HCHO	VOC	0.30	0.41	1.81	78.7%	0.06	0.09	0.39
		AP-42 Table 3.2-3	SO2	2.5E-03	3.4E-03	0.01	0.0%	2.5E-03	3.4E-03	0.01
	NESHAP ZZZZ (Existing)	AP-42 Table 3.2-3	PM10/2.5	0.08	0.11	0.49	0.0%	0.08	0.11	0.49
		AP-42 Table 3.2-3	Benzene	0.01	0.01	0.04	80.0%	1.3E-03	1.8E-03	0.01
	8,760 hr/yr	AP-42 Table 3.2-3	Ethylbenzene	1.0E-04	1.4E-04	6.3E-04	80.0%	2.1E-05	2.9E-05	1.3E-04
		Vendor Specs (Est.)	HCHO	0.10	0.14	0.60	76.0%	0.02	0.03	0.14
	8,387 Btu/bhp-hr (LHV)	AP-42 Table 3.2-3	n-Hexane	---	---	---	80.0%	---	---	---
	9,299 Btu/bhp-hr (HHV)	AP-42 Table 3.2-3	Toluene	2.4E-03	3.2E-03	0.01	80.0%	4.7E-04	6.5E-04	2.8E-03
	5.24 MMBtu/hr (LHV)	AP-42 Table 3.2-3	2,2,4-TMP	---	---	---	80.0%	---	---	---
	5.81 MMBtu/hr (HHV)	AP-42 Table 3.2-3	Xylenes	8.2E-04	1.1E-03	5.0E-03	80.0%	1.6E-04	2.3E-04	9.9E-04
	45,919 MMBtu/yr (LHV)	AP-42 Table 3.2-3	Other HAP	0.04	0.05	0.24	80.0%	0.01	0.01	0.05
	5,698 scf/hr	Sum	Total HAP	0.15	0.21	0.90	77.3%	0.03	0.05	0.20
	49.91 MMscf/yr	40CFR98 - Table C-1	CO2	496	684	2,995	0.0%	496	684	2,995
	920 Btu/scf (LHV)	Vendor Specs (THC)	CH4	0.80	1.10	4.83	0.0%	0.80	1.10	4.83
	1,020 Btu/scf (HHV)	40CFR98 - Table C-2	N2O	9.3E-04	1.3E-03	0.01	0.0%	9.3E-04	1.3E-03	0.01
	40CFR98 - Table A-1	CO2e	516	712	3,117	0.0%	516	712	3,117	

Notes: 1 - The emissions are based on operation at 100% of rated load for 8,760 hr/yr.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

• TXP1 Compressor Engines 03 thru 05 - 3,550 bhp CAT G3612LE (CE-03 (3E) thru CE-05 (5E))

Unit ID (Point ID)	Description	Reference	Pollutant	Pre-Controlled Emissions			Control Efficiency	Controlled Emissions			
				g/bhp-hr	lb/hr	tpy		g/bhp-hr	lb/hr	tpy	
CE-03 (3E) CE-04 (4E) CE-05 (5E)	Caterpillar (CAT) G3612LE Engine 4SLB w/ OxCat	Vendor Specs	NOx	0.50	3.91	17.14	0.0%	0.50	3.91	17.14	
		Vendor Specs	CO	2.75	21.52	94.27	90.0%	0.28	2.15	9.43	
		Vendor Specs	THC	6.46	50.56	221.45	5.0%	6.14	48.02	210.31	
	3,550 bhp	Vendor Specs	NMHC	1.82	14.24	62.39	17.9%	1.50	11.70	51.25	
		Vendor Specs	NMNEHC	0.65	5.09	22.28	50.0%	0.33	2.54	11.14	
	1,000 rpm	NMNEHC+HCHO	VOC	0.91	7.12	31.19	60.0%	0.36	2.85	12.48	
		Commenced Construction	AP-42 Table 3.2-2	SO2	2.0E-03	0.02	0.07	0.0%	2.0E-03	0.02	0.07
	After 06/12/06	NESHAP ZZZZ (New)	AP-42 Table 3.2-2	PM10/2.5	0.03	0.26	1.14	0.0%	0.03	0.26	1.14
		AP-42 Table 3.2-2	Benzene	1.5E-03	1.1E-02	0.05	50.0%	7.3E-04	0.01	0.03	
	8,760 hr/yr	AP-42 Table 3.2-2	Ethylbenzene	1.3E-04	1.0E-03	4.5E-03	50.0%	6.6E-05	5.2E-04	2.3E-03	
		Vendor Specs	HCHO	0.26	2.03	8.91	85.0%	0.04	0.31	1.34	
	6,629 Btu/bhp-hr (LHV)	AP-42 Table 3.2-2	n-Hexane	3.7E-03	0.03	0.13	50.0%	1.9E-03	0.01	0.06	
	7,350 Btu/bhp-hr (HHV)	AP-42 Table 3.2-2	Toluene	1.4E-03	0.01	0.05	50.0%	6.8E-04	5.3E-03	0.02	
	23.53 MMBtu/hr (LHV)	AP-42 Table 3.2-2	2,2,4-TMP	8.3E-04	0.01	0.03	85.0%	1.3E-04	9.8E-04	4.3E-03	
	26.09 MMBtu/hr (HHV)	AP-42 Table 3.2-2	Xylenes	6.1E-04	4.8E-03	0.02	50.0%	3.1E-04	2.4E-03	0.01	
	206,149 MMBtu/yr (LHV)	AP-42 Table 3.2-2	Other HAP	0.06	0.44	1.94	50.0%	0.03	0.22	0.97	
	25,579 scf/hr	Sum	Total HAP	0.32	2.54	11.13	78.1%	0.07	0.56	2.43	
	224.07 MMscf/yr	Vendor Specs	CO2	441	3,451	15,117	0.0%	441	3,451	15,117	
	920 Btu/scf (LHV)	Vendor Specs	CH4	5.47	42.81	187.51	0.0%	5.47	42.81	187.51	
	1,020 Btu/scf (HHV)	40CFR98 - Table C-2	N2O	7.3E-04	0.01	0.03	0.0%	7.3E-04	0.01	0.03	
	40CFR98 - Table A-1	CO2e	578	4,523	19,813	0.0%	578	4,523	19,813		

Notes: 1 - The emissions are based on operation at 100% of rated load for 8,760 hr/yr.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Startup/Shutdown/Maintenance (Including Blowdown) (SSM (6E))

Unit		No of Compressor Units	Total bhp	a. Engine "Cold-Start" Gas Volume scf/SSM	b. Blowdown Gas Volume scf/SSM	SSM and Blowdown Events/yr	Total Gas Vented MMscf/yr	CH4 35,000 (Inlet) 42,275 (Residue) lb/MMscf tpy	CO2e GWP = 25 tpy	VOC 15,000 (Inlet) 1,500 (Residue) lb/MMscf tpy	n-Hex, BTEX 400 (Inlet) 50 (Residue) lb/MMscf tpy	Total HAP 700 (Inlet) 250 (Residue) lb/MMscf tpy
CE-01 thru CE-02	a. Cold Start (Engines)	2	na	1,400	na	104	0.15	2.5	64	1.09	0.03	0.05
	b. Blowdown (Recip Comp)	2	850	na	5,283	104	0.55	9.6	240	4.12	0.11	0.19
CE-03 thru CE-05	a. Cold Start (Engines)	3	na	2,100	na	104	0.22	4.6	115	0.16	0.01	0.03
	b. Blowdown (Recip Comp)	3	10,650	na	66,192	104	6.88	145.5	3,638	5.16	0.17	0.86
CM-01	a. Cold Start (Electric Motor)	na	na	na	na	na	na	na	na	na	na	na
	b. Blowdown (Recip Comp)	1	750	na	4,661	12	0.06	1.0	24	0.42	0.01	0.02
CM-02 thru CM-07	a. Cold Start (Electric Motor)	na	na	na	na	na	na	na	na	na	na	na
	b. Blowdown (Recip Comp)	6	38,630	na	240,094	12	2.88	60.9	1,522	2.16	0.07	0.36

TOTAL FACILITY-WIDE PRE-CONTROLLED SSM EMISSIONS:		224	5,604	13.12	0.40	1.51
BLOWDOWN EMISSIONS FROM CM-02 THRU CM-07 CONTROLLED BY OLD FLARE (FL-01):	98%	1.2	30	0.04	1.4E-03	0.01
TOTAL FACILITY-WIDE CONTROLLED SSM EMISSIONS:		164	4,112	11.00	0.33	1.16

- Notes: 1 - SSM Emissions are the sum of: a. Unburned fuel resulting from "cold-start" of idle gas-fired engines and b. Natural gas that is purged (aka blowdown) from the compressors and associated piping and equipment.
 2 - CM-01 and CM-02 thru CM-07 are gas compressors driven by electric motors. CM-01 is the Columbia compressor, CM-02 thru CM-07 are the residue gas compressors.
 3 - Starting Gas Quantity and Blowdown (B-D) Gas Quantity as per Engineering Department.
 (e.g., 8,577 scf/B-D of a compressor with a 1,380 bhp engine equals 6.22 scf/bhp/B-D.)

Engines	a. Unburned "Cold-Start" Gas is Constant at:	700 scf/start
	b. Blowdown Gas is Related to bhp at:	6.22 scf/bhp/B-D

4 - To be conservative, the following gas characteristics were assumed:

Pollutant	Inlet Gas Analysis	Estimated	Residue Gas Analysis	Estimated
Carbon Dioxide	218.85 lb/MMscf	500.00 lb/MMscf	204.24 lb/MMscf	500.00 lb/MMscf
Methane	31,049.24 lb/MMscf	35,000.00 lb/MMscf	35,943.91 lb/MMscf	42,275.00 lb/MMscf
VOC (Propane)	11,266.81 lb/MMscf	15,000.00 lb/MMscf	773.24 lb/MMscf	1,500.00 lb/MMscf
n-Hexane	117.63 lb/MMscf	400.00 lb/MMscf	--- lb/MMscf	50.00 lb/MMscf
Benzene	1.65 lb/MMscf	75.00 lb/MMscf	--- lb/MMscf	50.00 lb/MMscf
Toluene	3.16 lb/MMscf	75.00 lb/MMscf	--- lb/MMscf	50.00 lb/MMscf
Ethylbenzene	0.00 lb/MMscf	75.00 lb/MMscf	--- lb/MMscf	50.00 lb/MMscf
Xylenes	0.00 lb/MMscf	75.00 lb/MMscf	--- lb/MMscf	50.00 lb/MMscf
Total HAP:	122.44 lb/MMscf	700.00 lb/MMscf	--- lb/MMscf	250.00 lb/MMscf

5 - Emission estimates are conservatively based on:

2.0
2.0

Starts-Stops per week per Engine.

Blowdown(s) per week per Compressor (except electrically driven compressors, see above).

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Compressor Rod Packing and Engine Crankcase (RPC (7E))

Compressor Rod Packing Leaks (Natural Gas)

Unit Description	No. of Recip Compressors	Cyl per Recip Compressor	scfh per Cylinder	Contingency	Total Leak Rate MMscf/yr	VOC		HCHO		n-Hex,BTEX (Ea)		Total HAP		CO2		CH4		CO2e	
						15,000 (Inlet) 1,500 (Residue)		na na		400 (Inlet) 50 (Residue)		700 (Inlet) 250 (Residue)		500 (Inlet) 500 (Residue)		35,000 (Inlet) 42,275 (Residue)		875,500 (Inlet) 1,057,375 (Residue)	
						lb/MMscf	tpy	lb/MMscf	tpy	lb/MMscf	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Rod Packing - CM-01(Inlet)	1	2	15	15%	0.30	0.52	2.27	na	na	0.01	0.06	0.02	0.11	0.02	0.08	1	5	30	132
Rod Packing - CE-04 (inlet)	1	4	15	15%	0.60	1.04	4.53	na	na	0.03	0.12	0.05	0.21	0.03	0.15	2	11	60	265
Rod Packing - CE-05 (Inlet)	1	2	15	15%	0.30	0.52	2.27	na	na	0.01	0.06	0.02	0.11	0.02	0.08	1	5	30	132
Rod Packing - CM-02 thru -07	6	6	15	15%	5.44	0.93	4.08	na	na	0.03	0.14	0.16	0.68	0.31	1.36	26	115	657	2,876
Rod Packing - CE-01 thru -03	3	4	15	15%	1.81	0.31	1.36	na	na	0.01	0.05	0.05	0.23	0.10	0.45	9	38	219	959

*Residue (aka, Outlet) Gas - CM-02 thru -07 and CE-01 thru -03

Crankcase Emissions (Combustion Gas from CE-01 thru -05)

Unit Description	Total Effective (Prorated for hr/yr) Recip Horsepower (bhp)	Leak Rate 0.50 scf/bhp-hr MMscf/yr	Safety Factor	VOC		HCHO		n-Hex,BTEX (Ea)		Total HAP		CO2		CH4		CO2e	
				lb/MMscf	tpy	lb/MMscf	tpy	lb/MMscf	tpy	lb/MMscf	tpy	lb/MMscf	tpy	lb/MMscf	tpy	lb/MMscf	tpy
Crankcase Emissions	11,500	50.37	250%	0.17	0.76	0.05	0.22	2.5E-03	0.01	0.06	0.27	85	370	1	5	111	485

Total RPC Emissions:

VOC		HCHO		n-Hex,BTEX (Ea)		Total HAP		CO2		CH4		CO2e	
lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
3.49	15.27	0.05	0.22	0.10	0.43	0.37	1.60	85	372	41	179	1,107	4,849

Notes: 1 - Misc. equipment leaks is a broad category covering leaks of natural gas from sealed surfaces, such as packing and gaskets, resulting from the wear of mechanical joints, seals, and rotating surfaces over time. It also includes the crankcase emissions from reciprocating engines.

2 - To be conservative, and to account for potential future changes, the following "worst-case" gas characteristics were assumed:

Pollutant	Worst-Case Assumption (Inlet)	Worst-Case Assumption (Outlet)
CO2	500 lb/MMscf	500 lb/MMscf
CH4	35,000 lb/MMscf	42,275 lb/MMscf
VOC	15,000 lb/MMscf	1,500 lb/MMscf
BTEX,n-hex (ea)	400 lb/MMscf	50 lb/MMscf
Total HAP	700 lb/MMscf	250 lb/MMscf

3 - Estimates of Recip Compressor Leaks are based on vendor data w/ an appropriate contingency.

4 - Total Effective Recip BHP is determined as follows:

Unit ID	Utilization	BHP	Prorated
CE-01	8,760 hr/yr	225	225
CE-02	8,760 hr/yr	625	625
CE-03	8,760 hr/yr	3,550	3,550
CE-04	8,760 hr/yr	3,550	3,550
CE-05	8,760 hr/yr	3,550	3,550
TOTAL		11,500	11,500

5 - Engine crankcase emissions are based on vendor data: "As a general rule, blow-by (i.e., crankcase emissions) on a new engine is approximately 0.5 scf/bhp-hr." A "safety factor" is used to account for increasing blow-by as the engines "wear".

6 - Crankcase emissions are estimated as follows:

(Data from CAT G3612 Data Sheet and Emissions Calculation Spreadsheet.)

Tot Eng Exhaust (TEEx) (Vol) 24,053 acf/min 5,143 MMscf/yr TEEx*

Pollutant	G3612LE PTE	Crankcase Emission Factor**
Crankcase THC emissions (Mass)	221.45 tpy THC	86.12 lb THC / MMscf TEEx
Crankcase VOC emissions (Mass)	31.19 tpy VOC	12.13 lb VOC / MMscf TEEx
Crankcase HCHO emissions (Mass)	8.91 tpy HCHO	3.47 lb HCHO / MMscf TEEx
Crankcase BTEX (ea) emissions (Ma:	0.44 tpy BTEX	0.17 lb BTEX / MMscf TEEx
Crankcase HAP (tot) emissions (Mas:	11.13 tpy HAP	4.33 lb HAP / MMscf TEEx
Crankcase CO2 emissions (Mass)	15,117 tpy CO2	5,879 lb CO2 / MMscf TEEx
Crankcase CH4 emissions (Mass)	188 tpy CH4	73 lb CH4 / MMscf TEEx
Crankcase CO2e emissions (Mass)	19,813 tpy CO2e	7,705 lb CO2e / MMscf TEEx

* Conversion from acf/min to scf/yr based 838 oF exhaust temp, and 68 oF std temp.

** Crankcase EmFact = PTE (tpy) from G3612LE ÷ Tot Engine Exhaust (TEEx) (MMsf/yr).

7 - There are a total of 12 gas compressors; two are inlet gas compressors driven by the CAT G342NA and G398TA engines (CE-01 and -02), three are residue gas compressors driven by CAT G3612LE engines (CE-03 thru -05), one is an inlet gas compressor (Columbia) that is electrically driven (CM-01), and six are electrically driven residue gas compressors (CM-02 thru -07).

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Emergency Generator Engine - 118 bhp Olympian G70LG (GE-01 (8E))

Unit ID (Point ID)	Description	Reference	Pollutant	Pre-Controlled Emissions			Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
GE-01 (8E)	Olympian G70LG (4SRB) 4SRB - EPA Certified	Vendor Data	NOx	3.55	0.93	0.23	0.0%	3.55	0.93	0.23
		Vendor Data	CO	111.49	29.10	7.28	0.0%	111.49	29.10	7.28
	118 bhp	Vendor Data	THC	1.46	0.38	0.10	0.0%	1.46	0.38	0.10
		Conservative Est.	NMHC	1.46	0.38	0.10	0.0%	1.46	0.38	0.10
	1,800 rpm	Conservative Est.	NMNEHC	1.46	0.38	0.10	0.0%	1.46	0.38	0.10
	Manufacture Date:	Conservative Est.	VOC	1.46	0.38	0.10	0.0%	1.46	0.38	0.10
	After 01/01/09	Conservative Est.	VOC	1.46	0.38	0.10	0.0%	1.46	0.38	0.10
	NSPS Affected	AP-42 Table 3.2-3	SO2	2.3E-03	8.9E-04	2.2E-04	0.0%	2.3E-03	8.9E-04	2.2E-04
	NESHAP ZZZZ (New)	AP-42 Table 3.2-3	PM10/2.5	0.07	0.03	0.01	0.0%	0.07	0.03	0.01
	500 hr/yr	AP-42 Table 3.2-3	Benzene	0.01	2.4E-03	6.0E-04	0.0%	0.01	2.4E-03	0.00
		AP-42 Table 3.2-3	Ethylbenzene	9.6E-05	3.7E-05	9.4E-06	0.0%	9.6E-05	3.7E-05	9.4E-06
		AP-42 Table 3.2-3	HCHO	0.08	0.03	0.01	0.0%	0.08	0.03	0.01
	7,650 Btu/bhp-hr (LHV)	AP-42 Table 3.2-3	n-Hexane	---	---	---	---	---	---	---
	8,500 Btu/bhp-hr (HHV)	AP-42 Table 3.2-3	Toluene	2.2E-03	8.4E-04	2.1E-04	0.0%	2.2E-03	8.4E-04	2.1E-04
	0.91 MMBtu/hr (LHV)		Toluene	---	---	---	100.0%	---	---	---
	1.01 MMBtu/hr (HHV)	AP-42 Table 3.2-3	Xylenes	7.5E-04	2.9E-04	7.4E-05	0.0%	7.5E-04	2.9E-04	7.4E-05
	453 MMBtu/yr (LHV)	AP-42 Table 3.2-3	Other HAP	0.04	0.01	3.6E-03	0.0%	0.04	0.01	3.6E-03
	985 scf/hr	Sum	Total HAP	0.12	0.05	0.01	0.0%	0.12	0.05	0.01
	0.49 MMscf/yr	40CFR98 Table C-1	CO2	522	136	34	0.0%	522	136	34
	920 Btu/scf (LHV)	AP-42 Table 3.2-3	CH4	4.82	1.26	0.31	0.0%	4.82	1.26	0.31
1,020 Btu/scf (HHV)	40CFR98 Table C-1	N2O	5.1E-03	1.3E-03	3.3E-04	0.0%	5.1E-03	1.3E-03	3.3E-04	
	40CFR98 Table C-1	CO2e	644	168	42	0.0%	644	168	42	

- Notes:
- 1 - The emission estimates are based on operation at 100% of rated load for operation of 500 hours per year.
 - 2 - The generator set will burn propane or natural gas fuel.
 - 3 - PM10/2.5 is Filterable and Condensable Particulate Matter; including PM10 and PM2.5
 - 4 - HCHO is Formaldehyde; Total HAP includes HCHO, Acetaldehyde, Acrolein, BTEX (Benzene, Toluene, Ethylbenzene, Xylene), Methanol, and n-Hexane.
 - 5 - NOx, CO and VOC emissions are based on vendor data and are the highest numbers for wither natural gas or propane. Other pollutant emissions are based on EPA AP-42 or 40 CFR Part 98.
 - 6 - SO2, PM and HAP emissions are based on EPA AP-42 emission factors for an uncontrolled four-stroke rich-burn engine.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

TXP1 Hot Oil Heater - 10.0 MMBtu/hr (H-01 (9E))

Unit ID (Point ID)	Description	Reference	Pollutant	Emission Factor		Pre-Controlled Emissions		Control Efficiency %	Controlled Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy		lb/hr	tpy
H-01 (9E)	TXP1 Hot Oil Heater 10.00 MMBtu/hr (LHV) 11.09 MMBtu/hr (HHV)	EPA AP-42 Table 1.4-2	NOX	100.00	0.10	1.09	4.76	na	1.09	4.76
		EPA AP-42 Table 1.4-2	CO	84.00	0.08	0.91	4.00	na	0.91	4.00
		EPA AP-42 Table 1.4-2	THC	11.00	0.01	0.12	0.52	na	0.12	0.52
		EPA AP-42 Table 1.4-2	NMHC	8.75	0.01	0.09	0.41	na	0.09	0.41
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	0.01	0.06	0.27	na	0.06	0.27
		EPA AP-42 Table 1.4-2	VOC	5.50	0.01	0.06	0.26	na	0.06	0.26
		EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	0.01	2.9E-02	na	0.01	0.03
	8,760 hr/yr	EPA AP-42 Table 1.4-2	PM10/2.5	7.60	0.01	0.08	0.36	na	0.08	0.36
		EPA AP-42 Table 1.4-3	Benzene	2.1E-03	2.06E-06	2.3E-05	1.0E-04	na	2.3E-05	1.0E-04
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	HCHO	0.08	7.35E-05	8.2E-04	3.6E-03	na	8.2E-04	3.6E-03
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	0.02	0.09	na	0.02	0.09
		EPA AP-42 Table 1.4-3	Toluene	3.4E-03	3.33E-06	3.7E-05	1.6E-04	na	3.7E-05	1.6E-04
		EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	Xylenes	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	Other HAP	1.9E-03	1.86E-06	2.1E-05	9.0E-05	na	2.1E-05	9.0E-05
		EPA AP-42 Table 1.4-3	Total HAP	1.88	1.85E-03	0.02	0.09	na	0.02	0.09
		10,870 scf/hr 260.87 Mscfd 95.22 MMscf/yr 920 Btu/scf (LHV) 1,020 Btu/scf (HHV)	40CFR98 - Table C-1	CO2	119,317	117	1,297	5,681	na	1,297
40CFR98 - Table C-2	CH4		2.25	2.2E-03	0.02	0.11	na	0.02	0.11	
40CFR98 - Table C-2	N2O		0.22	2.2E-04	2.4E-03	0.01	na	2.4E-03	0.01	
40CFR98 - Table A-1	CO2e		119,440	117	1,298	5,686	na	1,298	5,686	

Notes: 1 - The fuel heating value will vary, 920 Btu/scf (LHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.
 2 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

TXP1 Regenerator Gas Heater - 4.74 MMBtu/hr (H-02 (10E))

Unit ID (Point ID)	Description	Reference	Pollutant	Emission Factor		Pre-Controlled Emissions		Control Efficiency %	Controlled Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy		lb/hr	tpy
H-02 (10E)	TXP1 Regen Gas Heater 4.74 MMBtu/hr (LHV) 5.26 MMBtu/hr (HHV) 8,760 hr/yr 5,152 scf/hr 123.65 Mscfd 45.13 MMscf/yr 920 Btu/scf (LHV) 1,020 Btu/scf (HHV)	EPA AP-42 Table 1.4-2	NOx	100.00	0.10	0.52	2.26	na	0.52	2.26
		EPA AP-42 Table 1.4-2	CO	84.00	0.08	0.43	1.90	na	0.43	1.90
		EPA AP-42 Table 1.4-2	THC	11.00	0.01	0.06	0.25	na	0.06	0.25
		EPA AP-42 Table 1.4-2	NMHC	8.75	0.01	0.04	0.20	na	0.04	0.20
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	0.01	0.03	0.13	na	0.03	0.13
		EPA AP-42 Table 1.4-2	VOC	5.50	0.01	0.03	0.12	na	0.03	0.12
		EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	3.1E-03	0.01	na	3.1E-03	0.01
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	0.01	0.04	0.17	na	0.04	0.17
		EPA AP-42 Table 1.4-3	Benzene	2.1E-03	2.06E-06	1.1E-05	4.7E-05	na	1.1E-05	4.7E-05
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	HCHO	0.08	7.35E-05	3.9E-04	1.7E-03	na	3.9E-04	1.7E-03
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	0.01	0.04	na	0.01	0.04
		EPA AP-42 Table 1.4-3	Toluene	3.4E-03	3.33E-06	1.8E-05	7.7E-05	na	1.8E-05	7.7E-05
		EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	---	---	---	---	---
	EPA AP-42 Table 1.4-3	Xylenes	---	---	---	---	---	---	---	
	EPA AP-42 Table 1.4-3	Other HAP	1.9E-03	1.86E-06	9.8E-06	4.3E-05	na	9.8E-06	4.3E-05	
	EPA AP-42 Table 1.4-3	Total HAP	1.88	1.85E-03	0.01	0.04	na	0.01	0.04	
	40CFR98 - Table C-1	CO2	119,317	117	615	2,693	na	615	2,693	
40CFR98 - Table C-2	CH4	2.25	2.2E-03	0.01	0.05	na	0.01	0.05		
40CFR98 - Table C-2	N2O	0.22	2.2E-04	1.2E-03	5.1E-03	na	1.2E-03	5.1E-03		
40CFR98 - Table A-1	CO2e	119,440	117	615	2,695	na	615	2,695		

Notes: 1 - The fuel heating value will vary, 920 Btu/scf (LHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.
 2 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

TXP2 and TXP3 Regenerator Gas Heater - 6.60 MMBtu/hr (H-03 (11E) and H-04 (12E))

Unit ID (Point ID)	Description	Reference	Pollutant	Emission Factor		Pre-Controlled Emissions		Control Efficiency %	Controlled Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy		lb/hr	tpy
H-03 (11E) and H-04 (12E)	TXP2 Regen Gas Heater and TXP3 Regen Gas Heater	EPA AP-42 Table 1.4-2	NOX	100.00	0.10	0.72	3.14	na	0.72	3.14
		EPA AP-42 Table 1.4-2	CO	84.00	0.08	0.60	2.64	na	0.60	2.64
		EPA AP-42 Table 1.4-2	THC	11.00	0.01	0.08	0.35	na	0.08	0.35
		EPA AP-42 Table 1.4-2	NMHC	8.75	0.01	0.06	0.27	na	0.06	0.27
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	0.01	0.04	0.18	na	0.04	0.18
	6.60 MMBtu/hr (LHV) (ea) 7.32 MMBtu/hr (HHV) (ea)	EPA AP-42 Table 1.4-2	VOC	5.50	0.01	0.04	0.17	na	0.04	0.17
		EPA AP-42 Table 1.4-2	SO2	0.60	0.00	4.3E-03	1.9E-02	na	4.3E-03	0.02
	8,760 hr/yr	EPA AP-42 Table 1.4-2	PM10/2.5	7.60	0.01	0.05	0.24	na	0.05	0.24
		EPA AP-42 Table 1.4-3	Benzene	2.1E-03	2.06E-06	1.5E-05	6.6E-05	na	1.5E-05	6.6E-05
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	HCHO	0.08	7.35E-05	5.4E-04	2.4E-03	na	5.4E-04	2.4E-03
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	0.01	0.06	na	0.01	0.06
		EPA AP-42 Table 1.4-3	Toluene	3.4E-03	3.33E-06	2.4E-05	1.1E-04	na	2.4E-05	1.1E-04
		EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	Xylenes	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	Other HAP	1.9E-03	1.86E-06	1.4E-05	6.0E-05	na	1.4E-05	6.0E-05
		EPA AP-42 Table 1.4-3	Total HAP	1.88	1.85E-03	0.01	0.06	na	0.01	0.06
	7,174 scf/hr 172.17 Mscfd 62.84 MMscf/yr 920 Btu/scf (LHV) 1,020 Btu/scf (HHV)	40CFR98 - Table C-1	CO2	119,317	117	856	3,749	na	856	3,749
40CFR98 - Table C-2		CH4	2.25	2.2E-03	0.02	0.07	na	0.02	0.07	
40CFR98 - Table C-2		N2O	0.22	2.2E-04	1.6E-03	7.1E-03	na	1.6E-03	7.1E-03	
40CFR98 - Table A-1		CO2e	119,440	117	857	3,753	na	857	3,753	

Notes: 1 - The fuel heating value will vary, 920 Btu/scf (LHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.
 2 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

TXP2 and TXP3 Heat Medium Heater - 21.22 MMBtu/hr (H-05 (13E) and H-06 (14E))

Unit ID (Point ID)	Description	Reference	Pollutant	Emission Factor		Pre-Controlled Emissions		Control Efficiency %	Controlled Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy		lb/hr	tpy
H-05 (13E) and H-06 (14E)	TXP2 Heat Medium Heater and TXP3 Heat Medium Heater 21.22 MMBtu/hr (LHV) (ea) 23.53 MMBtu/hr (HHV) (ea) 8,760 hr/yr 23,065 scf/hr 553.57 Mscfd 202.05 MMscf/yr 920 Btu/scf (LHV) 1,020 Btu/scf (HHV)	Vendor Data	NOX	100.00	0.10	2.31	10.10	na	2.31	10.10
		Vendor Data	CO	84.00	0.08	1.94	8.49	na	1.94	8.49
		EPA AP-42 Table 1.4-2	THC	11.00	0.01	0.25	1.11	na	0.25	1.11
		EPA AP-42 Table 1.4-2	NMHC	8.75	0.01	0.20	0.88	na	0.20	0.88
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	0.01	0.13	0.57	na	0.13	0.57
		EPA AP-42 Table 1.4-2	VOC	5.50	0.01	0.13	0.56	na	0.13	0.56
		EPA AP-42 Table 1.4-2	SO2	0.60	0.00	0.01	0.06	na	0.01	0.06
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	0.01	0.18	0.77	na	0.18	0.77
		EPA AP-42 Table 1.4-3	Benzene	2.1E-03	2.06E-06	4.8E-05	2.1E-04	na	4.8E-05	2.1E-04
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	HCHO	0.08	7.35E-05	1.7E-03	7.6E-03	na	1.7E-03	7.6E-03
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	0.04	0.18	na	0.04	0.18
		EPA AP-42 Table 1.4-3	Toluene	3.4E-03	3.33E-06	7.8E-05	3.4E-04	na	7.8E-05	3.4E-04
		EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	Xylenes	---	---	---	---	---	---	---
	EPA AP-42 Table 1.4-3	Other HAP	1.9E-03	1.86E-06	4.4E-05	1.9E-04	na	4.4E-05	1.9E-04	
	EPA AP-42 Table 1.4-3	Total HAP	1.88	1.85E-03	0.04	0.19	na	0.04	0.19	
	40CFR98 - Table C-1	CO2	119,317	117	2,752	12,054	na	2,752	12,054	
40CFR98 - Table C-2	CH4	2.25	2.2E-03	0.05	0.23	na	0.05	0.23		
40CFR98 - Table C-2	N2O	0.22	2.2E-04	0.01	0.02	na	0.01	0.02		
40CFR98 - Table A-1	CO2e	119,440	117	2,755	12,067	na	2,755	12,067		

Notes: 1 - The fuel heating value will vary, 920 Btu/scf (LHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.
 2 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Groves Dehydrator Flash Tank and Still Vent - 5.0 MMscfd (DH-01 (15E))

Unit ID	Description	Reference	Pollutant	Emission Factor		Pre-Recycle Emissions		Recycle	Post-Recycle Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy	%	lb/hr	tpy
DH-01 (15E)	Dehydrator 01 (No Combustion Emissions Shown) (See BLR-01)	See BLR-01	NOX	---	---	---	---	---	---	---
		See BLR-01	CO	---	---	---	---	---	---	---
		GRI-GLYCalc 4.0	THC	---	---	19.75	86.49	44.5%	10.96	48.00
		GRI-GLYCalc 4.0	NMHC	---	---	5.82	25.51		5.82	25.51
		GRI-GLYCalc 4.0	NMNEHC	---	---	5.77	25.28	32.8%	3.88	17.00
		GRI-GLYCalc 4.0	VOC	---	---	5.77	25.28	32.8%	3.88	17.00
	5.0 MMscfd	See BLR-01	SO2	---	---	---	---	---	---	---
		See BLR-01	PM10/2.5	---	---	---	---	---	---	---
	8,760 hr/yr	GRI-GLYCalc 4.0	Benzene	---	---	0.08	0.34	7.2%	0.07	0.31
		GRI-GLYCalc 4.0	Ethylbenzene	---	---	---	---	---	---	---
		See BLR-01	HCHO	---	---	---	---	---	---	---
		GRI-GLYCalc 4.0	n-Hexane	---	---	0.11	0.50	40.4%	0.07	0.30
		GRI-GLYCalc 4.0	Toluene	---	---	0.32	1.41	5.0%	0.31	1.34
		GRI-GLYCalc 4.0	2,2,4-TMP	---	---	---	---	---	---	---
	0.21 MMscf/hr 1,825 MMscf/yr	GRI-GLYCalc 4.0	Xylenes	---	---	1.00	4.37	2.3%	0.98	4.27
		GRI-GLYCalc 4.0	Other HAP	---	---	---	---	---	---	---
	NESHAP HH - Exempt	GRI-GLYCalc 4.0	Total HAP	---	---	1.51	6.62	6.0%	1.42	6.22
		See BLR-01	CO2	---	---	---	---	---	---	---
GRI-GLYCalc 4.0		CH4	---	---	10	45	49.6%	5	22	
See BLR-01		N2O	---	---	---	---	---	---	---	
40CFR98 - Table A-1		CO2e	---	---	255	1,116	49.6%	128	562	

- Notes: 1 - Dehydrator flash tank off-gases are usually burned as fuel in the reboiler. However, to be conservative, it is estimated 50% of the flash tank off-gases are used as reboiler fuel.
 2 - To be conservative, and to account for potential future changes in gas quality, the following worst-case emissions were assumed:

5.0 MMscfd Dehydrator 01	GRI-GLYCalc 4.0*	Worst-Case Assumption	*Dehydrator Operating Parameters (See Attachment N)			
THC	40.00 tpy	48.00 tpy	Flow Rate:	5.0 MMscfd	Gas Analysis:	Groves Master - 08/13/13
NMHC	21.25 tpy	25.51 tpy	Wet Gas Temperature:	72 oF	Flash Tank Temperature:	150 oF
NMNEHC = VOC	14.16 tpy	17.00 tpy	Wet Gas Pressure:	836 psig	Flash Tank Pressure:	50 psia
Benzene	0.26 tpy	0.31 tpy	Wet Gas Water Content:	Saturated	Flash Tank Off-Gas Control:	50% Recycle
Ethylbenzene	--- tpy	--- tpy	Dry Gas Water Content:	7.0 lb H2O/MMscf	Stripping Gas:	na
HCHO	--- tpy	--- tpy	Lean Glycol Water Content:	1.5 wt% H2O	Condenser Temperature:	na
n-Hexane	0.25 tpy	0.30 tpy	Glycol Circulation Rate:	0.67 gpm	Condenser Pressure:	na
Toluene	1.11 tpy	1.34 tpy	Glycol Pump:	Gas Injection	Regen/Cond Off-Gas Control:	na
Xylenes	3.56 tpy	4.27 tpy	Additional Model Results:			
Other HAP	--- tpy	--- tpy	Glycol Recirculation Ratio:	7.1 gal/lb-H2O	Flash Tank Off-Gas Flow:	262 scfh
Total HAP	5.19 tpy	6.22 tpy	Rich Glycol Water Content:	2.8 gal/lb-H2O	Regen/Cond Off-Gas Flow:	128 scfh
CH4	18.75 tpy	22.50 tpy				

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Groves Dehydrator Reboiler - 0.20 MMBtu/hr (BLR-01 (16E))

Unit ID	Description	Reference	Pollutant	Emission Factor		Pre-Controlled Emissions		Control Efficiency	Controlled Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy		%	lb/hr
BLR-01 (16E)	Reboiler 01 (Combustion Only)	EPA AP-42 Table 1.4-1	NOX	100.00	0.10	0.02	0.10	na	0.02	0.10
		EPA AP-42 Table 1.4-1	CO	84.00	0.08	0.02	0.08	na	0.02	0.08
		EPA AP-42 Table 1.4-2	THC	11.00	0.01	2.4E-03	0.01	na	2.4E-03	0.01
		EPA AP-42 Table 1.4-2	NMHC	8.75	8.53E-03	1.9E-03	8.3E-03	na	1.9E-03	8.3E-03
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	5.49E-03	1.2E-03	5.3E-03	na	1.2E-03	5.3E-03
		EPA AP-42 Table 1.4-2	VOC	5.50	5.39E-03	1.2E-03	5.2E-03	na	1.2E-03	5.2E-03
		EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	1.3E-04	5.7E-04	na	1.3E-04	5.7E-04
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	7.45E-03	1.7E-03	7.2E-03	na	1.7E-03	7.2E-03
		EPA AP-42 Table 1.4-3	Benzene	2.1E-03	2.06E-06	4.6E-07	2.0E-06	na	4.6E-07	2.0E-06
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	HCHO	0.08	7.35E-05	1.6E-05	7.1E-05	na	1.6E-05	7.1E-05
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	3.9E-04	1.7E-03	na	3.9E-04	1.7E-03
		EPA AP-42 Table 1.4-3	Toluene	3.4E-03	3.33E-06	7.4E-07	3.2E-06	na	7.4E-07	3.2E-06
		EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	---	---	---	---	---
	217 scf/hr	EPA AP-42 Table 1.4-3	Xylenes	---	---	---	---	---	---	
	5.22 Mscfd	EPA AP-42 Table 1.4-3	Other HAP	1.9E-03	1.86E-06	4.1E-07	1.8E-06	na	4.1E-07	1.8E-06
	1.90 MMscf/yr	EPA AP-42 Table 1.4-3	Total HAP	1.88	1.85E-03	4.1E-04	1.8E-03	na	4.1E-04	1.8E-03
	920 Btu/scf (LHV)	40CFR98 - Table C-1	CO2	119,317	117	26	114	na	26	114
	1,020 Btu/scf (HHV)	40CFR98 - Table C-2	CH4	2.25	2.2E-03	4.9E-04	2.1E-03	na	4.9E-04	2.1E-03
		40CFR98 - Table C-2	N2O	0.22	2.2E-04	4.9E-05	2.1E-04	na	4.9E-05	2.1E-04
	40CFR98 - Table A-1	CO2e	119,440	117	26	114	na	26	114	

- Notes: 1 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.
 2 - The fuel heating value will vary, 920 Btu/scf (LHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)
Old Process Flare (FL-01 (17E))

Unit ID (Point ID)	Description	Reference	Pollutant	Emission Factor		Pre-Controlled Emissions		Control Efficiency %	Controlled Emissions		
				lb/MMscf	lb/MMBtu	lb/hr	tpy		lb/hr	tpy	
FL-01 (17E)	TCI 4800 Old Process Flare (Waste Gas and Combustion)	EPA AP-42 Table 13.5-1	NOX	76.50	0.07	---	---	---	16.32	0.19	
		EPA AP-42 Table 13.5-1	CO	416.25	0.37	---	---	---	88.80	1.04	
	98% Control Efficiency	Mass Balance	THC	56,525	---	12,058.67	141.31	98.0%	241.17	2.83	
		Mass Balance	NMHC	14,250	---	3,040.00	35.63	98.0%	60.80	0.71	
		Mass Balance	NMNEHC	1,750	---	373.33	4.38	98.0%	7.47	0.09	
		Mass Balance	VOC	1,750	---	373.33	4.38	98.0%	7.47	0.09	
		240.00 MMBtu/hr (HHV) (max) 0.58 MMBtu/hr (LHV) (ave) 0.64 MMBtu/hr (HHV) (ave)	EPA AP-42 Table 1.4-2	SO2	0.66	5.88E-04	---	---	---	0.14	1.7E-03
			EPA AP-42 Table 1.4-2	PM10/2.5	8.38	7.45E-03	---	---	---	1.79	0.02
	8,760 hr/yr	Mass Balance	Benzene	50	---	10.67	0.13	98.0%	0.21	2.5E-03	
		Mass Balance	Ethylbenzene	50	---	10.67	0.13	98.0%	0.21	2.5E-03	
		Mass Balance	HCHO	---	---	---	---	---	---	---	
		Mass Balance	n-Hexane	50	---	10.67	0.13	98.0%	0.21	2.5E-03	
		5.00 MMscf/yr	Mass Balance	Toluene	50	---	10.67	0.13	98.0%	0.21	2.5E-03
			Mass Balance	2,2,4-TMP	---	---	---	---	---	---	---
	Mass Balance		Xylenes	50	---	10.67	0.13	98.0%	0.21	2.5E-03	
	571 scf/hr (ave) 13.70 Mscfd (ave)	Mass Balance	Other HAP	---	---	---	---	---	---	---	
	1,012 Btu/scf (LHV) - avg 1,125 Btu/scf (HHV) - avg	Mass Balance	Total HAP	250	---	53.33	0.63	98.0%	1.07	0.01	
		40CFR98 - Table C-1	CO2	135,764	120.68	---	---	---	28,963	339	
		Mass Balance	CH4	42,275	116.98	9,018.67	105.69	98.0%	180.37	2.11	
		40CFR98 - Table C-2	N2O	0.25	2.2E-04	---	---	---	1.4E-04	6.2E-04	
40CFR98 - Table A-1		CO2e	1,192,713	3,045	225,467	2,642	85.2%	33,472	392		

- Notes:
- 1 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.
 - 2 - Flare design capacity and short-term (lb/hr) emissions are based on all electrically driven TXP2/TXP3 residue gas compressors blowing down to the flare at the same time.
 - 3 - Waste gas composition and CO2 emission factors determined as follows:

Component	Waste Gas (to Flare)						GHG (40CFR98)		
	Mol% (Vol%)	MMscf/yr	scf/hr	Btu/scf (LHV)	MMBtu/hr	lb/MMscf	Wgt%	kg/MMBtu	lb/MMBtu
Nitrogen	0.0%	0.00	0.00	0	---	---	0.6%	---	---
Carbon Dioxide	0.0%	0.00	0.00	0	---	---	0.4%	---	---
Methane	84.7%	4.23	483.33	909	0.44	42,275	74.7%	53.06	116.98
Ethane	14.1%	0.70	80.43	1,619	0.13	12,500	23.3%	59.60	131.40
VOC (Non-HAP)	0.6%	0.03	3.52	2,315	0.01	1,500	1.5%	62.87	138.60
n-Hexane	0.00%	0.00	0.00	4,404	0.00	50	0.0%	---	---
Benzene	0.00%	0.00	0.00	3,591	0.00	50	0.0%	---	---
Toluene	0.00%	0.00	0.00	4,274	0.00	50	0.0%	---	---
Ethylbenzene	0.00%	0.00	0.00	4,970	0.00	50	0.0%	---	---
Xylenes	0.00%	0.00	0.00	4,958	0.00	50	0.0%	---	---
Total HAP	0.0%	0.00	0.00	0	0.00	250	0.0%	68.02	149.96
TOTAL	99.4%	5.00	570.78	1,012	0.58	56,525	99.5%	54.74	120.68

4 - The Total Waste Gas to Flare at 5.00 MMscf/yr is a conservative estimate based on review of historical records. The Actual Waste Gas to Flare is anticipated to be less than 3.00 MMscf/yr.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)
New Process Flare (FL-02 (18E))

Unit ID (Point ID)	Description	Reference	Pollutant	Emission Factor		Pre-Controlled Emissions		Control Efficiency	Controlled Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy	%	lb/hr	tpy
FL-02 (18E)	Zeeco AFTA-20/56 New Process Flare (Waste Gas and Combustion)	EPA AP-42 Table 13.5-1	NOX	86.51	0.07	---	---	---	36.85	2.56
		EPA AP-42 Table 13.5-1	CO	470.73	0.37	---	---	---	200.51	13.94
	98% Control Efficiency	Mass Balance	THC	63,000	---	26,834.87	1,865.01	98.0%	536.70	37.30
		Mass Balance	NMHC	28,000	---	11,926.61	828.90	98.0%	238.53	16.58
		Mass Balance	NMNEHC	15,000	---	6,389.25	444.05	98.0%	127.79	8.88
		Mass Balance	VOC	15,000	---	6,389.25	444.05	98.0%	127.79	8.88
		541.91 MMBtu/hr (HHV) (max)	EPA AP-42 Table 1.4-2	SO2	0.75	5.88E-04	---	---	---	0.32
	7.74 MMBtu/hr (LHV) (avg)	EPA AP-42 Table 1.4-2	PM10/2.5	9.48	7.45E-03	---	---	---	4.04	0.28
	8.60 MMBtu/hr (HHV) (avg)	Mass Balance	Benzene	500	---	212.98	14.80	98.0%	4.26	0.30
		Mass Balance	Ethylbenzene	500	---	212.98	14.80	98.0%	4.26	0.30
	8,760 hr/yr	Mass Balance	HCHO	---	---	---	---	---	---	---
		Mass Balance	n-Hexane	500	---	212.98	14.80	98.0%	4.26	0.30
	59.21 MMscf/yr	Mass Balance	Toluene	500	---	212.98	14.80	98.0%	4.26	0.30
		Mass Balance	2,2,4-TMP	---	---	---	---	---	---	---
	6,754 scf/hr (avg)	Mass Balance	Xylenes	500	---	212.98	14.80	98.0%	4.26	0.30
		Mass Balance	Other HAP	---	---	---	---	---	---	---
	162.10 Mscfd (avg)	Mass Balance	Total HAP	2,500	---	1,064.88	74.01	98.0%	21.30	1.48
		40CFR98 - Table C-1	CO2	156,638	123.12	---	---	---	66,720	4,637
	1,146 Btu/scf (LHV) - avg	Mass Balance	CH4	35,000	---	14,908.26	1,036.12	98.0%	298.17	20.72
		40CFR98 - Table C-2	N2O	0.28	2.2E-04	---	---	---	1.9E-03	8.3E-03
1,272 Btu/scf (HHV) - avg	40CFR98 - Table A-1	CO2e	1,031,722	---	372,707	25,903	80.1%	74,175	5,158	

- Notes:
- 1 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.
 - 2 - Flare design capacity and short-term (lb/hr) emissions are based on flare vendor Case 4 (TXP2 plant maintenance) - flow rate of 22,000 lb/hr, MW = 19.6 lb/lb-mol and heating value = 1,080 Btu/scf (LHV).
 - 3 - Heat Input and CO2 emission factors determined as follows:

Component	Waste Gas (to Flare)						GHG (40CFR98)		
	Mol% (Vol%)	MMscf/yr	scf/hr	Btu/scf (LHV)	MMBtu/hr	lb/MMscf	Wgt%	kg/MMBtu	lb/MMBtu
Nitrogen	0.4%	0.25	28.21	0	---	---	0.6%	---	---
Carbon Dioxide	0.2%	0.11	12.61	0	---	---	0.4%	---	---
Methane	75.2%	44.53	5,083.59	909	4.62	35,000	57.6%	53.06	116.98
Ethane	16.8%	9.92	1,132.32	1,619	1.83	13,000	24.0%	59.60	131.40
VOC (Non-HAP)	7.3%	4.33	494.48	2,568	1.27	12,500	17.2%	62.87	138.60
n-Hexane	0.04%	0.03	2.95	4,404	0.01	500	0.2%	---	---
Benzene	0.00%	0.00	0.05	3,591	0.00	500	0.0%	---	---
Toluene	0.00%	0.00	0.07	4,274	0.00	500	0.0%	---	---
Ethylbenzene	0.00%	0.00	0.00	4,970	0.00	500	0.0%	---	---
Xylenes	0.00%	0.00	0.00	4,958	0.00	500	0.0%	---	---
Total HAP	0.0%	0.03	3.07	4,389	0.01	2,500	0.2%	68.02	149.96
TOTAL	99.9%	59.21	6,754.28	1,146	7.74	63,000	100.0%	55.85	123.12

4 - The Total Waste Gas to Flare at 59.21 MMscf/yr is a conservative estimate based on an annual blowdown of equipment. The Actual Waste Gas to Flare is anticipated to be less than 12.00 MMscf/yr.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Truck Load-Out (TLO (20E))

Unit ID	Description	S	P	M	T	CE	L _L	T-Put	VOC	BTEX, n-hexane (Ea)	Total HAP
		sat. fac.	psia	lb/lb-mol	°R	%	lb/Mgal	Mgal/yr	AP-42 Sect 5.2 tpy	5.00% of VOC tpy	25.00% of VOC tpy
TLO (20E)	Truck Load-Out - Prod H2O/Oil	1.45	0.24	18.28	510	0.0%	0.16	25,200	1.96	0.10	0.49
TOTAL TLO:									1.96	0.10	0.49

Notes: 1 - Emission factors and formulas are from AP-42 Section 5.2 "Transportation and Marketing of Petroleum Liquids":

$$L_L = 12.46 \times S \times P \times M / T \times (1 - CE)$$

where:

- L_L = Loading loss, lb/1,000 gal of liquid loaded.
- S = Saturation factor, used 1.45 for "splash loading".
- P = True vapor pressure of liquid loaded, psia. The vapor pressure is taken from EPA TANKS 4.0.9d.
- M = Molecular weight of vapors, lb/lb-mole. Used 18.28 lb/lb-mol from EPA TANKS 4.0.9d output.
- T = Temperature of bulk liquid loaded, °R = °F + 460. (Conservatively assumed 50 °F.)
- CE = Overall emission reduction efficiency (collection efficiency x control efficiency).

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Produced H2O Storage Tank Emissions (T-03 (22E) and T-04 (23E))

Unit ID	Material Stored	Capacity		Turnovers per Year	Throughput		Emission Factor	VOC		n Hex, BTEX (Ea) 5.00% of VOC **		Total HAP 25.00% of VOC **	
		gal	bbbl		gal/yr	bbbl/yr		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
T-03	Prod. H2O/Oil (9913 Tank)	16,800	400	500.0	8,400,000	200,000	0.0101 lb/bbl	0.23	1.01	0.01	0.05	0.06	0.25
T-04	Prod. H2O/Oil (9914 Tank)	16,800	400	500.0	8,400,000	200,000	0.0101 lb/bbl	0.23	1.01	0.01	0.05	0.06	0.25
TOTAL VOLUME:		33,600	800	500.0	16,800,000	400,000	TOTAL EMISSIONS:	0.46	2.03	0.02	0.10	0.12	0.51

- Notes: 1 - The produced water tank emissions are based on EPA TANKS 4.0.9d (working and breathing losses) and a VMGSim model simulation (flashing losses).
 2 - There are other storage tanks at the site but they are not listed above as they have de-minimis emissions as defined in West Virginia Air quality regulation 45CSR13.

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Facility-Wide Process Piping Fugitive Emissions (FUG (21E))

Unit	Description	Component (Unit) Type (Gas/Vapor)	Unit Count	THC Factor lb/hr/Unit	LDAR Control Credit	THC Emissions lb/hr	VOC 26.52 Wgt%		n-Hex, BTEX (Ea) 0.71 Wgt%		Total HAP 1.24 Wgt%		CO2 0.88 Wgt%		CH4 75.00 Wgt%		CO2e GWP = 25	
							lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FUG (21E)	Process Piping Fugitives (Gas/Vapor)	Valves	3,676	0.00992	67%	12.03	3.19	13.98	0.09	0.37	0.15	0.65	0.11	0.47	9.03	39.53	226	989
		Pump Seals	0	0.00529	0%	0.00	0	0	0	0	0	0	0	0	0	0	0	0
		Other	202	0.01940	0%	3.92	1.04	4.55	0.03	0.12	0.05	0.21	0.03	0.15	2.94	12.87	74	322
		Connectors	4,394	0.00044	0%	1.94	0.51	2.25	0.01	0.06	0.02	0.11	0.02	0.08	1.45	6.36	36	159
		Flanges	3,000	0.00086	0%	2.58	0.68	3.00	0.02	0.08	0.03	0.14	0.02	0.10	1.93	8.47	48	212
		Open-ended lines	20	0.00441	0%	0.09	0.02	0.10	6.2E-04	2.7E-03	1.1E-03	4.8E-03	7.8E-04	3.4E-03	0.07	0.29	2	7

Unit	Description	Component (Unit) Type (Light Liquid)	Unit Count	THC Factor lb/hr/Unit	LDAR Control Credit	THC Emissions lb/hr	VOC 100.00 Wgt%		n-Hex, BTEX (Ea) 2.22 Wgt%		Total HAP 2.51 Wgt%		CO2 0.00 Wgt%		CH4 0.00 Wgt%		CO2e GWP = 25	
							lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FUG (21E)	Process Piping Fugitives (Light Liquid)	Valves	1,827	0.00551	61%	3.93	3.93	17.20	0.09	0.38	0.10	0.43	0	0	0	0	0	0
		Pump Seals	28	0.02866	45%	0.44	0.44	1.93	0.01	0.04	0.01	0.05	0	0	0	0	0	0
		Other	105	0.01653	0%	1.74	1.74	7.60	0.04	0.17	0.04	0.19	0	0	0	0	0	0
		Connectors	2,470	0.00046	0%	1.14	1.14	5.01	0.03	0.11	0.03	0.13	0	0	0	0	0	0
		Flanges	2,738	0.00024	0%	0.66	0.66	2.91	0.01	0.06	0.02	0.07	0	0	0	0	0	0
		Open-ended lines	10	0.00309	0%	0.03	0.03	0.14	6.8E-04	3.0E-03	7.8E-04	3.4E-03	0	0	0	0	0	0

TOTAL FUGITIVE EMISSIONS:	13.39	58.67	0.32	1.41	0.45	1.99	0.18	0.80	15.42	67.54	386	1,689
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- Notes: 1 - Assumed 8,760 hours per year of fugitive emissions.
 2 - Gas/Vapor emissions calculated using EPA Protocol for Equipment Leak Emission Estimates, 1995, EPA-453/R-95-017

- 6 - VOC = non-methane/non-ethane THC (C3+).
 7 - HAP = hazardous air pollutants as designated by EPA, primarily n-hexane/BTEX.
 8 - To be conservative, the following gas characteristics were assumed:

TABLE 2.4 O&G PROD (AVE)	Gas/Vapor		Light Liquid	
	kg/hr	lb/hr	kg/hr	lb/hr
Valves	0.00450	0.00992	0.00250	0.00551
Pump Seals	0.00240	0.00529	0.01300	0.02866
Others	0.00880	0.01940	0.00750	0.01653
Connectors	0.00020	0.00044	0.00021	0.00046
Flanges	0.00039	0.00086	0.00011	0.00024
Open-Ended Lines	0.00200	0.00441	0.00140	0.00309

Pollutant	Gas/Vapor	Light Liquid
	Estimated	Estimated
Carbon Dioxide	0.88 Wgt%	0.00 Wgt%
Methane	75.00 Wgt%	0.00 Wgt%
VOC (Propane)	26.52 Wgt%	100.00 Wgt%
n-Hexane	0.71 Wgt%	2.22 Wgt%
Benzene	0.13 Wgt%	0.07 Wgt%
Toluene	0.13 Wgt%	0.07 Wgt%
Ethylbenzene	0.15 Wgt%	0.07 Wgt%
Xylenes	0.15 Wgt%	0.07 Wgt%
Total HAP:	1.24 Wgt%	2.51 Wgt%

- 3 - Component counts from site-specific LDAR program.
 4 - "Other" components include compressor seals, relief valves, diaphragms, drains, meters, etc.
 5 - THC = total hydrocarbons, including methane (CH4) and ethane (C2H6).

Potentially Applicable
AP-42 and GHG EMISSION FACTORS
(Preferentially use test data or vendor data where available)

Pollutant		GAS-FIRED ENGINES			GAS-FIRED TURBINES		
		AP-42 Table 3.2-1; 3.2-2; 3.2-3 07/00			AP-42 Table 3.1-1; 3.1-2a; 3.1-3 04/00		
		2SLB lb/MMBtu	4SLB lb/MMBtu	4SRB lb/MMBtu	Uncontrolled lb/MMBtu	Water Injection lb/MMBtu	Lean Pre-Mix# lb/MMBtu
CRITERIA	NOX (≥ 90% Load)	3.17E+00	4.08E+00	2.21E+00	3.20E-01	1.30E-01	9.90E-02
	CO (≥ 90% Load)	3.86E-01	3.17E-01	3.72E+00	8.20E-02	3.00E-02	1.50E-02
	THC (TOC)	1.64E+00	1.47E+00	3.58E-01	1.10E-02	1.10E-02	1.10E-02
	NMHC (THC-CH4)	1.90E-01	2.20E-01	1.28E-01	2.40E-03	2.40E-03	2.40E-03
	NMNEHC (NMHC-C2H6)	1.19E-01	1.15E-01	5.76E-02	2.10E-03	2.10E-03	2.10E-03
	VOC	1.20E-01	1.18E-01	2.96E-02	2.10E-03	2.10E-03	2.10E-03
	SO2*** (2,000 gr-S/MMscf)	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04
	PM10/2.5 (Filter+Cond)	4.83E-02	9.99E-03	1.94E-02	6.60E-03	6.60E-03	6.60E-03
HAPs	Benzene	1.94E-03	4.40E-04	1.58E-03	1.20E-05	1.20E-05	9.10E-07
	Ethylbenzene	1.08E-04	3.97E-05	2.48E-05	3.20E-05	3.20E-05	3.20E-05
	Formaldehyde (HCHO)	5.52E-02	5.28E-02	2.05E-02	7.10E-04	7.10E-04	2.00E-05
	n-Hexane	4.45E-04	1.11E-03	---	---	---	---
	Toluene	9.63E-04	4.08E-04	5.58E-04	1.30E-04	1.30E-04	1.30E-04
	2,2,4-Trimethylpentane	8.46E-04	2.50E-04	---	---	---	---
	Xylenes	2.68E-04	1.84E-04	1.95E-04	6.40E-05	6.40E-05	6.40E-05
	Other HAPs	1.96E-02	1.69E-02	9.42E-03	1.06E-04	1.06E-04	1.06E-04
GHG	CO2**** (GWP=1)	1.10E+02	1.10E+02	1.10E+02	1.10E+02	1.10E+02	1.10E+02
	CH4 (GWP=25)	1.45E+00	1.25E+00	2.30E-01	8.60E-03	8.60E-03	8.60E-03
	N2O (GWP=298)	2.20E-04	2.20E-04	2.20E-04	3.00E-03	3.00E-03	3.00E-03
	CO2e	1.46E+02	1.41E+02	1.16E+02	1.11E+02	1.11E+02	1.11E+02

(#Lean Pre-Mix - aka: Dry Low Emissions (DLE or DLN) and SoLoNOx)

Pollutant		GAS-FIRED EXTERNAL COMBUSTION			FLARES	DIESEL ENGINES
		AP-42 Table 1.4-1; 1.4-2; 1.4-3 (<100 MMBtu/hr) 07/98			13.5-1 01/95	3.3-1; 3.3-2 10/96
		Uncontrolled lb/MMBtu	LoNOx Burners lb/MMBtu	Flue Gas Recirc lb/MMBtu	(Combustion) lb/MMBtu	Uncontrolled lb/MMBtu
CRITERIA	NOX	9.80E-02	4.90E-02	3.14E-02	6.80E-02	4.41E+00
	CO	8.24E-02	8.24E-02	8.24E-02	3.70E-01	9.50E-01
	THC (TOC)	1.08E-02	1.08E-02	1.08E-02	1.40E-01	3.60E-01
	NMHC (THC-CH4)	8.53E-03	8.53E-03	8.53E-03	1.38E-01	3.53E-01
	NMNEHC (NMHC-C2H6)	5.49E-03	5.49E-03	5.49E-03	5.49E-03	3.50E-01
	VOC	5.39E-03	5.39E-03	5.39E-03	5.39E-03	3.60E-01
	SO2 (2,000 gr-S/MMscf)	5.88E-04	5.88E-04	5.88E-04	5.88E-04	2.90E-01
	PM10/2.5 (Filter+Condense)	7.45E-03	7.45E-03	7.45E-03	7.45E-03	3.10E-01
HAPs	Benzene	2.06E-06	2.06E-06	2.06E-06	2.06E-06	9.33E-04
	Ethylbenzene	---	---	---	---	---
	HCHO (Formaldehyde)	7.35E-05	7.35E-05	7.35E-05	7.35E-05	1.18E-03
	n-Hexane	1.76E-03	1.76E-03	1.76E-03	1.76E-03	---
	Toluene	3.33E-06	3.33E-06	3.33E-06	3.33E-06	4.09E-04
	2,2,4-Trimethylpentane	---	---	---	---	---
	Xylenes	---	---	---	---	2.85E-04
	Other HAPs	1.86E-06	1.86E-06	1.86E-06	1.86E-06	1.05E-03
GHG	CO2 (GWP=1)	1.18E+02	1.18E+02	1.18E+02	1.18E+02	1.64E+02
	CH4 (GWP=25)	2.25E-03	2.25E-03	2.25E-03	2.25E-03	6.61E-03
	N2O (GWP=298)	2.16E-03	6.27E-04	6.27E-04	2.16E-03	1.32E-03
	CO2e	1.18E+02	1.18E+02	1.18E+02	1.18E+02	1.65E+02

40 CFR 98 - DEFAULT EMISSION FACTORS				
Fuel Type	Table C-1 to Subpart C of Part 98		Table C-2 to Subpart C of Part 98	
	Default HHV	Carbon Dioxide lb CO2/MMBtu	Methane lb CH4/MMBtu	Nitrous Oxide lb N2O/MMBtu
Fuel Oil No. 2 (Diesel)	0.138 MMBtu/gal	1.61E+02	6.61E-03	1.32E-03
Natural Gas	1,028 MMBtu/scf	1.17E+02	2.20E-03	2.20E-04

Conversion Factors
<http://www.onlineconversion.com/>

1.0 lb = 453.5924 g
1.0 kg = 2.2046 lb
1.0 hp = 2,544.4332 Btu/hr
1.0 hp = 745.6999 Watt
1.0 kW = 3,412.1416 Btu/hr
1.0 kW-hr = 1,340 hp-hr
1.0 cf = 7.4805 gal
1.0 gal H2O = 8.3378 lb
1.0 cf H2O = 62.3711 lb
1.0 m = 3.2808 ft
1.0 km = 0.6214 mi
1.0 acre = 43,560.1742 ft2
1.0 °F = (°C*9/5)+32
1.0 °R = °F+459.67
1.0 % = 10,000 ppm
1 % = 10,000 ppm
UGC (stp) = 379.5 scf/lb-mol

Global Warming Potential (100 Yr) (GWP)		
Table A-1 to Subpart A of Part 98		
CO2	CH4*	N2O#
1	25	298

#Revised by EPA on 11/29/13

*Converted Ext Comb Emission Factors to lb/MMBtu by dividing lb/MMscf by the AP-42 default high heating value (HHV) of 1,020

**Converted GHG Emission Factors to lb/MMBtu by multiplying kg/MMBtu by 2.2046 lb/kg.

***Assumes 100% conversion of fuel sulfur to SO2 (2,000 gr/MMscf).

****Assumes 99.5% conversion of fuel carbon to CO2 for natural gas.

Rev 08/22/14 - Moved 2,2,4-TMP (i-octane) from hidden rows.

Rev 12/30/13 - Revised Flare Emission Factors. Revised GWP Emission Factors. Rewrote the *Notes.

Rev 10/31/13 - Recalculated THC, NMHC, NMNEHC and VOC. Added "Other Pollutants" (Hidden Rows). Misc edits.

Rev 09/27/13 - Added NMHC and NMNEHC. Show only 6 primary HAPs. Converted units for Ext Comb and GHG to lb/MMBTU.

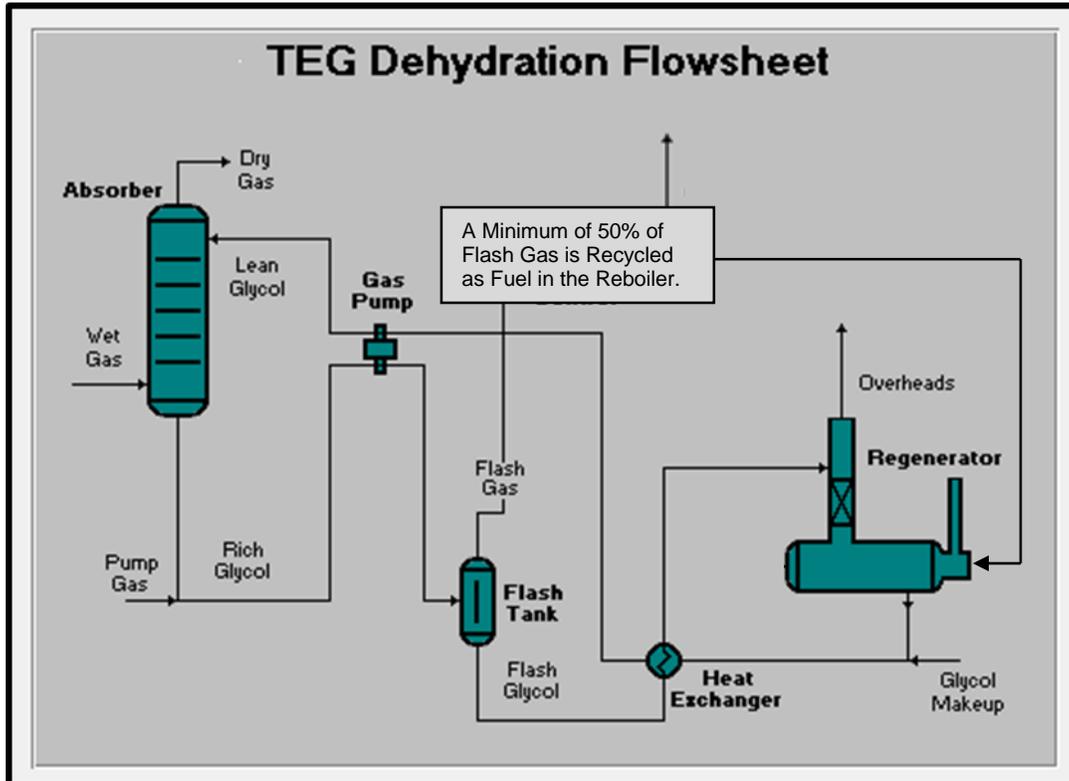
SUPPLEMENT 04

Modeling Results

§45-30-4.3.c.8 - The application forms shall include calculations or test data on which the information is based.

5.0 MMscfd Triethylene Glycol (TEG) Dehydrator (DH-01 (15E))

- GRI-GLYCalc 4.0 – Emission Summary
- GRI-GLYCalc 4.0 – Summary of Input Values
- GRI-GLYCalc 4.0 – Aggregate Calculations Report



GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Groves TEG Dehydrator (Fort Beeler)
 File Name: C:\projects2\wfs\OVM\Fort Beeler\Groves Dehy (Fort Beeler).ddf
 Date: May 07, 2014

DESCRIPTION:

Description: 5 MMscfd TEG Dehydrator. Extended inlet gas
 analysis for Groves Master dated 07-02-13.
 Inlet gas temp = 72F, pressure=836 psig.
 Kimray 4020 PV glycol pump.

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 72.00 deg. F
 Pressure: 836.00 psig
 Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.1322
Nitrogen	0.3474
Methane	81.0242
Ethane	12.9568
Propane	3.5869
Isobutane	0.4831
n-Butane	0.7906
Isopentane	0.2243
n-Pentane	0.1722
n-Hexane	0.0535
Cyclohexane	0.0136
Other Hexanes	0.1051
Heptanes	0.0629
Methylcyclohexane	0.0112
Benzene	0.0012
Toluene	0.0030
Xylenes	0.0047
C8+ Heavies	0.0271

DRY GAS:

Flow Rate: 5.0 MMSCF/day
 Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
 Water Content: 1.5 wt% H2O
 Flow Rate: 0.7 gpm

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

FLASH TANK:

Flash Control: Combustion device
Flash Control Efficiency: 50.00 %
Temperature: 150.0 deg. F
Pressure: 50.0 psig

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Groves TEG Dehydrator (Fort Beeler)

File Name: C:\projects2\wfs\OVM\Fort Beeler\Groves Dehy (Fort Beeler).ddf

Date: May 07, 2014

DESCRIPTION:

Description: 5 MMscfd TEG Dehydrator. Extended inlet gas analysis for Groves Master dated 07-02-13.
 Inlet gas temp = 72F, pressure=836 psig.
 Kimray 4020 PV glycol pump.

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0683	1.639	0.2992
Ethane	0.0827	1.985	0.3623
Propane	0.0782	1.878	0.3427
Isobutane	0.0227	0.545	0.0994
n-Butane	0.0540	1.297	0.2367
Isopentane	0.0206	0.494	0.0902
n-Pentane	0.0222	0.534	0.0974
n-Hexane	0.0183	0.439	0.0800
Cyclohexane	0.0416	0.998	0.1822
Other Hexanes	0.0236	0.566	0.1032
Heptanes	0.0668	1.604	0.2928
Methylcyclohexane	0.0478	1.148	0.2094
Benzene	0.0551	1.322	0.2412
Toluene	0.2408	5.780	1.0548
Xylenes	0.7943	19.064	3.4792
C8+ Heavies	0.1718	4.123	0.7524
Total Emissions	1.8089	43.414	7.9231
Total Hydrocarbon Emissions	1.8089	43.414	7.9231
Total VOC Emissions	1.6579	39.790	7.2616
Total HAP Emissions	1.1085	26.604	4.8552
Total BTEX Emissions	1.0902	26.165	4.7752

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	4.2117	101.082	18.4474
Ethane	1.5360	36.864	6.7278
Propane	0.7116	17.078	3.1168
Isobutane	0.1427	3.425	0.6250
n-Butane	0.2655	6.371	1.1627
Isopentane	0.0925	2.220	0.4052
n-Pentane	0.0813	1.951	0.3560
n-Hexane	0.0385	0.924	0.1687
Cyclohexane	0.0222	0.533	0.0973
Other Hexanes	0.0653	1.567	0.2861

Heptanes	0.0717	1.721	0.3141
Methylcyclohexane	0.0206	0.495	0.0903
Benzene	0.0046	0.110	0.0201
Toluene	0.0135	0.324	0.0591
Xylenes	0.0190	0.455	0.0830
C8+ Heavies	0.0270	0.648	0.1183

Total Emissions	7.3237	175.769	32.0779
Total Hydrocarbon Emissions	7.3237	175.769	32.0779
Total VOC Emissions	1.5760	37.823	6.9027
Total HAP Emissions	0.0756	1.814	0.3310
Total BTEX Emissions	0.0371	0.889	0.1623

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	8.4235	202.163	36.8948
Ethane	3.0720	73.729	13.4555
Propane	1.4232	34.156	6.2335
Isobutane	0.2854	6.850	1.2501
n-Butane	0.5309	12.742	2.3254
Isopentane	0.1850	4.440	0.8104
n-Pentane	0.1626	3.902	0.7120
n-Hexane	0.0770	1.849	0.3374
Cyclohexane	0.0444	1.066	0.1946
Other Hexanes	0.1306	3.135	0.5721
Heptanes	0.1434	3.443	0.6283
Methylcyclohexane	0.0412	0.989	0.1806
Benzene	0.0092	0.221	0.0403
Toluene	0.0270	0.648	0.1182
Xylenes	0.0379	0.910	0.1661
C8+ Heavies	0.0540	1.296	0.2365

Total Emissions	14.6474	351.539	64.1558
Total Hydrocarbon Emissions	14.6474	351.539	64.1558
Total VOC Emissions	3.1519	75.646	13.8054
Total HAP Emissions	0.1511	3.627	0.6619
Total BTEX Emissions	0.0741	1.779	0.3246

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	4.2800	102.721	18.7466
Ethane	1.6187	38.850	7.0901
Propane	0.7898	18.956	3.4594
Isobutane	0.1654	3.970	0.7244
n-Butane	0.3195	7.668	1.3994
Isopentane	0.1131	2.714	0.4954
n-Pentane	0.1035	2.485	0.4534
n-Hexane	0.0568	1.363	0.2487
Cyclohexane	0.0638	1.531	0.2794
Other Hexanes	0.0889	2.133	0.3893
Heptanes	0.1386	3.326	0.6069
Methylcyclohexane	0.0684	1.642	0.2997
Benzene	0.0597	1.432	0.2614

Toluene	0.2543	6.103	1.1139
Xylenes	0.8133	19.519	3.5622
C8+ Heavies	0.1988	4.771	0.8707

Total Emissions	9.1326	219.183	40.0010
Total Hydrocarbon Emissions	9.1326	219.183	40.0010
Total VOC Emissions	3.2339	77.613	14.1643
Total HAP Emissions	1.1841	28.417	5.1862
Total BTEX Emissions	1.1273	27.055	4.9375

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction

Methane	37.1940	18.7466	49.60
Ethane	13.8178	7.0901	48.69
Propane	6.5762	3.4594	47.39
Isobutane	1.3495	0.7244	46.32
n-Butane	2.5620	1.3994	45.38
Isopentane	0.9006	0.4954	44.99
n-Pentane	0.8094	0.4534	43.98
n-Hexane	0.4174	0.2487	40.41
Cyclohexane	0.3767	0.2794	25.82
Other Hexanes	0.6754	0.3893	42.36
Heptanes	0.9211	0.6069	34.11
Methylcyclohexane	0.3900	0.2997	23.15
Benzene	0.2815	0.2614	7.15
Toluene	1.1730	1.1139	5.04
Xylenes	3.6453	3.5622	2.28
C8+ Heavies	0.9890	0.8707	11.96

Total Emissions	72.0788	40.0010	44.50
Total Hydrocarbon Emissions	72.0788	40.0010	44.50
Total VOC Emissions	21.0670	14.1643	32.77
Total HAP Emissions	5.5172	5.1862	6.00
Total BTEX Emissions	5.0997	4.9375	3.18

EQUIPMENT REPORTS:

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages: 1.25
 Calculated Dry Gas Dew Point: 1.24 lbs. H₂O/MMSCF

Temperature: 72.0 deg. F
 Pressure: 836.0 psig
 Dry Gas Flow Rate: 5.0000 MMSCF/day

Glycol Losses with Dry Gas: 0.0226 lb/hr
 Wet Gas Water Content: Saturated
 Calculated Wet Gas Water Content: 28.38 lbs. H2O/MMSCF
 Calculated Lean Glycol Recirc. Ratio: 7.10 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	4.36%	95.64%
Carbon Dioxide	99.80%	0.20%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.96%	0.04%
Propane	99.93%	0.07%
Isobutane	99.91%	0.09%
n-Butane	99.87%	0.13%
Isopentane	99.87%	0.13%
n-Pentane	99.84%	0.16%
n-Hexane	99.73%	0.27%
Cyclohexane	98.74%	1.26%
Other Hexanes	99.80%	0.20%
Heptanes	99.50%	0.50%
Methylcyclohexane	98.63%	1.37%
Benzene	87.62%	12.38%
Toluene	82.46%	17.54%
Xylenes	69.73%	30.27%
C8+ Heavies	99.22%	0.78%

FLASH TANK

Flash Control: Combustion device
 Flash Control Efficiency: 50.00 %
 Flash Temperature: 150.0 deg. F
 Flash Pressure: 50.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.54%	0.46%
Carbon Dioxide	7.56%	92.44%
Nitrogen	0.79%	99.21%
Methane	0.80%	99.20%
Ethane	2.62%	97.38%
Propane	5.21%	94.79%
Isobutane	7.37%	92.63%
n-Butane	9.24%	90.76%
Isopentane	10.26%	89.74%
n-Pentane	12.30%	87.70%
n-Hexane	19.47%	80.53%
Cyclohexane	49.88%	50.12%
Other Hexanes	15.85%	84.15%
Heptanes	32.07%	67.93%
Methylcyclohexane	55.42%	44.58%
Benzene	86.41%	13.59%
Toluene	90.71%	9.29%
Xylenes	96.03%	3.97%
C8+ Heavies	78.65%	21.35%

REGENERATOR

 No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	50.18%	49.82%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	2.64%	97.36%
n-Pentane	2.48%	97.52%
n-Hexane	1.85%	98.15%
Cyclohexane	5.93%	94.07%
Other Hexanes	4.16%	95.84%
Heptanes	1.29%	98.71%
Methylcyclohexane	6.72%	93.28%
Benzene	5.74%	94.26%
Toluene	8.66%	91.34%
Xylenes	13.41%	86.59%
C8+ Heavies	13.66%	86.34%

 STREAM REPORTS:

 WET GAS STREAM

Temperature: 72.00 deg. F
 Pressure: 850.70 psia
 Flow Rate: 2.09e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	5.98e-002	5.92e+000
Carbon Dioxide	1.32e-001	3.20e+001
Nitrogen	3.47e-001	5.34e+001
Methane	8.10e+001	7.14e+003
Ethane	1.29e+001	2.14e+003
Propane	3.58e+000	8.69e+002
Isobutane	4.83e-001	1.54e+002
n-Butane	7.90e-001	2.52e+002
Isopentane	2.24e-001	8.89e+001
n-Pentane	1.72e-001	6.82e+001
n-Hexane	5.35e-002	2.53e+001
Cyclohexane	1.36e-002	6.29e+000
Other Hexanes	1.05e-001	4.97e+001
Heptanes	6.29e-002	3.46e+001
Methylcyclohexane	1.12e-002	6.04e+000
Benzene	1.20e-003	5.15e-001
Toluene	3.00e-003	1.52e+000
Xylenes	4.70e-003	2.74e+000
C8+ Heavies	2.71e-002	2.54e+001

Total Components 100.00 1.10e+004

DRY GAS STREAM

 Temperature: 72.00 deg. F
 Pressure: 850.70 psia
 Flow Rate: 2.08e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
-----	-----	-----
Water	2.61e-003	2.58e-001
Carbon Dioxide	1.32e-001	3.19e+001
Nitrogen	3.47e-001	5.34e+001
Methane	8.10e+001	7.14e+003
Ethane	1.30e+001	2.14e+003
Propane	3.59e+000	8.68e+002
Isobutane	4.83e-001	1.54e+002
n-Butane	7.90e-001	2.52e+002
Isopentane	2.24e-001	8.88e+001
n-Pentane	1.72e-001	6.81e+001
n-Hexane	5.34e-002	2.53e+001
Cyclohexane	1.34e-002	6.21e+000
Other Hexanes	1.05e-001	4.96e+001
Heptanes	6.26e-002	3.44e+001
Methylcyclohexane	1.10e-002	5.96e+000
Benzene	1.05e-003	4.51e-001
Toluene	2.47e-003	1.25e+000
Xylenes	3.28e-003	1.91e+000
C8+ Heavies	2.69e-002	2.52e+001
-----	-----	-----
Total Components	100.00	1.09e+004

LEAN GLYCOL STREAM

 Temperature: 72.00 deg. F
 Flow Rate: 6.70e-001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
-----	-----	-----
TEG	9.85e+001	3.71e+002
Water	1.50e+000	5.66e+000
Carbon Dioxide	1.73e-012	6.51e-012
Nitrogen	2.11e-013	7.96e-013
Methane	8.18e-018	3.08e-017
Ethane	1.11e-007	4.17e-007
Propane	6.26e-009	2.36e-008
Isobutane	1.15e-009	4.33e-009
n-Butane	2.09e-009	7.86e-009
Isopentane	1.48e-004	5.59e-004
n-Pentane	1.50e-004	5.65e-004
n-Hexane	9.12e-005	3.44e-004
Cyclohexane	6.96e-004	2.62e-003
Other Hexanes	2.72e-004	1.02e-003
Heptanes	2.31e-004	8.72e-004
Methylcyclohexane	9.13e-004	3.44e-003
Benzene	8.90e-004	3.35e-003
Toluene	6.06e-003	2.28e-002
Xylenes	3.26e-002	1.23e-001

C8+ Heavies	7.21e-003	2.72e-002

Total Components	100.00	3.77e+002

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 72.00 deg. F
 Pressure: 850.70 psia
 Flow Rate: 7.18e-001 gpm
 NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)

TEG	9.30e+001	3.71e+002
Water	2.84e+000	1.13e+001
Carbon Dioxide	2.48e-002	9.90e-002
Nitrogen	1.62e-002	6.47e-002
Methane	2.13e+000	8.49e+000
Ethane	7.90e-001	3.15e+000
Propane	3.76e-001	1.50e+000
Isobutane	7.72e-002	3.08e-001
n-Butane	1.47e-001	5.85e-001
Isopentane	5.16e-002	2.06e-001
n-Pentane	4.64e-002	1.85e-001
n-Hexane	2.40e-002	9.56e-002
Cyclohexane	2.22e-002	8.86e-002
Other Hexanes	3.89e-002	1.55e-001
Heptanes	5.29e-002	2.11e-001
Methylcyclohexane	2.32e-002	9.25e-002
Benzene	1.69e-002	6.76e-002
Toluene	7.28e-002	2.91e-001
Xylenes	2.39e-001	9.55e-001
C8+ Heavies	6.34e-002	2.53e-001

Total Components	100.00	3.99e+002

FLASH TANK OFF GAS STREAM

Temperature: 150.00 deg. F
 Pressure: 64.70 psia
 Flow Rate: 2.62e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)

Water	4.18e-001	5.21e-002
Carbon Dioxide	3.01e-001	9.15e-002
Nitrogen	3.31e-001	6.42e-002
Methane	7.59e+001	8.42e+000
Ethane	1.48e+001	3.07e+000
Propane	4.67e+000	1.42e+000
Isobutane	7.10e-001	2.85e-001
n-Butane	1.32e+000	5.31e-001
Isopentane	3.71e-001	1.85e-001
n-Pentane	3.26e-001	1.63e-001
n-Hexane	1.29e-001	7.70e-002
Cyclohexane	7.63e-002	4.44e-002
Other Hexanes	2.19e-001	1.31e-001
Heptanes	2.07e-001	1.43e-001
Methylcyclohexane	6.07e-002	4.12e-002

Benzene	1.70e-002	9.19e-003
Toluene	4.24e-002	2.70e-002
Xylenes	5.16e-002	3.79e-002
C8+ Heavies	4.58e-002	5.40e-002

Total Components	100.00	1.49e+001

FLASH TANK GLYCOL STREAM

Temperature: 150.00 deg. F
Flow Rate: 6.85e-001 gpm

Component	Conc. (wt%)	Loading (lb/hr)

TEG	9.65e+001	3.71e+002
Water	2.93e+000	1.13e+001
Carbon Dioxide	1.95e-003	7.49e-003
Nitrogen	1.32e-004	5.08e-004
Methane	1.78e-002	6.83e-002
Ethane	2.15e-002	8.27e-002
Propane	2.04e-002	7.82e-002
Isobutane	5.90e-003	2.27e-002
n-Butane	1.41e-002	5.40e-002
Isopentane	5.50e-003	2.12e-002
n-Pentane	5.93e-003	2.28e-002
n-Hexane	4.84e-003	1.86e-002
Cyclohexane	1.15e-002	4.42e-002
Other Hexanes	6.40e-003	2.46e-002
Heptanes	1.76e-002	6.77e-002
Methylcyclohexane	1.33e-002	5.13e-002
Benzene	1.52e-002	5.84e-002
Toluene	6.86e-002	2.64e-001
Xylenes	2.39e-001	9.17e-001
C8+ Heavies	5.18e-002	1.99e-001

Total Components	100.00	3.84e+002

FLASH GAS EMISSIONS

Flow Rate: 6.21e+002 scfh
Control Method: Combustion Device
Control Efficiency: 50.00

Component	Conc. (vol%)	Loading (lb/hr)

Water	4.99e+001	1.47e+001
Carbon Dioxide	2.91e+001	2.09e+001
Nitrogen	1.40e-001	6.42e-002
Methane	1.60e+001	4.21e+000
Ethane	3.12e+000	1.54e+000
Propane	9.86e-001	7.12e-001
Isobutane	1.50e-001	1.43e-001
n-Butane	2.79e-001	2.65e-001
Isopentane	7.84e-002	9.25e-002
n-Pentane	6.89e-002	8.13e-002
n-Hexane	2.73e-002	3.85e-002
Cyclohexane	1.61e-002	2.22e-002
Other Hexanes	4.63e-002	6.53e-002

Heptanes	4.37e-002	7.17e-002
Methylcyclohexane	1.28e-002	2.06e-002
Benzene	3.60e-003	4.60e-003
Toluene	8.95e-003	1.35e-002
Xylenes	1.09e-002	1.90e-002
C8+ Heavies	9.69e-003	2.70e-002

Total Components	100.00	4.30e+001

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
 Pressure: 14.70 psia
 Flow Rate: 1.28e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)

Water	9.26e+001	5.61e+000
Carbon Dioxide	5.06e-002	7.49e-003
Nitrogen	5.39e-003	5.08e-004
Methane	1.27e+000	6.83e-002
Ethane	8.17e-001	8.27e-002
Propane	5.27e-001	7.82e-002
Isobutane	1.16e-001	2.27e-002
n-Butane	2.76e-001	5.40e-002
Isopentane	8.48e-002	2.06e-002
n-Pentane	9.16e-002	2.22e-002
n-Hexane	6.30e-002	1.83e-002
Cyclohexane	1.47e-001	4.16e-002
Other Hexanes	8.13e-002	2.36e-002
Heptanes	1.98e-001	6.68e-002
Methylcyclohexane	1.45e-001	4.78e-002
Benzene	2.09e-001	5.51e-002
Toluene	7.77e-001	2.41e-001
Xylenes	2.22e+000	7.94e-001
C8+ Heavies	3.00e-001	1.72e-001

Total Components	100.00	7.43e+000

SUPPLEMENT 05

Gas Analysis

§45-30-4.3.c.8 - The application forms shall include calculations or test data on which the information is based.

- **Inlet Gas Composition**
 - **Residue Gas Composition**
 - **Natural Gas Liquids (NGL) Composition**
 - **Dehydrator Gas Composition**
 - **Waste Gas Composition – Old Process Flare**
 - **Waste Gas Btu Analysis – Old Process Flare**
 - **Waste Gas Composition – New Process Flare**
 - **Waste Gas Btu Analysis – New Process Flare**
-

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Inlet Gas Composition

Representative Inlet Gas Composition (Fort Beeler 12 inch)

<http://www.chemindustry.com/apps/chemicals>

Compound	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fraction (M%/Sum-M%)	Weighted Sum (MW*MF)	Weight % (WS/Sum-WS)	lb/MMscf (WS/UGC#)
Nitrogen	7727-37-9	N2	28.013	0.4955	0.004955	0.1388	0.6466	365.79
Hydrogen Sulfide	2148-87-8	H2S	34.086	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	0.1887	0.001887	0.0830	0.3869	218.85
Methane*	75-82-8	CH4	16.042	73.4443	0.734465	11.7826	54.8860	31,049.24
Ethane*	74-84-0	C2H6	30.069	17.2512	0.172517	5.1874	24.1641	13,669.75
Propane**	74-98-6	C3H8	44.096	6.0946	0.060948	2.6875	12.5191	7,082.11
i-Butane**	75-28-5	C4H10	58.122	0.5849	0.005849	0.3400	1.5836	895.87
n-Butane**	106-97-8	C4H10	58.122	1.3036	0.013036	0.7577	3.5295	1,996.68
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	0.2148	0.002148	0.1550	0.7219	408.40
n-Pentane**	109-66-0	C5H12	72.149	0.2357	0.002357	0.1701	0.7922	448.14
Cyclohexane**	110-82-7	C6H12	84.159	0.0112	0.000112	0.0094	0.0439	24.84
Other Hexanes**	varies	C6H14	86.175	0.0750	0.000750	0.0646	0.3011	170.32
Methylcyclohexane**	varies	C7H14	98.186	0.0062	0.000062	0.0061	0.0284	16.04
Heptanes**	varies	C7H16	100.202	0.0287	0.000287	0.0288	0.1340	75.78
C8+ Heavies**	varies	C8+	114.229	0.0087	0.000087	0.0099	0.0463	26.19
n-Hexane***	110-54-3	C6H14	86.175	0.0518	0.000518	0.0446	0.2079	117.63
Benzene***	71-43-2	C6H6	78.112	0.0008	0.000008	0.0006	0.0029	1.65
Toluene***	108-88-3	C7H8	92.138	0.0013	0.000013	0.0012	0.0056	3.16
Ethylbenzene***	100-41-4	C8H10	106.165	0.0000	0.000000	0.0000	0.0000	0.00
Xylenes***	1330-20-7	C8H10	106.165	0.0000	0.000000	0.0000	0.0000	0.00
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	---	---	---	---	---

Totals:	100.00	1.0000	21.4675	100.00	56,570.43
THC:	99.31	0.9932	21.2456	98.97	55,985.80
Total VOC:	8.62	0.0862	4.2756	19.92	11,266.81
Total HAP:	0.05	0.0005	0.0465	0.22	122.44

* = Hydrocarbon (HC) ** = also Volatile Organic Compound (EPA-VOC) *** = also Hazardous Air Pollutant (EPA-HAP)

#UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 °F and 14.696 psia. Pound "X"/scf = M% of "X" * MW of "X" / UGC

To be conservative, the following "worst-case" values were assumed:

Compound	CAS	Formula	Representative Gas Analysis			Assumed "Worst-Case" Parameters		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	0.189	0.387	218.85	0.431	0.884	500.00
Methane	75-82-8	CH4	73.444	54.886	31,049.24	82.789	75.000	35,000.00
Ethane	74-84-0	CH5	17.251	24.164	13,669.75	17.668	25.000	14,000.00
VOC (Propane)	74-98-6	C3H8	8.617	19.916	11,266.81	11.473	26.516	15,000.00
n-Hexane	110-54-3	C6H14	0.0518	0.2079	117.63	0.1761	0.7071	400.00
Benzene	71-43-2	C6H6	0.0008	0.0029	1.65	0.0364	0.1326	75.00
Toluene	108-88-3	C7H8	0.0013	0.0056	3.16	0.0309	0.1326	75.00
Ethylbenzene	100-41-4	C8H10	0.0000	0.0000	0.00	0.0300	0.1500	75.00
Xylenes	1330-20-7	C8H10	0.0000	0.0000	0.00	0.0300	0.1500	75.00
Total HAP:	Various	C6 thru C8	0.0539	0.2164	122.44	0.3082	1.2374	700.00

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Residue Gas Composition

Representative Residue Gas Composition

<http://www.chemindustry.com/apps/chemicals>

Compound	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fraction (M%/Sum-M%)	Weighted Sum (MW*MF)	Weight % (WS/Sum-WS)	lb/MMscf (WS/UGC#)
Nitrogen	7727-37-9	N2	28.013	0.0000	---	---	---	---
Hydrogen Sulfide	2148-87-8	H2S	34.086	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	0.1754	0.001761	0.0775	0.4243	204.24
Methane*	75-82-8	CH4	16.042	84.6798	0.850248	13.6401	74.6771	35,943.91
Ethane*	74-84-0	C2H6	30.069	14.0913	0.141487	4.2544	23.2920	11,211.02
Propane**	74-98-6	C3H8	44.096	0.6174	0.006199	0.2734	1.4966	720.34
i-Butane**	75-28-5	C4H10	58.122	0.0100	0.000100	0.0058	0.0320	15.38
n-Butane**	106-97-8	C4H10	58.122	0.0112	0.000112	0.0065	0.0358	17.22
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	0.0007	0.000007	0.0005	0.0029	1.39
n-Pentane**	109-66-0	C5H12	72.149	0.0008	0.000008	0.0006	0.0031	1.49
Cyclohexane**	110-82-7	C6H12	84.159	---	---	---	---	---
Other Hexanes**	varies	C6H14	86.175	0.0076	0.000077	0.0066	0.0362	17.42
Methylcyclohexane**	varies	C7H14	98.186	---	---	---	---	---
Heptanes**	varies	C7H16	100.202	---	---	---	---	---
C8+ Heavies**	varies	C8+	114.229	---	---	---	---	---
n-Hexane***	110-54-3	C6H14	86.175	---	---	---	---	---
Benzene***	71-43-2	C6H6	78.112	---	---	---	---	---
Toluene***	108-88-3	C7H8	92.138	---	---	---	---	---
Ethylbenzene***	100-41-4	C8H10	106.165	---	---	---	---	---
Xylenes***	1330-20-7	C8H10	106.165	---	---	---	---	---
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	---	---	---	---	---

Totals:	99.59	1.0000	18.2654	100.00	48,132.42
THC:	99.42	0.9982	18.1879	99.58	47,928.18
Total VOC:	0.65	0.0065	0.2934	1.61	773.24
Total HAP:	0.00	0.0000	0.0000	0.00	0.00

* = Hydrocarbon (HC) ** = also Volatile Organic Compound (EPA-VOC) *** = also Hazardous Air Pollutant (EPA-HAP)

#UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 °F and 14.696 psia. Pound "X"/scf = M% of "X" * MW of "X" / UGC

To be conservative, the following "worst-case" values were assumed:

Compound	CAS	Formula	Representative Gas Analysis			Assumed "Worst-Case" Parameters		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	0.175	0.424	204.24	0.429	1.039	500.00
Methane	75-82-8	CH4	84.680	74.677	35,943.91	100.000	100.000	42,275.00
Ethane	74-84-0	C2H6	14.091	23.292	11,211.02	15.711	25.970	12,500.00
VOC (Propane)	74-98-6	C3H8	0.648	1.606	773.24	1.257	3.116	1,500.00
n-Hexane	110-54-3	C6H14	---	---	---	0.0250	0.1000	50.00
Benzene	71-43-2	C6H6	---	---	---	0.0250	0.1000	50.00
Toluene	108-88-3	C7H8	---	---	---	0.0250	0.1000	50.00
Ethylbenzene	100-41-4	C8H10	---	---	---	0.0250	0.1000	50.00
Xylenes	1330-20-7	C8H10	---	---	---	0.0250	0.1000	50.00
Total HAP:	Various	C6 thru C8	---	---	---	0.1250	0.5000	250.00

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

NGL Composition

Representative NGL Composition

<http://www.chemindustry.com/apps/chemicals>

Compound	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fraction (M%/Sum-M%)	Weighted Sum (MW*MF)	Weight % (WS/Sum-WS)	lb/MMscf (WS/UGC#)
Nitrogen	7727-37-9	N2	28.013	---	---	---	---	---
Hydrogen Sulfide	2148-87-8	H2S	34.086	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	---	---	---	---	---
Methane*	75-82-8	CH4	16.042	0.0000	---	---	---	---
Ethane*	74-84-0	C2H6	30.069	1.3372	0.013372	0.4021	0.7830	1,059.53
Propane**	74-98-6	C3H8	44.096	62.5289	0.625275	27.5719	53.6921	72,656.60
i-Butane**	75-28-5	C4H10	58.122	7.8072	0.078070	4.5376	8.8363	11,957.38
n-Butane**	106-97-8	C4H10	58.122	16.5929	0.165925	9.6439	18.7801	25,413.42
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	3.7435	0.037434	2.7008	5.2595	7,117.14
n-Pentane**	109-66-0	C5H12	72.149	3.9706	0.039705	2.8647	5.5785	7,548.91
Cyclohexane**	110-82-7	C6H12	84.159	0.2330	0.002330	0.1961	0.3819	516.72
Other Hexanes**	varies	C6H14	86.175	1.6520	0.016520	1.4236	2.7722	3,751.39
Methylcyclohexane**	varies	C7H14	98.186	0.1300	0.001300	0.1276	0.2486	336.35
Heptanes**	varies	C7H16	100.202	0.6460	0.006460	0.6473	1.2605	1,705.72
C8+ Heavies**	varies	C8+	114.229	0.1970	0.001970	0.2250	0.4382	592.98
n-Hexane***	110-54-3	C6H14	86.175	1.0850	0.010850	0.9350	1.8207	2,463.84
Benzene***	71-43-2	C6H6	78.112	0.0180	0.000180	0.0141	0.0274	37.05
Toluene***	108-88-3	C7H8	92.138	0.0250	0.000250	0.0230	0.0449	60.70
Ethylbenzene***	100-41-4	C8H10	106.165	0.0000	---	---	---	---
Xylenes***	1330-20-7	C8H10	106.165	0.0250	0.000250	0.0265	0.0517	69.94
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	0.0110	0.000110	0.0126	0.0245	33.11

Totals:	100.00	1.0000	51.3518	100.00	135,320.78
THC:	100.00	1.0000	51.3518	100.00	135,320.78
Total VOC:	98.67	0.9866	50.9497	99.22	134,261.25
Total HAP:	1.16	0.0116	1.0112	1.97	2,664.63

* = Hydrocarbon (HC) ** = also Volatile Organic Compound (EPA-VOC) *** = also Hazardous Air Pollutant (EPA-HAP)

#UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 °F and 14.696 psia. Pound "X"/scf = M% of "X" * MW of "X" / UGC

To be conservative, the following "worst-case" values were assumed:

Compound	CAS	Formula	Representative Gas Analysis			Assumed "Worst-Case" Parameters		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	---	---	---	0.000	0.000	0.00
Methane	75-82-8	CH4	0.000	---	---	0.000	0.000	0.00
Ethane	74-84-0	CH5	1.337	0.783	1,059.53	1.767	1.000	1,400.00
VOC (Propane)	74-98-6	C3H8	98.665	99.217	134,261.25	100.000	100.000	135,000.00
n-Hexane	110-54-3	C6H14	1.0850	1.8207	2,463.84	1.3211	2.2170	3,000.00
Benzene	71-43-2	C6H6	0.0180	0.0274	37.05	0.0486	0.0739	100.00
Toluene	108-88-3	C7H8	0.0250	0.0449	60.70	0.0412	0.0739	100.00
Ethylbenzene	100-41-4	C8H10	---	---	---	0.0400	0.0740	100.00
Xylenes	1330-20-7	C8H10	0.0250	0.0517	69.94	0.0357	0.0739	100.00
Total HAP:	Various	C6 thru C8	1.1640	1.9691	2,664.63	1.4866	2.5126	3,400.00

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Dehydrator Inlet Gas Composition

Representative Dehydrator Inlet Gas Composition (Groves Master - 07/02/13)

Compound	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fraction (M%/Sum-M%)	Weighted Sum (MW*MF)	Weight % (WS/Sum-WS)	lb/MMscf (WS/UGC#)
Nitrogen	7727-37-9	N2	28.013	0.3474	0.003474	0.0973	0.4886	256.46
Hydrogen Sulfide	2148-87-8	H2S	34.086	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	0.1322	0.001322	0.0582	0.2921	153.32
Methane*	75-82-8	CH4	16.042	81.0242	0.810263	12.9986	65.2635	34,253.57
Ethane*	74-84-0	C2H6	30.069	12.9568	0.129571	3.8961	19.5615	10,266.86
Propane**	74-98-6	C3H8	44.096	3.5869	0.035870	1.5817	7.9414	4,168.07
i-Butane**	75-28-5	C4H10	58.122	0.4831	0.004831	0.2808	1.4098	739.94
n-Butane**	106-97-8	C4H10	58.122	0.7906	0.007906	0.4595	2.3072	1,210.93
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	0.2243	0.002243	0.1618	0.8125	426.46
n-Pentane**	109-66-0	C5H12	72.149	0.1722	0.001722	0.1242	0.6238	327.40
Cyclohexane**	110-82-7	C6H12	84.159	0.0136	0.000136	0.0114	0.0575	30.16
Other Hexanes**	varies	C6H14	86.175	0.1051	0.001051	0.0906	0.4547	238.67
Methylcyclohexane**	varies	C7H14	98.186	0.0117	0.000117	0.0115	0.0577	30.27
Heptanes**	varies	C7H16	100.202	0.0624	0.000624	0.0625	0.3139	164.77
C8+ Heavies**	varies	C8+	114.229	0.0242	0.000242	0.0276	0.1388	72.85
n-Hexane***	110-54-3	C6H14	86.175	0.0535	0.000535	0.0461	0.2315	121.49
Benzene***	71-43-2	C6H6	78.112	0.0012	0.000012	0.0009	0.0047	2.47
Toluene***	108-88-3	C7H8	92.138	0.0030	0.000030	0.0028	0.0139	7.28
Ethylbenzene***	100-41-4	C8H10	106.165	0.0000	0.000000	0.0000	0.0000	0.00
Xylenes***	1330-20-7	C8H10	106.165	0.0047	0.000047	0.0050	0.0251	13.15
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	0.0003	0.000003	0.0003	0.0017	0.90

Totals:	100.00	1.0000	19.9171	100.00	52,485.04
THC:	99.52	0.9952	19.7616	99.22	52,075.26
Total VOC:	5.54	0.0554	2.8669	14.39	7,554.83
Total HAP:	0.06	0.0006	0.0551	0.28	145.30

* = Hydrocarbon (HC) ** = also Volatile Organic Compound (EPA-VOC) *** = also Hazardous Air Pollutant (EPA-HAP)
 #UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 °F and 14.696 psia. Pound "X"/scf = M% of "X" * MW of "X" / UGC

To be conservative, the following "worst-case" values were assumed:

Compound	CAS	Formula	Representative Gas Analysis			Assumed "Worst-Case" Parameters		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	0.132	0.292	153.32	0.172	0.381	200.00
Methane	75-82-8	CH4	81.024	65.263	34,253.57	99.348	75.000	42,000.00
Ethane	74-84-0	CH5	12.957	19.561	10,266.86	15.649	25.000	12,400.00
VOC (Propane)	74-98-6	C3H8	5.537	14.394	7,554.83	6.669	17.338	9,100.00
n-Hexane	110-54-3	C6H14	0.0535	0.2315	121.49	0.0661	0.2858	150.00
Benzene	71-43-2	C6H6	0.0012	0.0047	2.47	0.0049	0.0191	10.00
Toluene	108-88-3	C7H8	0.0030	0.0139	7.28	0.0041	0.0191	10.00
Ethylbenzene	100-41-4	C8H10	0.0000	0.0000	0.00	0.0300	0.1500	10.00
Xylenes	1330-20-7	C8H10	0.0047	0.0251	13.15	0.0300	0.1500	20.00
Total HAP:	Various	C6 thru C8	0.0627	0.2768	145.30	0.0863	0.3811	200.00

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Waste Gas Composition - Old Process Flare

<http://www.chemindustry.com/apps/chemicals>

Compound	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fraction (M%/Sum-M%)	Weighted Sum (MW*MF)	Weight % (WS/Sum-WS)	lb/MMscf (WS/UGC#)
Nitrogen	7727-37-9	N2	28.013	0.0000	---	---	---	---
Hydrogen Sulfide	2148-87-8	H2S	34.086	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	0.1754	0.001761	0.0775	0.4243	204.24
Methane*	75-82-8	CH4	16.042	84.6798	0.850248	13.6401	74.6771	35,943.91
Ethane*	74-84-0	C2H6	30.069	14.0913	0.141487	4.2544	23.2920	11,211.02
Propane**	74-98-6	C3H8	44.096	0.6174	0.006199	0.2734	1.4966	720.34
i-Butane**	75-28-5	C4H10	58.122	0.0100	0.000100	0.0058	0.0320	15.38
n-Butane**	106-97-8	C4H10	58.122	0.0112	0.000112	0.0065	0.0358	17.22
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	0.0007	0.000007	0.0005	0.0029	1.39
n-Pentane**	109-66-0	C5H12	72.149	0.0008	0.000008	0.0006	0.0031	1.49
Cyclohexane**	110-82-7	C6H12	84.159	---	---	---	---	---
Other Hexanes**	varies	C6H14	86.175	0.0076	0.000077	0.0066	0.0362	17.42
Methylcyclohexane**	varies	C7H14	98.186	---	---	---	---	---
Heptanes**	varies	C7H16	100.202	---	---	---	---	---
C8+ Heavies**	varies	C8+	varies	---	---	---	---	---
n-Hexane***	110-54-3	C6H14	86.175	0.0000	0.000000	0.0000	0.0000	0.00
Benzene***	71-43-2	C6H6	78.112	0.0000	0.000000	0.0000	0.0000	0.00
Toluene***	108-88-3	C7H8	92.138	0.0000	0.000000	0.0000	0.0000	0.00
Ethylbenzene***	100-41-4	C8H10	106.165	0.0000	0.000000	0.0000	0.0000	0.00
Xylenes***	1330-20-7	C8H10	106.165	0.0000	0.000000	0.0000	0.0000	0.00
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	0.0000	0.000000	0.0000	0.0000	0.00

Totals:	99.59	1.0000	18.2654	100.00	48,132.42
THC:	99.42	0.9982	18.1879	99.58	47,928.18
Total VOC:	0.65	0.0065	0.2934	1.61	773.24
Total HAP:	0.00	0.0000	0.0000	0.00	0.00

* = Hydrocarbon (HC) ** = also Volatile Organic Compound (EPA-VOC) *** = also Hazardous Air Pollutant (EPA-HAP)

#UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 °F and 14.696 psia. Pound "X"/scf = M% of "X" * MW of "X" / UGC

To be conservative, the following "worst-case" values were assumed:

Compound	CAS	Formula	Representative Gas Analysis			Assumed "Worst-Case" Parameters		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	0.175	0.424	204.24	0.429	1.039	500.00
Methane	75-82-8	CH4	84.680	74.677	35,943.91	100.000	100.000	42,275.00
Ethane	74-84-0	C2H6	14.091	23.292	11,211.02	15.711	25.970	12,500.00
VOC (Propane)	74-98-6	C3H8	0.617	1.497	720.34	1.257	3.116	1,500
n-Hexane	110-54-3	C6H14	0.0000	0.0000	0.00	0.0250	0.1000	50.00
Benzene	71-43-2	C6H6	0.0000	0.0000	0.00	0.0250	0.1000	50.00
Toluene	108-88-3	C7H8	0.0000	0.0000	0.00	0.0250	0.1000	50.00
Ethylbenzene	100-41-4	C8H10	0.0000	0.0000	0.00	0.0250	0.1000	50.00
Xylenes	1330-20-7	C8H10	0.0000	0.0000	0.00	0.0250	0.1000	50.00
Total HAP:	Various	C6 thru C8	0.0000	0.0000	0.00	0.1250	0.5000	250.00

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Btu Analysis - Old Process Flare

Based on Streams Disposed in Old Flare Stack

Component	Formula	Molecular Weight (MW)	Component Btu/scf (LHV)	Combined Stream	
				Flow: 571 scfh	
				Mole %	Btu/scf
Water	H2O	15.999	0.0	---	---
Carbon Monoxide	CO	28.010	320.5	---	---
Nitrogen	N2	28.013	0.0	0.000	---
Oxygen	O2	31.999	0.0	---	---
Hydrogen Sulfide	H2S	34.086	586.8	---	---
Carbon Dioxide	CO2	44.010	0.0	---	---
Methane*	CH4	16.042	909.4	84.680	770.1
Ethane*	C2H6	30.069	1,618.7	14.091	228.1
Propane**	C3H8	44.096	2,314.9	0.617	14.3
i-Butane**	C4H10	58.122	3,000.4	---	---
n-Butane**	C4H10	58.122	3,010.8	---	---
Cyclopentane**	C5H10	70.100	3,512.1	---	---
i-Pentane**	C5H12	72.149	3,699.0	---	---
n-Pentane**	C5H12	72.149	3,706.9	---	---
2-Mbutane	C5H12	72.149	3,699.0	---	---
2-Mpentane	C6H14	86.175	4,395.2	---	---
3-Mpentane	C6H14	86.175	4,398.1	---	---
Heptanes**	C7H16	100.202	5,100.0	---	---
C8+ Heavies**	C8+	114.229 est	6,600.0 est	---	---
n-Hexane***	C6H14	86.175	4,403.8	---	---
Benzene***	C6H6	78.112	3,590.5	---	---
Toluene***	C7H8	92.138	4,273.7	---	---
Ethylbenzene***	C8H10	106.165	4,970.4	---	---
Xylenes***	C8H10	106.165	4,958.1	---	---
2,2,4-TMP***	C8H18	114.229	6,231.6	---	---

99.39

Btu/scf (LHV):	1,012.5
Btu/scf (HHV=LHV/0.9):	1,125.0
MMBtu/hr (LHV):	0.58
MMBtu/hr (HHV=LHV/0.9):	0.64

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Waste Gas Composition - New Process Flare

<http://www.chemindustry.com/apps/chemicals>

Compound	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fraction (M%/Sum-M%)	Weighted Sum (MW*MF)	Weight % (WS/Sum-WS)	lb/MMscf (WS/UGC#)
Nitrogen	7727-37-9	N2	28.013	0.4174	0.004177	0.1170	0.5581	308.35
Hydrogen Sulfide	2148-87-8	H2S	34.086	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	0.1866	0.001867	0.0822	0.3920	216.55
Methane*	75-82-8	CH4	16.042	75.2147	0.752647	12.0743	57.5938	31,817.89
Ethane*	74-84-0	C2H6	30.069	16.7533	0.167644	5.0409	24.0448	13,283.64
Propane**	74-98-6	C3H8	44.096	5.2315	0.052350	2.3084	11.0110	6,083.07
i-Butane**	75-28-5	C4H10	58.122	0.4943	0.004946	0.2875	1.3713	757.60
n-Butane**	106-97-8	C4H10	58.122	1.1000	0.011007	0.6397	3.0515	1,685.83
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	0.1811	0.001812	0.1307	0.6236	344.48
n-Pentane**	109-66-0	C5H12	72.149	0.1987	0.001988	0.1434	0.6842	378.00
Cyclohexane**	110-82-7	C6H12	84.159	0.0094	0.000094	0.0079	0.0379	20.94
Other Hexanes**	varies	C6H14	86.175	0.0644	0.000644	0.0555	0.2648	146.31
Methylcyclohexane**	varies	C7H14	98.186	0.0052	0.000052	0.0051	0.0245	13.52
Heptanes**	varies	C7H16	100.202	0.0242	0.000242	0.0242	0.1156	63.88
C8+ Heavies**	varies	C8+	114.229	0.0073	0.000073	0.0084	0.0400	22.0763
n-Hexane***	110-54-3	C6H14	86.175	0.0436	0.000437	0.0376	0.1795	99.16
Benzene***	71-43-2	C6H6	78.112	0.0007	0.000007	0.0005	0.0025	1.39
Toluene***	108-88-3	C7H8	92.138	0.0011	0.000011	0.0010	0.0048	2.66
Ethylbenzene***	100-41-4	C8H10	106.165	---	0.000000	0.0000	0.0000	0.00
Xylenes***	1330-20-7	C8H10	106.165	---	0.000000	0.0000	0.0000	0.00
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	---	0.000000	0.0000	0.0000	0.00

Totals:	99.93	1.0000	20.9646	100.00	55,245.34
THC:	99.33	0.9940	20.7654	99.05	54,720.44
Total VOC:	7.36	0.0737	3.6502	17.41	9,618.92
Total HAP:	0.05	0.0005	0.0392	0.19	103.21

* = Hydrocarbon (HC) ** = also Volatile Organic Compound (EPA-VOC) *** = also Hazardous Air Pollutant (EPA-HAP)
 #UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 °F and 14.696 psia. Pound "X"/scf = M% of "X" * MW of "X" / UGC

To be conservative, the following "worst-case" values were assumed:

Compound	CAS	Formula	Representative Gas Analysis			Assumed "Worst-Case" Parameters		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	0.187	0.392	216.55	0.431	0.905	500.00
Methane	75-82-8	CH4	75.215	57.594	31,817.89	82.737	63.354	35,000.00
Ethane	74-84-0	C2H6	16.753	24.045	13,283.64	16.396	23.531	13,000.00
VOC (Propane)	74-98-6	C3H8	7.316	17.224	9,618.92	9.507	22.384	12,500.00
n-Hexane	110-54-3	C6H14	0.0436	0.1795	99.16	0.2200	0.9051	500.00
Benzene	71-43-2	C6H6	0.0007	0.0025	1.39	0.2427	0.9051	500.00
Toluene	108-88-3	C7H8	0.0011	0.0048	2.66	0.2058	0.9051	500.00
Ethylbenzene	100-41-4	C8H10	---	0.0000	0.00	0.2000	0.9000	500.00
Xylenes	1330-20-7	C8H10	---	0.0000	0.00	0.2000	0.9000	500.00
Total HAP:	Various	C6 thru C8	0.0454	0.1868	103.21	1.0686	4.5152	2,500.00

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
 Application for Title V Operating Permit (45CSR30)

Btu Analysis - New Process Flare

Based on Streams Disposed in New Flare Stack

Component	Formula	Molecular Weight (MW)	Component Btu/scf (LHV)	Pilot + Purge Gas		Process + Maintenance		Combined Stream		
				Flow: 1,065 scfh		Flow: 5,694 scfh		Flow: 6,759 scfh		
				Mole %	Btu/scf	Mole %	Btu/scf	Mole %	Btu/scf	
Nitrogen	N2	28.013	0.0	---	---	0.496	---	0.417	---	
Hydrogen Sulfide	H2S	34.086	586.8	---	---	---	---	---	---	
Carbon Dioxide	CO2	44.010	0.0	0.175	---	0.189	---	0.187	---	
Methane*	CH4	16.042	909.4	84.680	770.1	73.444	667.9	75.215	684.0	
Ethane*	C2H6	30.069	1,618.7	14.091	228.1	17.251	279.2	16.753	271.2	
Propane**	C3H8	44.096	2,314.9	0.617	14.3	6.095	141.1	5.232	121.1	
i-Butane**	C4H10	58.122	3,000.4	0.010	0.3	0.585	17.5	0.494	14.8	
n-Butane**	C4H10	58.122	3,010.8	0.011	0.3	1.304	39.2	1.100	33.1	
Cyclopentane**	C5H10	70.100	3,512.1	---	---	---	---	---	---	
i-Pentane**	C5H12	72.149	3,699.0	0.001	0.0	0.215	7.9	0.181	6.7	
n-Pentane**	C5H12	72.149	3,706.9	0.001	0.0	0.236	8.7	0.199	7.4	
Cyclohexane**	C6H12	84.159	4,179.7	---	---	0.011	0.5	0.009	0.4	
Other Hexanes**	C6H14	86.175	4,403.8	0.008	0.3	0.075	3.3	0.064	2.8	
Methylcyclohexane**	C7H14	98.186	4,863.7	---	---	0.006	0.3	0.005	0.3	
Heptanes**	C7H16	100.202	5,100.0	---	---	0.029	1.5	0.024	1.2	
C8+ Heavies**	C8+	varies	114.2 est	---	---	0.009	0.0	0.007	0.0	
n-Hexane***	C6H14	86.175	4,403.8	---	---	0.052	2.3	0.044	1.9	
Benzene***	C6H6	78.112	3,590.5	---	---	0.001	0.0	0.001	0.02	
Toluene***	C7H8	92.138	4,273.7	---	---	0.001	0.1	0.001	0.05	
Ethylbenzene***	C8H10	106.165	4,970.4	---	---	---	---	---	---	
Xylenes***	C8H10	106.165	4,958.1	---	---	---	---	---	---	
2,4-Trimethylpentane**	C8H18	114.229	6,231.6	---	---	---	---	---	---	
				99.59	100.00			99.93		

Btu/scf (LHV):	1,013.5	1,169.6	1,145.0
Btu/scf (HHV=LHV/0.9):	1,126.1	1,299.6	1,272.2
MMBtu/hr (LHV):	1.08	6.66	Total: 7.74
MMBtu/hr (HHV=LHV/0.9):	1.20	7.40	8.60

SUPPLEMENT 06

Vendor Data

§45-30-4.3.c.8 - The application forms shall include calculations or test data on which the information is based.

ENGINE SPECIFICATIONS:

- Compressor Engine - 225 bhp CAT G342NA (CE-01 (1E))
- Compressor Engine - 625 bhp CAT G398TA (CE-02 (2E))
- Compressor Engine - 3,550 bhp CAT G3612LE (CE-03 (3E) thru CE-05 (5E))
- Emergency Generator Engine - 118 bhp Olympian G70LG (GE-01 (8E))

HEATER SPECIFICATIONS:

- TXP-01 Hot Oil Heater (H-01 (9E))
- TXP-01 Regeneration Gas Heater (H-02 (10E))
- TXP-02 and -03 Regeneration Gas Heaters (H-03 (11E) and H-04 (12E))
- TXP-02 and -03 Heat Medium Heaters (H-05 (13E) and H-06 (14E))

FLARE SPECIFICATIONS:

- New Process Flare – Zeeco Process Flare (FL-02 (18E))
-



Prepared For:
Mr. Alan Kane

INFORMATION PROVIDED BY CATERPILLAR

Engine: G342 NA HCR
Horsepower: 225
RPM: 1200
Compression Ratio: 10.5:1
Exhaust Flow Rate: 851 ft³/min
Exhaust Temperature: 1170 °F
Reference: LEBQ9194
Fuel: Natural Gas
Annual Operating Hours: 8760

Uncontrolled Emissions Data

NO_x: 12.90 g/bhp-hr
CO: 13.70 g/bhp-hr
THC: 1.80 g/bhp-hr
NMHC: N/A g/bhp-hr
NMNEHC: N/A g/bhp-hr
HCHO: N/A g/bhp-hr
Oxygen: 0.50 %

POST CATALYST EMISSIONS

NO_x: <0.1 g/bhp-hr
CO: <2.0 g/bhp-hr
VOC: <0.5 g/bhp-hr
HCHO: >76% reduction

CONTROL EQUIPMENT

Catalytic Converter

Model: EAS-1700T-0606F-22CEE
Catalyst Type: NSCR, Precious group metals
Manufacturer: EMIT Technologies, Inc.
Element Size: 17" x 3.5"
Catalyst Elements: 2
Housing Type: 2 Element Capacity
Catalyst Installation: Accessible Housing
Construction: 10 gauge Carbon Steel
Sample Ports: 6 (0.5" NPT)
Inlet Connections: 6" Flat Face Flange
Outlet Connections: 6" Flat Face Flange
Configuration: End In / End Out
Silencer: Integrated
Silencer Grade: Critical
Insertion Loss: 20-25 dBA

Air Fuel Ratio Controller

Part Number: ENG-S-125-T
Manufacturer: EMIT Technologies, Inc.
Description: EDGE NG Air Fuel
4-Wire Narrowband
Digital Power Valve
O2 Sensor
Wiring Harnesses
(2) 25' Type K
Digital Power Valve Size: 1.25" NPT



**Compressor Engine (CE-01 / 1E)
225 bhp CAT G342NA
(4SRB@1,200 rpm) w/ NSCR**

772 Airfield Lane
Sheridan, WY 82801
Office: 307.673.0883 | Direct 307.675.5052
cdosborn@emittechnologies.com

WARRANTY

EMIT Technologies, Inc. warrants that the goods supplied will be free from defects in workmanship by EMIT Technologies, Inc. for a period of one (1) year from date of shipment. EMIT Technologies, Inc. will not be responsible for any defects which result from improper use, neglect, failure to properly maintain or which are attributable to defects, errors or omissions in any drawings, specifications, plans or descriptions, whether written or oral, supplied to EMIT Technologies, Inc. by Buyer.

Catalyst performance will be guaranteed for a period of 1 year from installation, or 8760 operating hours, whichever comes first. The catalyst shall be operated with an automatic air/fuel ratio controller. The performance guarantee shall not cover the effects of excessive ash masking due to operation at low load, improper engine maintenance, or inappropriate lubrication oil. The performance guarantee shall not cover the effects of continuous engine misfires (cylinder or ignition) exposing the catalyst to excessive exothermic reaction temperatures.

The exhaust temperature operating range at the converter inlet is 600°F minimum for oxidation catalyst and 750 °F for NSCR catalyst and 1250°F maximum.

If a high temperature shut down switch is not installed, thermal deactivation of catalyst at temperatures above 1300 °F is not covered.

The catalyst conversion efficiencies (% reduction) will be guaranteed for engine loads of 50 to 100 percent.

Engine lubrication oil shall contain less than 0.6% ash (by weight) with a maximum allowable specific oil consumption of 0.01 gal/bhp-hr. The maximum ash loading on the catalyst shall be limited to 350 g/m³. Phosphorous and zinc additives are limited to 0.03% (by weight).

The catalyst must not be exposed to the following know poisoning agents, including: iron, nickel, sodium, chromium, arsenic, zinc, lead, phosphorous, silicon, potassium, magnesium, copper, tin, and mercury. Total poison concentrations in the gas are limited to 0.3 ppm.



Jun 27, 2011

Joey Owens
Exterran Energy Solutions LP
337 Industrial Dr
Oak Hill, WV 25901

Exterran
QHSE and Operations Services
16666 Northchase Drive
Houston, Texas 77060 U.S.A.

Main 281.836.7000
Fax 281.836.8161
www.exterran.com

Re: Engine Pedigree for Exterran Compressor Unit 70704, Engine Serial Number 73B01671

In order to better assist your company with any of its state and federal permitting needs, Exterran submits the following information in regards to the engine of the above-referenced compressor unit, which Exterran is currently utilizing to provide your company contract compression services. This letter should provide information necessary to answer questions pertaining to, but not limited to, the New Source Performance Standards (NSPS) for Stationary Spark Ignition Internal Combustion Engines, Subpart JJJJ. This information is current as of Jun 27, 2011.

Engine Make:	CATERPILLAR
Engine Model:	G398TAA
Engine Serial Number:	73B01671
Engine Type:	4 Stroke RB
Engine Category:	Existing
Engine Subcategory:	Non Certified
Engine NSPS Status*:	Exempt
Exemption Justification*:	Overhauls since 6/12/06 have not triggered recon./modif.
Engine Speed:	1200.00
OEM Rated HP:	625.00
Engine Manufacture Date:	Pre June 12, 2006
Customer:	N/A
Business Unit:	N/A
Exterran Unit Number:	70704
Customer Lease Name:	N/A

Please contact Kyle Poycker with any questions at or kyle.poycker@exterran.com.

* The "Engine NSPS Status" and "Exemption Justification" entries herein are based on Exterran's present knowledge of the engine in question and its reading of U.S. EPA's regulations and guidance pursuant to 40 C.F.R. Part 60, Subpart JJJJ. Any change in law or in the federal, state, or local interpretation of existing law could result in this engine being subject to additional or different legal requirements. These conclusions are Exterran's and are not offered as legal opinions or advice to your company. Additionally, any reconstruction or modification respecting this engine (as those terms are defined in the applicable regulations) could result in the applicability of Subpart JJJJ or other legal requirements to this engine and create legal compliance responsibilities for your company.

G398 EMISSIONS DATA @ STANDARD RATINGS

ENGINE	RATING (hp/rpm)	NOx	CO (gram/hp-hr)	HC	%O2	A/FR vol/vol	Tstack deg F	EXH FLOW cfm	AIR FLOW kg/hr	BSFC Btu/hp-hr
NA HCR	500/1200 stand/catalyst	12.7	13.7	2.0	0.5	9.5	1100	2251	1437	7800
NA HCR	412/1000 stand catalyst	18.3 11.2	0.8 12.1	1.2 1.7	2.0 0.5	10.5 9.5	1090 1101	1895 1838	1225 1139	7460 7669
NA LCR	450/1200 stand/catalyst	11.4	11.5	0.8	0.5	9.5	1202	2435	1459	8803
NA LCR	375/1000 stand catalyst	15.1 11.3	0.8 11.8	0.8 0.8	2.0 0.5	10.4 9.5	1000 1032	1778 1720	1220 1145	8273 8582
TA LCR	625/1200 stand catalyst	20.5 9.8	0.8 10.7	0.8 0.8	2.0 0.5	10.5 9.5	1040 1112	3053 3043	2040 1929	8026 8387
TA LCR	550/1000 stand catalyst	19.0 9.7	0.9 9.7	0.9 0.9	2.0 0.5	10.4 9.5	1004 1056	2558 2445	1750 1607	8011 8052
TA LCR	700/1200 stand	18.3	0.8	1.1	2.0	—	1096	3107	1999	7936
TA HCR	700/1200 stand catalyst	15.2 9.4	1.1 9.9	0.9 1.6	2.0 0.5	10.5 9.5	1103 1132	3278 3144	2155 1968	7778 7850
TA LCR	610/1000 stand	16.8	0.9	1.2	2.0	—	984	2484	1723	7846
TA HCR	610/1000 stand catalyst	14.9 8.9	0.8 9.6	1.1 1.8	2.0 0.5	10.5 9.5	1064 1075	2775 3032	1825 1698	7587 7804
TA HCR 32C LOW EMIS	700/1200 stand	5.0	1.8	1.4	6.2	13.6	1010	4482	3100	7843
TA HCR 32C LOW EMIS	610/1000 stand	5.0	1.2	2.0	7.8	14.2	950	3841	2770	7529
TA HCR 54C LOW EMIS	625/1200 stand	5.0	1.5	1.3	6.0	13.6	992	4136	2890	7791
TA HCR 54C LOW EMIS	550/1000 stand	5.0	1.3	1.7	6.7	14.2	929	3210	2350	7563



Prepared For:
Kyle Poycker
EXTERRAN

INFORMATION PROVIDED BY CATERPILLAR

Engine:	G398 TA LCR
Horsepower:	625
RPM:	1200
Compression Ratio:	7.0:1
Exhaust Flow Rate:	3043 CFM
Exhaust Temperature:	1112 °F
Reference:	LEBQ9194
Fuel:	Natural Gas
Annual Operating Hours:	8760

Uncontrolled Emissions

NOx:	9.80 g/bhp-hr
CO:	10.70 g/bhp-hr
THC:	0.80 g/bhp-hr
NMHC:	N/A
NMNEHC:	N/A
HCHO:	N/A
Oxygen:	0.50 %

POST CATALYST EMISSIONS

NOx:	<0.5 g/bhp-hr
CO:	<0.5 g/bhp-hr
VOC:	<0.04 g/bhp-hr
HCHO:	>76% Reduction

CONTROL EQUIPMENT

Catalytic Converter

Model:	EAS-2500T-0808F-21CEE
Catalyst Type:	NSCR, Precious group metals
Manufacturer:	EMIT Technologies, Inc.
Element Size:	Round 25 x 3.5
Catalyst Elements:	1
Housing Type:	2 Element Capacity
Catalyst Installation:	Accessible Housing
Construction:	10 gauge Carbon Steel
Sample Ports:	6 (0.5" NPT)
Inlet Connections:	8" Flat Face Flange
Outlet Connections:	8" Flat Face Flange
Configuration:	End In / End Out
Silencer:	Integrated
Silencer Grade:	Critical
Insertion Loss:	20-25 dBA

Air Fuel Ratio Controller

Model:	ENG-D-125-TA
Manufacturer:	EMIT Technologies, Inc.
Description:	EDGE NG Air Fuel Ratio Controller (2) 4-Wire Narrowband O2 Sensor (2) Digital Power Valve (2) O2 Sensor Weldment Armored Wiring Harness (2) 25' Type K Thermocouple
Digital Power Valve Size:	1.25" NPT



**Compressor Engine (CE-02 / 2E)
625 bhp CAT G398TA (4SRB@1,200 rpm) w/ NSCR**

772 Airfield Lane
Sheridan, WY 82801
Office: 307.673.0883
EST@emittechnologies.com

WARRANTY

EMIT Technologies, Inc. warrants that the goods supplied will be free from defects in workmanship by EMIT Technologies, Inc. for a period of one (1) year from date of shipment. EMIT Technologies, Inc. will not be responsible for any defects which result from improper use, neglect, failure to properly maintain or which are attributable to defects, errors or omissions in any drawings, specifications, plans or descriptions, whether written or oral, supplied to EMIT Technologies, Inc. by Buyer.

Catalyst performance will be guaranteed for a period of 1 year from installation, or 8760 operating hours, whichever comes first. The catalyst (Rich Burn Engines Only) shall be operated with an automatic air/fuel ratio controller. The performance guarantee shall not cover the effects of excessive ash masking due to operation at low load, improper engine maintenance, or inappropriate lubrication oil. The performance guarantee shall not cover the effects of continuous engine misfires (cylinder or ignition) exposing the catalyst to excessive exothermic reaction temperatures.

The exhaust temperature operating range at the converter inlet is 600°F minimum for oxidation catalyst and 750 °F for NSCR catalyst and 1250°F maximum.

If a high temperature shut down switch is not installed, thermal deactivation of catalyst at temperatures above 1300 °F is not covered.

The catalyst conversion efficiencies (% reduction) will be guaranteed for engine loads of 50 to 100 percent.

Engine lubrication oil shall contain less than 0.6% ash (by weight) with a maximum allowable specific oil consumption of 0.01 gal/bhp-hr. The maximum ash loading on the catalyst shall be limited to 350 g/m³. Phosphorous and zinc additives are limited to 0.03% (by weight).

The catalyst must not be exposed to the following known poisoning agents, including: iron, nickel, sodium, chromium, arsenic, zinc, lead, phosphorous, silicon, potassium, magnesium, copper, tin, and mercury. Total poison concentrations in the gas are limited to 0.3 ppm.

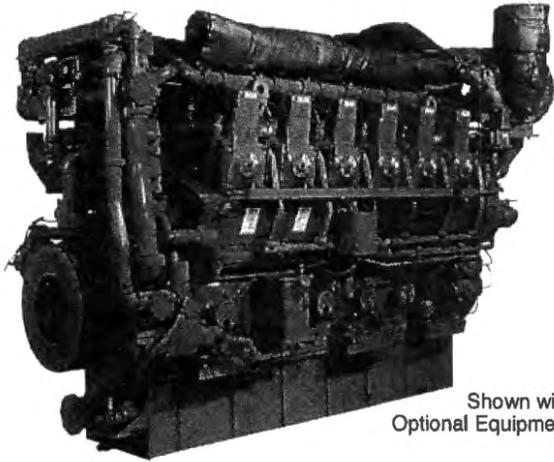


G3612 LE
Gas Petroleum
Engine

2647-2823 kW
 (3550-3785 bhp)
 1000 rpm

0.5 g/bhp-hr NOx or 0.7 g/bhp-hr NOx (NTE)

CAT® ENGINE SPECIFICATIONS



Shown with
Optional Equipment

V-12, 4-Stroke-Cycle

Bore	300 mm (11.8 in.)
Stroke	300 mm (11.8 in.)
Displacement	254 L (15,528 cu. in.)
Aspiration	Turbocharged-Aftercooled
Digital Engine Management	
Governor and Protection	Electronic (ADEM™ A3)
Combustion	Low Emission (Lean Burn)
Engine Weight	
net dry (approx)	25,084 kg (55,300 lb)
Power Density	8.9 kg/kW (14.6 lb/hp)
Power per Displacement	14.9 bhp/L
Total Cooling System Capacity	
Jacket Water	734.4 L (194 gal)
Aftercooler Circuit	670 L (177 gal)
Lube Oil System (refill)	64 L (17 gal)
Oil Change Interval	1030 L (272 gal)
Oil Change Interval	5000 hours
Rotation (from flywheel end)	Counterclockwise
Flywheel Teeth	255

FEATURES

Engine Design

- Proven reliability and durability
- Ability to burn a wide spectrum of gaseous fuels
- Robust diesel strength design prolongs life and lowers owning and operating costs
- Broad operating speed range

Emissions

Meets U.S. EPA Spark Ignited Stationary NSPS Emissions for 2010/11 with the use of an oxidation catalyst

Lean Burn Engine Technology

Lean-burn engines operate with large amounts of excess air. The excess air absorbs heat during combustion reducing the combustion temperature and pressure, greatly reducing levels of NOx. Lean-burn design also provides longer component life and excellent fuel consumption.

Ease of Operation

- High-strength pan and rails for excellent mounting and stability
- Side covers on block allow for inspection of internal components

Advanced Digital Engine Management

ADEM A3 engine management system integrates speed control, air/fuel ratio control, and ignition/detonation controls into a complete engine management system. ADEM A3 has improved: user interface, display system, shutdown controls, and system diagnostics.

Full Range of Attachments

Large variety of factory-installed engine attachments reduces packaging time.

Testing

Every engine is full-load tested to ensure proper engine performance.

Gas Engine Rating Pro

GERP is a PC-based program designed to provide site performance capabilities for Cat® natural gas engines for the gas compression industry. GERP provides engine data for your site's altitude, ambient temperature, fuel, engine coolant heat rejection, performance data, installation drawings, spec sheets, and pump curves.

Product Support Offered Through Global Cat Dealer Network

- More than 2,200 dealer outlets
- Cat factory-trained dealer technicians service every aspect of your petroleum engine
- Cat parts and labor warranty
- Preventive maintenance agreements available for repair-before-failure options

S•O•SSM program matches your oil and coolant samples against Caterpillar set standards to determine:

- Internal engine component condition
- Presence of unwanted fluids
- Presence of combustion by-products
- Site-specific oil change interval

Over 80 Years of Engine Manufacturing Experience

- Over 60 years of natural gas engine production
- Ownership of these manufacturing processes enables Caterpillar to produce high quality, dependable products
- Cast engine blocks, heads, cylinder liners, and flywheel housings
- Machine critical components
- Assemble complete engine

Web Site

For all your petroleum power requirements, visit www.catoilandgas.cat.com.

STANDARD EQUIPMENT

Air Inlet System

Air cleaner — standard duty
Inlet air adapter

Control System

A3 control system — provides electronic governing integrated with air/fuel ratio control and individual cylinder ignition timing control

Cooling System

Jacket water pump
Jacket water thermostats and housing
Aftercooler pump
Aftercooler water thermostats and housing
Single-stage aftercooler

Exhaust System

Dry wrapped exhaust manifolds
Vertical outlet adapter

Flywheel & Flywheel Housing

SAE standard rotation

Fuel System

Gas admission valves — electronically controlled fuel supply pressure

Ignition System

A3 control system — senses individual cylinder detonation and controls individual cylinder timing

Instrumentation

LCD display panel — monitors engine parameters and displays diagnostic codes

Lube System

Crankcase breathers — top mounted
Oil cooler
Oil filter
Oil pan drain valve

Mounting System

Engine mounting feet (six total)

Protection System

Electronic shutoff system with purge cycle
Crankcase explosion relief valves
Gas shutoff valve

Starting System

Air starting system

General

Paint — Cat yellow
Vibration dampers

OPTIONAL EQUIPMENT

Air Inlet System

Heavy-duty air cleaner with precleaners
Heavy-duty air cleaner with rain protection

Charging System

Charging alternators

Control System

Custom control system software — available for non-standard ratings, field programmable using flash memory

Cooling System

Expansion tank
Flexible connections
Jacket water heater

Exhaust System

Flexible bellows adapters
Exhaust expander
Weld flanges

Fuel System

Fuel filter
Gas pressure regulator
Flexible connection
Low energy fuel system
Corrosive gas fuel system

Ignition System

CSA certification

Instrumentation

Remote data monitoring and speed control
Compatible with Cat Electronic Technician (ET) and Data View
Communication Device — PL1000T/E
Display panel deletion is optional

Lube System

Air or electric motor-driven prelube
Duplex oil filter
LH or RH service
Lube oil makeup system

Mounting System

Mounting plates (set of six)

Power Take-Offs

Front stub shafts

Starting System

Air pressure reducing valve
Natural gas starting system

General

Engine barring device
Damper guard

TECHNICAL DATA



G3612 LE Gas Petroleum Engine — 1000 rpm

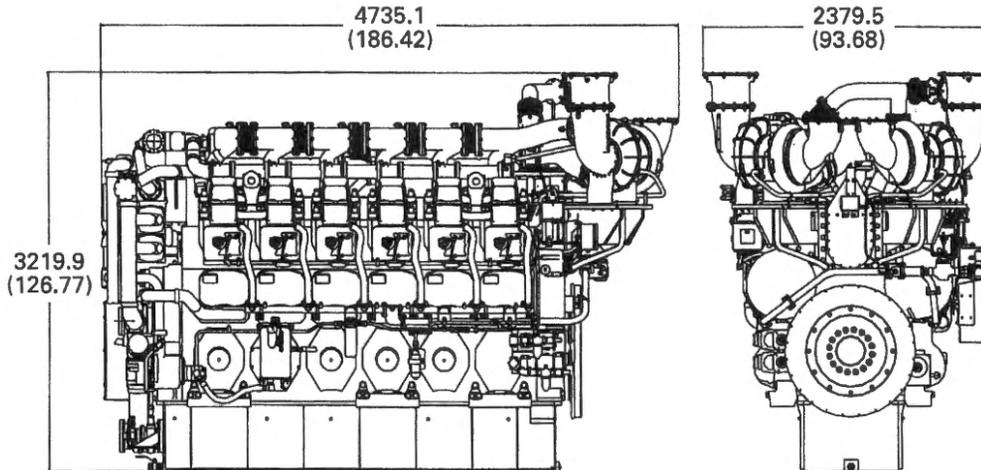
		DM5134-02	DM5309-05	DM5310-05	DM8607-01
Engine Power					
@ 100% Load	bkW (bhp)	2733 (3665)	2823 (3785)	2647 (3550)	2647 (3550)
@ 75% Load	bkW (bhp)	2050 (2729)	2117 (2839)	1985 (2663)	1985 (2663)
Engine Speed					
	rpm	1000	1000	1000	1000
Max Altitude @ Rated Torque and 38°C (100°F)					
	m (ft)	1219.2 (4000)	1219.2 (4000)	609.6 (2000)	304.8 (1000)
Speed Turndown @ Max Altitude, Rated Torque, and 38°C (100°F)					
	%	21	20	23	23
SCAC Temperature					
	°C (°F)	43 (110)	32 (90)	55 (130)	55 (130)
Emissions*					
NO _x	g/bkW-hr (g/bhp-hr)	0.94 (0.7)	0.94 (0.7)	0.94 (0.7)	0.67 (0.5)
CO	g/bkW-hr (g/bhp-hr)	3.4 (2.5)	3.4 (2.5)	3.4 (2.5)	3.7 (2.75)
CO ₂	g/bkW-hr (g/bhp-hr)	587 (438)	585 (436)	589 (439)	591 (441)
VOC**	g/bkW-hr (g/bhp-hr)	0.79 (0.59)	0.75 (0.56)	0.82 (0.61)	0.87 (0.65)
Fuel Consumption***					
@ 100% Load	MJ/bkW-hr (Btu/bhp-hr)	9.31 (6580)	9.28 (6561)	9.34 (6600)	9.38 (6629)
@ 75% Load	MJ/bkW-hr (Btu/bhp-hr)	9.7 (6856)	9.66 (6829)	9.74 (6883)	9.78 (6914)
Heat Balance					
Heat Rejection to Jacket Water					
@ 100% Load	bkW (Btu/min)	657 (37,360)	678 (38,565)	640 (36,401)	639 (36,360)
@ 75% Load	bkW (Btu/min)	576 (32,727)	594 (33,770)	546 (31,064)	548 (31,192)
Heat Rejection to Aftercooler					
@ 100% Load	bkW (Btu/min)	515 (29,299)	563 (32,045)	468 (26,661)	488 (27,783)
@ 75% Load	bkW (Btu/min)	281 (15,954)	310 (17,616)	252 (14,361)	264 (15,016)
Heat Rejection to Exhaust					
@ 100% Load	bkW (Btu/min)	2705 (153,813)	2743 (156,017)	2664 (151,486)	2673 (152,035)
@ 75% Load	bkW (Btu/min)	2152 (122,365)	2184 (124,184)	2132 (121,263)	2141 (121,731)
Exhaust System					
Exhaust Gas Flow Rate					
@ 100% Load	N·m ³ /bkW-hr (cfm)	690.14 (24,372)	705.85 (24,927)	674.20 (23,809)	682.15 (24,090)
@ 75% Load	N·m ³ /bkW-hr (cfm)	543.32 (19,187)	553.65 (19,552)	532.67 (18,811)	538.95 (19,033)
Exhaust Stack Temperature					
@ 100% Load	°C (°F)	453.30 (848)	448 (838)	459 (858)	448 (838)
@ 75% Load	°C (°F)	472.20 (882)	464 (867)	480 (896)	469 (876)
Intake System					
Air Inlet Flow Rate					
@ 100% Load	N·m ³ /bkW-hr (scfm)	265.78 (9386)	273.91 (9673)	257.66 (9099)	264.99 (9358)
@ 75% Load	N·m ³ /bkW-hr (scfm)	203.85 (7199)	210.00 (7416)	197.71 (6982)	203.34 (7181)
Gas Pressure					
	kPag (psig)	295-324 (42.8-47)	295-324 (42.8-47)	295-324 (42.8-47)	295-324 (42.8-47)

*at 100% load and speed, all values are listed as not to exceed

**Volatile organic compounds as defined in U.S. EPA 40 CFR 60, subpart JJJJ

***ISO 3046/1

GAS PETROLEUM ENGINE



DIMENSIONS		
Length	mm (in)	4735.1 (186.42)
Width	mm (in)	2379.5 (93.68)
Height	mm (in)	3219.9 (126.77)
Shipping Weight	kg (lb)	25,084 (55,300)

Note: General configuration not to be used for installation. See general dimension drawings for detail.

RATING DEFINITIONS AND CONDITIONS

Engine performance is obtained in accordance with SAE J1995, ISO3046/1, BS5514/1, and DIN6271/1 standards.

Transient response data is acquired from an engine/generator combination at normal operating temperature and in accordance with ISO3046/1 standard ambient conditions. Also in accordance with SAE J1995, BS5514/1, and DIN6271/1 standard reference conditions.

Conditions: Power for gas engines is based on fuel having an LHV of 33.74 kJ/L (905 Btu/cu ft) at 101 kPa (29.91 in. Hg) and 15° C (59° F). Fuel rate is based on a cubic meter at 100 kPa (29.61 in. Hg) and 15.6° C (60.1° F). Air flow is based on a cubic foot at 100 kPa (29.61 in. Hg) and 25° C (77° F). Exhaust flow is based on a cubic foot at 100 kPa (29.61 in g) and stack temperature.

Materials and specifications are subject to change without notice. The International System of Units (SI) is used in this publication. CAT, CATERPILLAR, their respective logos, S-O-S, ADEM, "Caterpillar Yellow" and the "Power Edge" trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.



Compressor Engines (CE-03 thru -05 / 3E thru 5E)
3,550 bhp CAT G3612LE (4SLB@1,000 rpm)
Compressor Engines w/ OxCat (3X)
(Each)

Prepared For:
Kyle Poycker
EXTERRAN

QUOTE: QUO-07132-H8J5
Expires: September 13, 2012

INFORMATION PROVIDED BY CATERPILLAR

Engine: G3612
Horsepower: 3550
RPM: 1000
Compression Ratio: 9.0:1
Exhaust Flow Rate: 24013 CFM
Exhaust Temperature: 838 °F
Reference: DM8607-02
Fuel: Natural Gas
Annual Operating Hours: 8760

Uncontrolled Emissions

	<u>g/bhp-hr</u>	<u>Lb/Hr</u>	<u>Tons/Year</u>
NOx:	0.50	3.91	17.14
CO:	2.75	21.52	94.27
THC:	6.46	50.56	221.45
NMHC	1.82	14.25	62.42
NMNEHC:	0.65	5.05	22.13
HCHO:	0.26	2.06	9.02

O2: 12.80 %

POST CATALYST EMISSIONS

	<u>% Reduction</u>	<u>g/bhp-hr</u>	<u>Lb/Hr</u>	<u>Tons/Year</u>
NOx:	Unaffected by Oxidation Catalyst			
CO:	>90 %	<0.28	<2.15	<9.43
VOC:	>51 %	<0.32	<2.47	<10.80
HCHO:	>85 %	<0.04	<0.31	<1.37

CONTROL EQUIPMENT

Catalytic Converter

Model: **ELH-5000Z-1820F-43CEE-36 (QTY 2 Housings)**
Catalyst Type: Oxidation, Precious group metals
Manufacturer: EMIT Technologies, Inc.
Element Size: Rectangle 36 x 15 x 3.5
Catalyst Elements: 3 (6 Total)
Housing Type: 4 Element Capacity
Catalyst Installation: Accessible Housing
Construction: 10 gauge Carbon Steel
Sample Ports: 9 (0.5" NPT)
Inlet Connections: 18" Flat Face Flange
Outlet Connections: 20" Flat Face Flange
Configuration: End In / End Out
Silencer: Integrated
Silencer Grade: Hospital
Insertion Loss: 35-40 dBA



**Compressor Engines (CE-03 thru -05 / 3E thru 5E)
3,550 bhp CAT G3612LE (4SLB@1,000 rpm)
Compressor Engines w/ OxCat (3X)
(Each)**

PRICING

ELH-5000Z-1820F-43CEE-36

Carbon Steel

Quantity

2

WARRANTY

EMIT Technologies, Inc. warrants that the goods supplied will be free from defects in workmanship by EMIT Technologies, Inc. for a period of one (1) year from date of shipment. EMIT Technologies, Inc. will not be responsible for any defects which result from improper use, neglect, failure to properly maintain or which are attributable to defects, errors or omissions in any drawings, specifications, plans or descriptions, whether written or oral, supplied to EMIT Technologies, Inc. by Buyer.

Catalyst performance using an EMIT Air/Fuel ratio controller is dependent upon properly defined set-points, variable with engine and fuel gas composition. Air/fuel ratio controller performance is guaranteed, but not limited, to fuel gas with a HHV content of 1400 BTU/SCF.

Catalyst performance will be guaranteed for a period of 1 year from installation, or 8760 operating hours, whichever comes first. The catalyst shall be operated with an automatic air/fuel ratio controller. The performance guarantee shall not cover the effects of excessive ash masking due to operation at low load, improper engine maintenance, or inappropriate lubrication oil. The performance guarantee shall not cover the effects of continuous engine misfires (cylinder or ignition) exposing the catalyst to excessive exothermic reaction temperatures. In most cases, excluding thermal deactivation, catalyst performance is redeemable by means of proper washing (refer to EMIT Catalyst/Silencer Housing Manual for element wash information, or contact a local EMIT Sales representative).

The exhaust temperature operating range at the converter inlet is a minimum of 600°F for oxidation catalyst and 750 °F for NSCR catalyst, and a maximum of 1250°F.

If a properly functioning, high temperature shut down switch is not installed, thermal deactivation of catalyst at sustained temperatures above 1250°F is not covered. If excessive exposure to over oxygenation of NSCR catalyst occurs due to improperly functioning or non-existent Air/Fuel ratio control, then deactivation of catalyst is not warranted.

The catalyst conversion efficiencies (% reduction) will be guaranteed for engine loads of 50 to 100 percent. Standard Oxidation Catalyst conversion efficiencies (% reduction) will be guaranteed for fuel gas containing less than 1.5% mole fraction of non-methane, non-ethane hydrocarbons. Applications where fuel gas exceeds this level will require a Premium Oxidation Catalyst to maintain guaranteed VOC conversion efficiencies.

Engine lubrication oil shall contain less than 0.5 wt% Sulfated Ash with a maximum allowable specific oil consumption of 0.7 g/bhp-hr. The catalyst shall be limited to a maximum ash loading of 0.022 lb/ft³. Phosphorous and zinc additives are limited to 0.03 wt%. New or Reconstructed engines must operate for a minimum of 100 hours prior to catalyst installation, otherwise the warranty is void.

The catalyst must not be exposed to the following know poisoning agents, including: antimony, arsenic, chromium, copper, iron, lead, lithium, magnesium, mercury, nickel, phosphorous, potassium, silicon, sodium, sulfur, tin, and zinc. Total poison concentrations in the fuel gas must be limited to 0.25 ppm or less for catalyst to function properly.

Shipment - Promised shipping dates are approximate lead times from the point of manufacture and are not guaranteed. EMIT Technologies, Inc. will not be liable for any loss, damage or delay in manufacture or delivery resulting from any cause beyond its control including, but not limited to a period equal to the time lost by reason of that delay. All products will be crated as per best practice to prevent any damage during shipment. Unless otherwise specified, Buyer will pay for any special packing and shipping requirements. Acceptance of goods by common carrier constitutes delivery to Buyer. EMIT Technologies, Inc. shall not be responsible for goods damaged or lost in transit.

Terms: Credit is extended to purchaser for net 30 time period. If payment is not received in the net 30 timeframe, interest on the unpaid balance will accrue at a rate of 1.5% per month from the invoice date.

Order Cancellation Terms: Upon cancellation of an order once submittal of a Purchase Order has occurred, the customer will pay a 25% restocking fee for Catalyst Housings, Catalyst Elements, and Air/Fuel Ratio Controllers; 50% restocking fee for Cooler Top Solutions, Exhaust System Accessories, and other Custom Built Products; 100% of all associated shipping costs incurred by EMIT; 100% of all project expenses incurred by EMIT for Field Services.



**Compressor Engine (CE-03 / 3E)
 3,550 bhp CAT G3612LE (4SLB@1,000 rpm)
 Compressor Engines w/ OxCat**

Oct 23, 2012

Chip Fenske
 Exterran Energy Solutions
 114 Cornerstone Drive
 Marietta, OH 45750

Exterran
 QHSE and Operations Services
 16666 Northchase Drive
 Houston, Texas 77060 U.S.A.

Main 281.836.7000
 Fax 281.836.8161
 www.exterran.com

Re: Engine Pedigree for Exterran Compressor Unit 77434, Engine Serial Number 1YG00128

In order to better assist your company with any of its state and federal permitting needs, Exterran submits the following information in regards to the engine of the above-referenced compressor unit, which Exterran is currently utilizing to provide your company contract compression services. This letter should provide information necessary to answer questions pertaining to, but not limited to, the New Source Performance Standards (NSPS) for Stationary Spark Ignition Internal Combustion Engines, Subpart JJJJ. This information is current as of Oct 23, 2012.

Engine Make:	CATERPILLAR
Engine Model:	G3612LE
Engine Serial Number:	1YG00128
Engine Type:	4 Stroke LB
Engine Category:	Existing
Engine Subcategory:	Non Certified
Engine NSPS Status*:	Exempt
Exemption Justification*:	Overhauls since 6/12/06 have not triggered recon./modif.
Engine Speed:	1000.00
OEM Rated HP:	3550.00
Engine Manufacture Date:	Jan 09, 1998
Customer:	CAIMAN EASTERN MIDSTREAM LLC
Business Unit:	Northeast
Exterran Unit Number:	77434
Customer Lease Name:	FORT BEELER RECOMPRESSOR #1

Please contact Erin Badough with any questions at 281-836-7514 or erin.badough@exterran.com.

* The "Engine NSPS Status" and "Exemption Justification" entries herein are based on Exterran's present knowledge of the engine in question and its reading of U.S. EPA's regulations and guidance pursuant to 40 C.F.R. Part 60, Subpart JJJJ. Any change in law or in the federal, state, or local interpretation of existing law could result in this engine being subject to additional or different legal requirements. These conclusions are Exterran's and are not offered as legal opinions or advice to your company. Additionally, any reconstruction or modification respecting this engine (as those terms are defined in the applicable regulations) could result in the applicability of Subpart JJJJ or other legal requirements to this engine and create legal compliance responsibilities for your company.



**Compressor Engine (CE-04 / 4E)
3,550 bhp CAT G3612LE (4SLB@1,000 rpm)
Compressor Engines w/ OxCat**

Oct 23, 2012

Chip Fenske
Exterran Energy Solutions
114 Cornerstone Drive
Marietta, OH 45750

Exterran
QHSE and Operations Services
16666 Northchase Drive
Houston, Texas 77060 U.S.A.

Main 281.836.7000
Fax 281.836.8161
www.exterran.com

Re: Engine Pedigree for Exterran Compressor Unit 77476, Engine Serial Number 1YG00256

In order to better assist your company with any of its state and federal permitting needs, Exterran submits the following information in regards to the engine of the above-referenced compressor unit, which Exterran is currently utilizing to provide your company contract compression services. This letter should provide information necessary to answer questions pertaining to, but not limited to, the New Source Performance Standards (NSPS) for Stationary Spark Ignition Internal Combustion Engines, Subpart JJJJ. This information is current as of Oct 23, 2012.

Engine Make:	CATERPILLAR
Engine Model:	G3612LE
Engine Serial Number:	1YG00256
Engine Type:	4 Stroke LB
Engine Category:	Existing
Engine Subcategory:	Non Certified
Engine NSPS Status*:	Exempt
Exemption Justification*:	No overhauls since 6/12/06
Engine Speed:	1000.00
OEM Rated HP:	3550.00
Engine Manufacture Date:	Apr 02, 2002
Customer:	CAIMAN EASTERN MIDSTREAM LLC
Business Unit:	Northeast
Exterran Unit Number:	77476
Customer Lease Name:	FORT BEELER RECOMPRESSOR #2

Please contact Erin Badough with any questions at 281-836-7514 or erin.badough@exterran.com.

* The "Engine NSPS Status" and "Exemption Justification" entries herein are based on Exterran's present knowledge of the engine in question and its reading of U.S. EPA's regulations and guidance pursuant to 40 C.F.R. Part 60, Subpart JJJJ. Any change in law or in the federal, state, or local interpretation of existing law could result in this engine being subject to additional or different legal requirements. These conclusions are Exterran's and are not offered as legal opinions or advice to your company. Additionally, any reconstruction or modification respecting this engine (as those terms are defined in the applicable regulations) could result in the applicability of Subpart JJJJ or other legal requirements to this engine and create legal compliance responsibilities for your company.



**Compressor Engine (CE-05 / 5E)
3,550 bhp CAT G3612LE (4SLB@1,000 rpm)
Compressor Engines w/ OxCat**

Oct 23, 2012

Chip Fenske
Exterran Energy Solutions
114 Cornerstone Drive
Marietta, OH 45750

Exterran
QHSE and Operations Services
16666 Northchase Drive
Houston, Texas 77060 U.S.A.

Main 281.836.7000
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www.exterran.com

Re: Engine Pedigree for Exterran Compressor Unit 77757, Engine Serial Number BKE00301

In order to better assist your company with any of its state and federal permitting needs, Exterran submits the following information in regards to the engine of the above-referenced compressor unit, which Exterran is currently utilizing to provide your company contract compression services. This letter should provide information necessary to answer questions pertaining to, but not limited to, the New Source Performance Standards (NSPS) for Stationary Spark Ignition Internal Combustion Engines, Subpart JJJJ. This information is current as of Oct 23, 2012.

Engine Make:	CATERPILLAR
Engine Model:	G3612LE
Engine Serial Number:	BKE00301
Engine Type:	4 Stroke LB
Engine Category:	Existing
Engine Subcategory:	Non Certified
Engine NSPS Status*:	Exempt
Exemption Justification*:	No overhauls since 6/12/06
Engine Speed:	1000.00
OEM Rated HP:	3550.00
Engine Manufacture Date:	Jan 31, 2006
Customer:	CAIMAN EASTERN MIDSTREAM LLC
Business Unit:	Northeast
Exterran Unit Number:	77757
Customer Lease Name:	FORT BEELER RECOMPRESSOR #3

Please contact Erin Badough with any questions at 281-836-7514 or erin.badough@exterran.com.

* The "Engine NSPS Status" and "Exemption Justification" entries herein are based on Exterran's present knowledge of the engine in question and its reading of U.S. EPA's regulations and guidance pursuant to 40 C.F.R. Part 60, Subpart JJJJ. Any change in law or in the federal, state, or local interpretation of existing law could result in this engine being subject to additional or different legal requirements. These conclusions are Exterran's and are not offered as legal opinions or advice to your company. Additionally, any reconstruction or modification respecting this engine (as those terms are defined in the applicable regulations) could result in the applicability of Subpart JJJJ or other legal requirements to this engine and create legal compliance responsibilities for your company.

OLYMPIAN™

2014 EPA SPARK-IGNITED EXHAUST EMISSIONS DATA

Effective since 2009, the EPA has implemented exhaust emissions regulations on stationary spark-ignited (gaseous) engine generators for emergency applications. All Olympian spark-ignited gensets, including LG and LTA series gensets, that are built with engines manufactured in 2009 and later meet the requirements of 40CFR part 60 subpart JJJJ and are EPA certified. These generator sets are labeled as EPA Certified with decals affixed to the engines' valve cover(s).

The attached documents summarize the general information relevant to EPA certification on these generator sets. This information can be used for submittal data and for permitting purposes, if required. These documents include the following information:

EPA Engine Family

The EPA Engine Family is assigned by the Manufacturer under EPA guidelines for certification purposes and appears on the EPA certificate.

Catalyst Required

Indicates whether an exhaust catalyst and Air/Fuel Ratio control system are required on the generator set to meet EPA certification requirements. Generally, units rated 80kW and smaller do not require a catalyst to meet EPA certification requirements. Please note that some units that do not require a catalyst to meet EPA requirements do need a catalyst if the California SCAQMD option is selected. Please see "California SCAQMD" below for additional information on this option.

Combination Catalyst or Separate Catalyst

LG series generator sets typically utilize a single combination catalyst/silencer as part of meeting EPA certification requirements. Many LTA series generator sets use the same engines as LG series units, but have different exhaust configurations that require the use of conventional silencers with additional separate catalysts installed.

EPA Certificate Number

Upon certification by the EPA, a Certificate Number is assigned by the EPA.

Emissions Actuals - Grams/bhp-hr

Actual exhaust emission data for Total Hydrocarbons (THC), Nitrogen Oxides (NOx) and Carbon Monoxide (CO) that were submitted to EPA and are official data of record for certification. This data can be used for permitting if necessary. Values are expressed in grams per brake horsepower-hour; to convert to grams/kW-hr, multiply by 1.341. Please see advisory notes below for further information.

California Units, SCAQMD CEP Number

A separate low-emissions option is available on many Olympian gaseous-fueled generator sets to comply with the more stringent South Coast Air Quality Management District requirements that are recognized in certain areas in California. Gensets that include this option are also EPA Certified.

General Advisory Note to Dealers

The information provided here is proprietary to Olympian and its' authorized dealers. This information may only be disseminated upon request, to regulatory governmental bodies for emissions permitting purposes or to specifying organizations as submittal data when expressly required by project specifications, and shall remain confidential and not open to public viewing. This information is not intended for compilation or sales purposes and may not be used as such, nor may it be reproduced without the expressed written permission of Olympian Power Systems, Inc.

Advisory Notes on Emissions Actuals

- The stated values are actual exhaust emission test measurements obtained from units representative of the generator types and engines described.
- Values are official data of record as submitted to the EPA and SCAQMD for certification purposes. Testing was conducted in accordance with prevailing EPA protocols, which are typically accepted by SCAQMD and other regional authorities.
- No emission values provided are to be construed as guarantees of emissions levels for any given Olympian generator unit.
- Olympian Power Systems reserves the right to revise this information without prior notice.
- Consult state and local regulatory agencies for specific permitting requirements.
- The emissions performance data supplied by the equipment manufacturer is only one element required toward completion of the permitting and installation process. State and local regulations may vary on a case-by-case basis and must be consulted by the permit applicant/equipment owner prior to equipment purchase or installation. The data supplied herein by Olympian Power Systems cannot be construed as a guarantee of installability of the generator set.
- The emission values provided are the result of multi-mode, weighted scale testing in accordance with EPA testing regulations, and may not be representative of any specific load point.
- The emission values provided are not to be construed as emission limits.

OLYMPIAN™

2014 EPA Certified Gas Industrial Generators - Non California Units

	Model	Engine	EPA Engine Family	Fuel	CAT Req'd	Comb Cat or Separate Cat	EPA Cert #	Grams/bhp-hr.			Rated RPM	BHP	Fuel Flow (lb/hr)
								THC	NOx	CO			
Small Spark Ignited Engines - SSIE (SORE)	G25LTA	2.4	EGNXB02.42NN	NG	No	NR	EGNXB02.42NN-008	2.14	2.37	93.95	1800	38.39	16.52
	G25LTA	2.4	EGNXB02.42NL	LPG	No	NR	EGNXB02.42NL-003	1.43	4.38	86.18	1800	43.29	17.59
	G35LG	5.4	EGNXB05.42NN	NG	No	NR	EGNXB05.42NN-012	1.60	2.52	95.32	1800	82.10	36.91
	G35LG	5.4	EGNXB05.42NL	LPG	No	NR	EGNXB05.42NL-013	1.24	3.45	112.01	1800	82.30	34.60
	G40LG	5.4	EGNXB05.42NN	NG	No	NR	EGNXB05.42NN-012	1.60	2.52	95.32	1800	82.10	36.91
	G40LG	5.4	EGNXB05.42NL	LPG	No	NR	EGNXB05.42NL-013	1.24	3.45	112.01	1800	82.30	34.60
	G45LG	5.4	EGNXB05.42NN	NG	No	NR	EGNXB05.42NN-012	1.60	2.52	95.32	1800	82.10	36.91
	G45LG	5.4	EGNXB05.42NL	LPG	No	NR	EGNXB05.42NL-013	1.24	3.45	112.01	1800	82.30	34.60
	G50LG	5.4	EGNXB05.42NN	NG	No	NR	EGNXB05.42NN-012	1.60	2.52	95.32	1800	82.10	36.91
	G50LG	5.4	EGNXB05.42NL	LPG	No	NR	EGNXB05.42NL-013	1.24	3.45	112.01	1800	82.30	34.60
	G50LG	6.8	EGNXB06.82NN	NG	No	NR	EGNXB06.82NN-001	1.46	6.57	30.88	1800	84.90	37.17
	G50LG	6.8	EGNXB06.82NL	LPG	No	NR	EGNXB06.82NN-002	1.86	2.67	172.30	1800	84.66	46.55
	G60LG	6.8	EGNXB06.82NN	NG	No	NR	EGNXB06.82NN-001	1.47	2.94	75.88	1800	96.67	38.76
	G60LG	6.8	EGNXB06.82NL	LPG	No	NR	EGNXB06.82NN-002	1.26	4.23	99.05	1800	96.60	41.20
	G70LG	6.8	EGNXB06.82NN	NG	No	NR	EGNXB06.82NN-001	1.46	3.55	68.40	1800	109.72	42.37
	G70LG	6.8	EGNXB06.82NL	LPG	No	NR	EGNXB06.82NN-002	1.26	3.28	111.49	1800	118.41	51.86
	G80LG	9.0	EGNXB08.92NN	NG	No	NR	EGNXB08.92NN-003	0.94	3.91	41.13	1800	125.96	44.32
	G80LG (DF)	9.0	EGNXB08.92NN	NG/LPV	No	NR	EGNXB08.92NN-003	0.76	2.81	42.10	1800	124.83	46.19
G80LG (DF)	9.0	EGNXB08.92NN	NG/LPL	No	NR	EGNXB08.92NN-003	0.69	2.89	30.46	1800	124.61	44.16	
G80LG	9.0	EGNXB08.92NL	LPV	No	NR	EGNXB08.92NL-004	0.78	2.67	78.16	1800	126.21	49.55	
G80LG	9.0	EGNXB08.92NL	LPL	No	NR	EGNXB08.92NL-004	1.11	4.02	67.70	1800	120.57	50.62	
Large Spark-Ignited Engines - (LSIE)	G130LG	6.8	EGNXB06.82C3	NG	Yes	Cat Muff	EGNXB06.82C3-031	0.06	0.05	0.92	3000	193.49	72.31
	G130LG	6.8	EGNXB06.82C4	LPG	Yes	Cat Muff	EGNXB06.82C4-032	0.03	0.21	1.06	3000	208.48	79.99
	G130LG (DF)	6.8	EGNXB06.82C3	NG & LP	Yes	Cat Muff	EGNXB06.82C3-031	0.06	0.05	0.92	3000	193.49	72.31
	G150LG	6.8	EGNXB06.82C3	NG	Yes	Cat Muff	EGNXB06.82C3-031	0.18	0.14	1.54	3600	231.00	91.34
	G150LG	6.8	EGNXB06.82C4	LPG	Yes	Cat Muff	EGNXB06.82C4-032	0.03	1.18	1.56	3600	230.13	89.41
	G150LG (DF)	6.8	EGNXB06.82C3	NG & LP	Yes	Cat Muff	EGNXB06.82C3-031	0.18	0.14	1.54	3600	231.00	91.34
	G100LG	9.0	EGNXB08.92C1	NG	Yes	Cat Muff	EGNXB08.92C1-034	0.17	0.003	0.06	1800	148.90	46.86
	G100LG (DF)	9.0	EGNXB08.92C1	NG/LPV	Yes	Cat Muff	EGNXB08.92C1-034	0.30	0.400	0.79	1800	133.16	45.36
	G100LG (DF)	9.0	EGNXB08.92C1	NG/LPL	Yes	Cat Muff	EGNXB08.92C1-034	0.34	0.006	1.10	1800	135.75	45.47
	G100LG	9.0	EGNXB08.92C2	LPG	Yes	Cat Muff	EGNXB08.92C2-035	0.03	0.08	0.13	1800	157.67	53.08
	G100LG	9.0	EGNXB08.92C2	LPL	Yes	Cat Muff	EGNXB08.92C2-035	0.07	0.04	0.30	1800	156.15	54.47
	G150LG	12.9	EGNXB12.92C2	NG	Yes	Cat Muff	EGNXB12.92C2-039	0.53	0.13	0.53	1800	307.87	107.99
	G175LG	12.9	EGNXB12.92C2	NG	Yes	Cat Muff	EGNXB12.92C2-039	0.53	0.13	0.53	1800	307.87	107.99
	G200LG	12.9	EGNXB12.92C2	NG	Yes	Cat Muff	EGNXB12.92C2-039	0.53	0.13	0.53	1800	307.87	107.99
	G230LG	12.9	EGNXB12.92C2	NG	Yes	Cat Muff	EGNXB12.92C2-039	0.38	0.03	0.53	1800	379.10	125.30
	G250LG	12.9	EGNXB12.92C2	NG	Yes	Cat Muff	EGNXB12.92C2-039	0.38	0.03	0.53	1800	379.10	125.30
G275LG	12.9	EGNXB12.92C3	NG	Yes	Cat Muff	EGNXB12.92C3-041	0.06	0.06	0.81	2150	477.00	164.20	
G300LG	12.9	EGNXB12.92C3	NG	Yes	Cat Muff	EGNXB12.92C3-041	0.06	0.06	0.81	2150	477.00	164.20	

(DF): Dual Fuel NR: Not Required

TXP-01 Hot Oil Heater (H-01 / 9E)
10.0 MMBtu/hr
(8.402 MMBtu/hr / 0.84 eff. = 10.0 MMBtu/hr)

THOMAS RUSSELL CO.
 Tulsa, Oklahoma

JOB NO: TRJ-211
 CLIENT: Chesapeake Energy
 SUBJECT: 120 MM Cryo Plant

DATE: 11/13/2008
 BY: JRG

FIRED HEATER

Service: HMO Heater	Tag No: H-781
Design Duty, MBTU/Hr: 8,402	Type: Helical Coil
No. of Coils per Unit: One	No. Units: One
Model: Heatec HCI-8010-50-G	

Fluid	Therminol 55				Burners		
		Inlet	Outlet		Gas	Oil	
Liquids	Lbs/Hr	129,300	129,300	LHV (BTU/cf)	900		
Density	Lbs/CuFt	51.55	48.75	Mol. Wt.	16.2		
Molecular Weight		320	320	Gravity			
Specific Heat	BTU/Lb °F	0.5135	0.5695	Pressure Avail. (psig)	100		
Thermal Cond.	BTU/Hr-Ft-°F	0.0697	0.0652	Pressure Req'd (psig)			
Viscosity	cP	3.74	1.25	Steam for Atomizing			
Vapor	Lbs/Hr	0	0	Fuel Gas Req'd (MSCFD)	173.2	N/A	
Density	Lbs/CuFt			Mfr:	Eclipse Ratiomatic 2000		
Molecular Weight				Type:	Forced Draft - 20 Hp Blower		
Specific Heat	BTU/Lb °F			Number Req'd	One		
Thermal Cond.	BTU/HrFt °F			Pilots Req'd	Yes, electric ignition		
Viscosity	cP			Nox	< 65 ppmvd		
Operating Temp.	°F	190	310	Structural Design			
Operating Pressure	PSIA	75	55	Wind Load, MPH, (3)			
Velocity	Ft/Sec	Allow.	Calc.	Seismic Zone, (3)			
Pressure Drop	PSI	20 Allow.	Calc.	Ambient, °F -20 / 110			
Fouling Resistance	SqFt*F/BTU	0.002		Elevation, Ft 3000			
Design Press. / Temp.		150 PSIG	400 °F	Stack Design			
Min. Design Mtl. Temp.		-20 °F @	150 PSIG	Self-supporting Yes			
Corrosion Allowance		0.0625		Minimum Height 8 ft above top of heater			
Insulation Thickness		3" - 5" Ceramic Fiber on Interior		Minimum Wall Thickness: 0.125			
Efficiency-Based on LHV (%)		84.0%	(Assume 3% Loss)	Lining Type No			
Excess Air		15%		Lining Thickness: No			
Firebox Unit Heat Release		25,300	BTU/Hr- Ft ³	Damper: No			
Number of Passes		One - process, Two - fireside					

Coil Design	Radiant	Convection-Bare	Convection-Finned
Gas Temperature In/Out	190 / 310		
Number Tubes	One		
Tube O.D. In	5" Sch. 40	5"300# ANSI RFWN Flg.	Inlet and Outlet
Tube Length Eff. Ft	----		
Bare Surface Sq Ft	1,130		
Finned Surface Sq Ft	N/A		
Avg. Heat Flux BTU/Hr-Sq Ft	13,241		
Tube Materials	SA- 106 Gr. B	SA-	SA-

Convection Fins (inch):	Height:	Thickness:	No. / inch:	Material:
Overall Dimension:	29' - 2" L x 8' - 9" W x 10' - 0" H (less stack)		28,300 lbs dry weight	
Code Requirements:	ASME VIII Div I	Stamp: Yes	Nat'l Board: Yes	

Notes:

- 1) Add 15% to duty and flow rates for design.
- 2) See attached Scope of Supply.
- 3) Wind design per ASCE 7-05, I=1.15, Exposure C. Seismic design per ASCE 7-05, I=1.25, Site D, S_s=100%, S_i=40%.
- 4) Electrical power to be 480 v / 3 ph / 60 hz. Control enclosures to be NEMA 4.
- 5) Add spare ignitor.

REVISION	A			
ENGINEER/DATE	JRG	11/13/08		
ISSUED FOR		RFQ		

TXP-01 Regen Gas Heater (H-02 / 10E)
4.74 MMBtu/hr
(4.079 MMBtu/hr / 0.86 eff. = 4.74 MMBtu/hr)

THOMAS RUSSELL CO.
 Tulsa, Oklahoma

JOB NO: TRJ-211
 CLIENT: Chesapeake Energy
 SUBJECT: 120 MM Cryo Plant

DATE: 7/31/2008
 BY: AHO

FIRED HEATER

Service: Regen Gas Heater		Tag No: H-741		
Design Duty, MBTU/Hr: 4079		Type: Helical Coil		
No. of Coils per Unit: One	No. Units: One	Model: Heatec HCI-4010-40-G		
Fluid	Regen Gas		Burners	
	Inlet	Outlet	Gas	Oil
Liquids Lbs/Hr			LHV (BTU/cf)	905
Density Lbs/CuFt			Mol. Wt.	16.2
Molecular Weight			Gravity	
Specific Heat BTU/Lb °F			Pressure Avail. (psig)	100
Thermal Cond. BTU/Hr-Ft-°F			Pressure Req'd (psig)	10
Viscosity cP			Steam for Atomizing	
Vapor Lbs/Hr	15293	15293	Fuel Gas Req'd (MSCFD)	129.56
Density Lbs/CuFt	3.803	1.871	Mfgr:	Eclipse WINOx
Molecular Weight	21.43	21.43	Type:	Forced Draft - 20 Hp Blower
Specific Heat BTU/Lb °F	0.6041	0.7047	Number Req'd	One
Thermal Cond. BTU/Hr-Ft °F	0.02298	0.04196	Pilots Req'd	Yes, electric ignition
Viscosity cP	0.01427	0.0199	NOx	40 ppmvd
Operating Temp. °F	130	550	Structural Design	
Operating Pressure PSIA	950	940	Wind Load, MPH, (3)	
Velocity Ft/Sec		Calc.	Seismic Zone, (3)	
Pressure Drop PSI	10 Allow.	2 Calc.	Ambient, °F	-20 / 110
Fouling Resistance SqFt°F/BTU	0.001		Elevation, Ft	3000
Design Press. / Temp.	1095 PSIG	650 °F	Stack Design	
Min. Design Mtl. Temp.	-20 °F @	1095 PSIG	Self-supporting	Yes
Corrosion Allowance	0.0625		Minimum Height	8 ft above top of heater
Insulation Thickness	3-5" high temp ceramic fiber		Minimum Wall Thickness:	0.125
Efficiency-Based on LHV (%)	86.0%	(Assume 3% Loss)	Lining Type	No
Excess Air	15		Lining Thickness:	No
Firebox Unit Heat Release	32,900	BTU/Hr- Ft³	Damper:	No
Number of Passes	One - process , Two fireside			
Coil Design		Radiant	Convection-Bare	Convection-Finned
Gas Temperature In/Out	89 / 550			
Number Tubes	One			
Tube O.D. In	Single Circuit 4"	4" 900# ANSI RTJ Flg	Inlet and Outlet	
Tube Length Eff. Ft	----			
Bare Surface Sq Ft	569			
Finned Surface Sq Ft	N/A			
Avg. Heat Flux BTU/Hr-Sq Ft	8,084			
Tube Materials	SA-106 Gr.B Sch 80	SA-	SA-	
Convection Fins (inch):	Height:	Thickness:	No. / inch:	Material:
Overall Dimension:	20' - 4" L x 6' - 0" W x 7' - 0" H (Less Stack)			Dry Weight: 14,600 lbs
Code Requirements:	ASME VIII Div I	Stamp: Yes	Nat'l Board:	Yes
Notes:				
1) Add 30% to duty and add 10% to flow rates for design.				
2) See attached Scope of Supply.				
3) Wind design per ASCE 7-05, I=1.15, Exposure C. Seismic design per ASCE 7-05, I=1.25, Site D. , S _s =100% , S ₁ =40%				
4) Electrical power to be 480 v / 3 ph / 60 hz. Control enclosures to be NEMA 4.				
5) Add spare ignitor.				
REVISION	A	0	1	
ENGINEER/DATE	AHO 7/31/08	DDO 9/3/08	JRG 12/9/08	
ISSUED FOR	Check Rate	Purchase	Revised Process	

THOMAS RUSSELL CO.
Tulsa, Oklahoma

TXP-02 and TXP-03 Regen Gas Heaters (Each)
(H-03 and -04 / 11E and 12e)
6.60 MMBtu/hr (Each)
(5.605 MMBtu/hr / 0.85 eff. = 6.60 MMBtu/hr)

JOB NO: 231
CLIENT:
SUBJECT: 200 MMscfd Cryo Plant

DATE: 9/21/2010
BY: JRG
231-13

FIRED HEATER

Service: Regen Gas Heater Tag No: H-741
Design Duty, MBTU/Hr 5605 Type: Helical Coil
No. of Coils per Unit One No. Units: One Model: Heatec HCI-5010-40-G

Fluid	Regen Gas				Burners		
		Inlet	Outlet			Gas	Oil
Liquids	Lbs/Hr	0	0		LHV (BTU/cf)	973	
Density	Lbs/CuFt				Mol. Wt.	18.26	
Molecular Weight					Gravity		
Specific Heat	BTU/Lb °F				Pressure Avail. (psig)	100	
Thermal Cond.	BTU/Hr-Ft-°F				Pressure Req'd (psig)	10	
Viscosity	cP				Steam for Atomizing		
Vapor	Lbs/Hr	20840	20840		Fuel Gas Req'd (MSCFD)	167.53	N/A
Density	Lbs/CuFt	3.824	1.885		Mfgr:	Eclipse WiNOX	
Molecular Weight		21.57	21.57		Type:	Forced Draft - 20 Hp Blower	
Specific Heat	BTU/Lb °F	0.6169	0.7189		Number Req'd	One	
Thermal Cond.	BTU/HrFt °F	0.0232	0.0422		Pilots Req'd	Yes, electrical ignition	
Viscosity	cP	0.0143	0.0198		NOx	40 ppm	
Operating Temp.	°F	135	550		Structural Design		
Operating Pressure	PSIA	949	939		Wind Load, MPH, (3)	90, Exp.C, I=1.15, Cf=0.7	
Velocity	Ft/Sec	Allow.	28.7	Calc.	Seismic Zone, (3)	I = 1.25	
Pressure Drop	PSI	10	Allow.	6	Ambient, °F	-20 / 110	
Fouling Resistance	SqFt*F/BTU	0.001			Elevation, Ft	750	
Design Press. / Temp.		1095	PSIG	650	°F	Stack Design	
Min. Design Mtl. Temp.		-20	°F @	1095	PSIG	Self-supporting	Yes
Corrosion Allowance		0.0625			Minimum Height	8 ft above top of heater	
Insulation Thickness		3" - 5" ceramic fiber on the interior			Minimum Wall Thickness:	0.125	
Efficiency-Based on LHV (%)		85.0%	(Assume 3% Loss)			Lining Type	No
Excess Air		15			Lining Thickness:	No	
Firebox Unit Heat Release		27,800	BTU/Hr- Ft ³			Damper:	No
Number of Passes		One - process, Two - fireside					

Coil Design		Radiant	Convection-Bare	Convection-Finned
Gas Temperature	In/Out	135 / 550		
Number Tubes		One		
Tube O.D.	In	Single Circuit 4"	4" 900# RTJ Fig	Inlet and Outlet
Tube Length	Eff. Ft	-----		
Bare Surface	Sq Ft	697		
Finned Surface	Sq Ft	N/A		
Avg. Heat Flux	BTU/Hr-Sq Ft	8,278		
Tube Materials		SA-106 Gr.B Sch 80	SA-	SA-

Convection Fins (inch): Height: Thickness: No. / inch: Material:
Overall Dimension: 25' - 8" L x 7' - 0" W x 8' - 6" H (less stack) Dry Weight: 18,450 lbs
Code Requirements: ASME VIII Div I Stamp: Yes Nat'l Board: Yes

- Notes:**
- 1) Add 30% to duty and 10% flow rates for design.
 - 2) See attached Scope of Supply.
 - 3) Wind design per ASCE 7-05, I=1.15, Exposure C. Seismic design per ASCE 7-05, I=1.25, Site D., S_s =40% , S₁ =8%
 - 4) Electric power to be 480 v / 3 ph / 60 hz. Control enclosures to be NEMA 4.
 - 5) Add Spare ignitor.

REVISION	A	0
ENGINEER/DATE	JRG 9/21/10	JRG 9/21/10
ISSUED FOR	RFQ	Purchase

THOMAS RUSSELL CO.
Tulsa, Oklahoma

TXP-02 and TXP-03 Heat Medium Heaters (Each)
(H-05 and -06 / 13E and 14e)
21.11 MMBtu/hr (Each)
(17.400 MMBtu/hr / 0.82 eff. = 21.22 MMBtu/hr)

JOB NO: TRJ-231
CLIENT: Wilson Midstream Services
SUBJECT: 200 MMscfd Cryo Plant

DATE: 9/21/2010
BY: JRG

FIRED HEATER

Service: HMO Heater for E-207		Tag No: H-781	
Design Duty, MBTU/Hr 17,400		Type: Helical Coil	
No. of Coils per Unit	One	No. Units:	One
▲ Model: HCI-10010-40(D)-G			
Fluid	50:50 TEG - Water		Burners
	Inlet	Outlet	Gas Oil
Liquids Lbs/Hr	333,142	333,142	LHV (BTU/scf) 973
Density Lbs/CuFt	64.15	62.56	Mol. Wt. 18.26
Molecular Weight	32.17	32.17	Gravity
Specific Heat BTU/Lb °F	0.859	0.882	Pressure Avail. (psig) 100
Thermal Cond. BTU/Hr-Ft-°F	0.223	0.220	Pressure Req'd (psig)
Viscosity cP	1.186	0.831	Steam for Atomizing
Vapor Lbs/Hr	0	0	Fuel Gas Req'd (MSCFD) 539.10 N/A
Density Lbs/CuFt			Mfgr: Eclipse Ratiomatic
Molecular Weight			Type: ▲ Forced Draft - 40 HP Blower
Specific Heat BTU/Lb °F			Number Req'd One
Thermal Cond. BTU/HrFt °F			Pilots Req'd (Note 4) Yes, electrical ignition
Viscosity cP			NOx ▲ < 75 ppmvd
Operating Temp. °F	195	255	Structural Design
Operating Pressure PSIA	90		Wind Load, MPH, (3)
Velocity Ft/Sec		▲ 8 Calc.	Seismic Zone, (3)
Pressure Drop PSI	20 Allow.	▲ 17 Calc.	Ambient, °F -20 / 110
Fouling Resistance SqFt²F/BTU	0.0020		Elevation, Ft 1300
Design Press. / Temp.	150 PSIG	400 °F	Stack Design
Min. Design Mtl. Temp.	-20 °F @	150 PSIG	Self-supporting Yes
Corrosion Allowance	0.125		Minimum Height 8 ft above top of heater
Insulation Thickness	3-5" high temp ceramic fiber		Minimum Wall Thickness: 0.125
Efficiency-Based on LHV (%)	▲ 82.0% (Assume 3% Loss)		Lining Type No
Excess Air	15		Lining Thickness: No
Firebox Unit Heat Release	▲ 28,834 BTU/Hr- Ft³		Damper: No
Number of Passes	▲ Two - Process, Two - Fireside		
Coil Design	Radiant	Convection-Bare	Convection-Finned
Gas Temperature In/Out	195 / 255		
Number Tubes	▲ Two		
Tube O.D. In	▲ 4" Sch 40		
Tube Length Eff. Ft	----		
Bare Surface Sq Ft	▲ 1,453		
Finned Surface Sq Ft	N/A		
Avg. Heat Flux BTU/Hr-Sq Ft	▲ 15,235		
Tube Materials	SA- 106 Gr. B SA- SA-		
Convection Fins (inch):	Height:	Thickness:	No. / inch: Material:
Overall Dimension:	▲ 25.9' L x 9.2' W x 10' H (Less Stack)		▲ 30,000 lbs Dry Weight
Code Requirements:	ASME VIII Div I		Stamp: Yes Nat'l Board: Yes
Notes:	1) Add 10% to duty and flow rates for design. 2) See attached Scope of Supply. 3) Wind design per ASCE 7-05, I=1.15, Exposure C. Seismic design per ASCE 7-05, I=1.25, Site D. , S _S =40% , S ₁ =8% 4) Add Spare ignitor		
REVISION	▲ 3		0
ENGINEER/DATE	JRG 1/11/11	JRG 9/21/10	GER 11/22/10 JRG 1/10/11
ISSUED FOR	Revised - Purchase		Purchase Revised Revised

COMMERCIAL PROPOSAL

Scope of Supply - BASE

Our scope of supply will include:

- 1) General Arrangement Drawings for customer approval.
- 2) Operation & Maintenance Manual.
- 3) The equipment necessary for flaring the waste streams as specified in the inquiry documents, including:

190-ft Tall Air Flare Package Identical to the Williams Moundsville Flare:

Air Assisted Flare Tip with Integral Velocity Seal & 3 Pilots
 Self-supported Flare Stack
 Manual/Automatic FFG Ignition System with Fuel Gas Train
 Process Engineering & Design Work for the Complete Flare System
 Utility Piping & Supports Along Flare Stack from Tip to Near Grade
 Retractable Thermocouple System with JB Near Grade
 One (1) Vane Axial Air Blower with Bird Screen / Inlet Bell and VFD Suitable Motor
 Blower Silencer
 Flare Stack Baseplate Template

We have considered the following changes in our Design/Offer:

- Smokeless capacity as listed for each case.
- Blower quantity increased to 2 blowers
- Thermocouples changed to dual element type
- Allowable nozzle loads increased to 2 x API 537 values
- Gas riser reduced to 20" diameter.
- Wind and Seismic Design Changed to the Following:

For IBC 2012 / ASCE 7-10 use the following wind and seismic design criteria:

WIND:

Risk Category = III
 Basic Wind Speed = 120 mph
 Exposure Category = C
 Topographic Factor (K_{zt}) = 1.0

SEISMIC:

Risk Category = III
 Importance Factor (I_E) = 1.25
 Mapped Spectral Response
 Accelerations:
 $S_S = 0.103g$
 $S_1 = 0.055g$
 Site Class: D
 Spectral Response Coefficients:
 $S_{D5} = 0.110g$
 $S_{D1} = 0.087g$
 Seismic Design Category = B
 Mapped Long Period Transition Period (T_L) = 12 sec

NOTE: Additional changes (changes in inlet elevation, orientation, materials, etc) will increase the delivery time for

COMMERCIAL PROPOSAL

Scope of Supply (Continued)

Our Scope of Supply does NOT include:

- 1) Stack or Piping External Insulation, Fireproofing, or Heat Tracing.
- 2) Field Assembly and / or Erection.
- 3) Commissioning, Start-up, Supervision, Training, etc. (PER DIEM BASIS).
- 4) Foundation Design / Supply or Civil Engineering.
- 5) Interconnecting Piping, Wiring or Conduit Between Stack Base and LCP.
- 6) Ocean or Inland Freight to Jobsite.
- 7) Shop Details / Fabrication Drawings of Proprietary Equipment.
- 8) Any Containerization of Equipment for Shipment or Storage Purposes.
- 9) Blank
- 10) Foundation Imbedded Anchor Bolts.
- 11) Spare Parts Quoted Separately and Priced Lists Included in Proposal.
- 12) Any Motor Starters or Motor Drivers or Motor Controls.
- 13) Any Third Party Inspection / Testing / Certification Services.
- 14) Flare KO drum.
- 15) Aircraft Warning Light System
- 16) HEI Ignition System

BASE OFFER



Process Conditions -- English Units

Client:	Williams	Zeeco Ref.: T33007F	Date:	13-Mar-14
Location:	West Virginia	Client Ref.: Ft. Beeler Flare	Rev.	3

	Mol %					
	Case 1	Case 2	Case 3	Case 4	Case E	Case F
METHANE	24.30	0.00	79.31	80.19		
ETHANE	8.66	1.38	13.60	14.71		
PROPANE	56.94	96.22	4.15	3.89		
BUTANE	8.08	2.40	1.58	0.71		
PENTANE	1.46	0.00	0.52	0.04		
HEXANE	0.19	0.00	0.13			
HEPTANE	0.05	0.22	0.03			
OCTANE	0.08		0.01			
NONANE	0.05					
DECANE						
DODECANE						
TRIDECANE						
CYCLOPENTANE						
ETHYLENE						
PROPYLENE						
BUTYLENE						
ACETYLENE						
BENZENE						
TOLUENE						
XYLENE						
CARBON MONOXIDE						
CARBON DIOXIDE	0.07		0.15	0.16		
HYDROGEN SULFIDE						
SULFUR DIOXIDE						
AMMONIA						
AIR						
HYDROGEN						
OXYGEN						
NITROGEN	0.11	0.07	0.30	0.30		
WATER						
BUTADIENE						
METHANOL						
Total	100	100	100	100		
Mol. Wt.	37.79	44.48	20.24	19.60		
L. H. V. (BTU/SCF):	1,995	2,334	1,112	1,080		
Temperature (Deg. F):	317.0	98.5	24.4	-31.8		
Avail. Static Pressure (psig):	27.00	6.70	0.10	2.00		
Flow Rate (lbs/hr):	383,000	229,194	9,115	97,470		
Smokeless Rate (lbs/hr):	70,000	57,299	9,115	22,000		



Air Assisted Flare Tip Specification Sheet

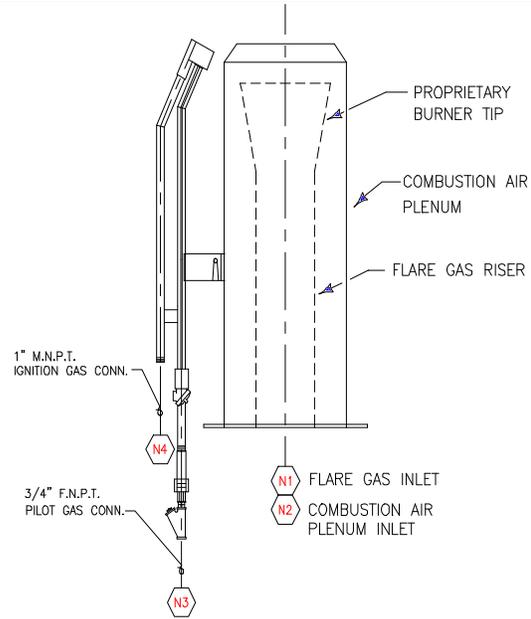
Client: Williams	Zeeco Ref.: T33007F	Date: 13-Mar-14
Location: West Virginia	Client Ref.: Ft. Beeler Flare	Rev. 3

General Information:

Tag No.:	FLR-01	Type: Air-Assisted
Model:	AFTA-20/56	
Length:	10'- 0 "	
Weight:	4000 lbs	
No. of pilots:	3	

Design Case:

Governing Case:	Case 1
Molecular weight:	37.8
L. H. V. :	1,995 BTU/SCF
Temperature:	317 Deg. F
Available Static Pressure:	27 psig
Design Flow Rate:	383,000 lbs/hr
Governing Smokeless Case:	Case 2
Design Smokeless Rate:	70000 lbs/hr
Approx Exit Velocity (per 40 CFR):	859 ft/s
Approx Exit Velocity:	1074 ft/s
Mach No.:	1.00
Approx. Tip Press. Drop:	24.00 psig



Construction:

Upper Section:	310 SS	Windshield:	NO
Lower Section:	Carbon Steel	Flame retention Ring:	310 SS
Refractory:	NA	Lifting Lugs:	NO
Refractory Thk:	NA		

Surface Finish (Carbon Steel Surfaces):

Surface Preparation:	SSPC-SP6	Primer:	Inorganic Zinc
Paint (c. s. surfaces):	High Heat Aluminum		

Connections:

	Qty.	Size	Type	Material
N1 - Flare Gas Inlet:	1	20 "	Beveled ; Weld	LTCS
N2 - Combustion Air Inlet:	1	56 "	Fab. Plate Flange	Carbon Steel
N3 - Pilot Gas Manifold:	1	1.00	FNPT	Carbon Steel
N4 - Ignition Line:	3	1 "	SW	304 SS

Miscellaneous Notes:

1. Includes Integral Purge Reducing Velocity Seal.
2. Required Fuel Gas Purge Rate = 870 SCFH.
3. Flare system is designed for 99% destruction efficiency or better.



Pre-Mix Flare Pilot Assembly Specification Sheet

Client:	Williams	Zeeco Ref.:	T33007F	Date:	13-Mar-14
Location:	West Virginia	Client Ref.:	Ft. Beeler Flare	Rev.	3

General Information:

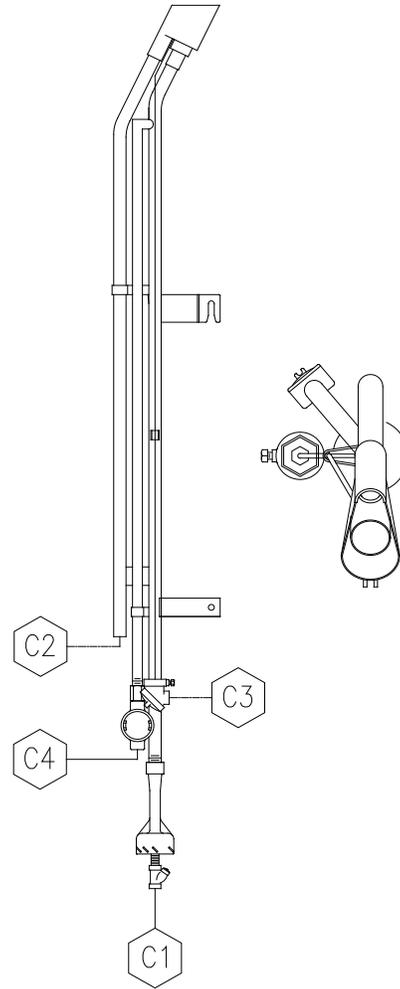
Tag No.:	FP-1
Model:	HSLF
Length:	9.135 feet
Weight:	68 lbs.
Pilot Type:	Pre-Mix High Stability
Ignition Type:	Flame Front Generator

Process Design Data:

Design Heat Release:	65,000 BTU/hr
Fuel Gas MW:	18.00
Fuel Gas LHV:	1,000 BTU/SCF
Fuel Gas Temperature:	100 Deg. F
Fuel Gas Inlet Pressure:	15.00 psig
Fuel Gas Flow rate:	65.0 SCFH
Design Wind Velocity:	150 mph
Design Rainfall:	10.00 inches/hr
Mounting Position:	Vertical
Thermocouple Type:	K Ungrounded

Construction:

Pilot Firing Tip:	HK
Windshield Assembly:	HK
Integral Thermowell:	HK
FFG Ignition Line:	310 SS
Mounting Brackets:	HK
Premix Fuel Line:	310 SS
Thermocouple Sheath:	310 SS
Thermocouple Head:	Cast Iron w/ Ceramic Term.
Fuel Mixer / Spud Assembly:	CF-3M / 18-8
Fuel Strainer Assembly:	CF-8M



Connections:	Qty.	Size	Type	Material
C1 - Fuel Gas Inlet:	1	1/2"	FNPT	CF8M
C2 - FFG Ignition Inlet:	1	1 "	150# RFSW	310 SS
C3 - Thermocouple:	1	1/2"	Tube	316SS

Misc. Notes: (see ignition system datasheet for type applicable to this quote)

- Upper mounting bracket is reinforced hook type for pilot removal from platform.
- Pilot mounting brackets and thermocouple mounting brackets are investment cast assemblies.
- Pilot mixer assembly is investment cast, high efficiency computer modeled venturi section.
- Thermocouples are retractable type (replaceable from grade).



Flame Front Generator Specification Sheet

Client: Williams	Zeeco Ref.: T33007F	Date: 13-Mar-14
Location: West Virginia	Client Ref.: Ft. Beeler Flare	Rev. 3

General Information:

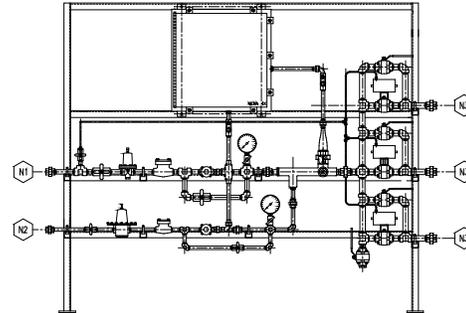
Tag No.:	IGN-1
Model No.:	LMC-3-T/S
Operation:	Manual/Automatic
No. of Pilots Ignited:	3
Area Classification:	Class 1, Div 2, Gr C/D

Fuel Gas Data:

Molecular Weight:	18.0
L. H. V.:	1,000 BTU/SCF
Temperature:	100 deg. F
Pressure:	15 psig

Utility Consumption:

Pilot Gas (Per Pilot):	65 SCFH
Pilot Gas (Total):	195 SCFH
Ignition Gas (Intermittent):	110 SCFH
Ignition Air (Intermittent):	1,100 SCFH
Power Available:	120 Volt, 1 Phase, 60 Hertz



(Typical drawing only)

Construction:

Ignition Line Piping:	Carbon Steel	Ignition Chamber:	Cast Iron
Fuel Gas Piping:	Carbon Steel	No. Thermocouples/Pilot:	1
Mounting Rack:	Carbon Steel	Thermocouple Type:	K
Enclosure:	NEMA 4X w/ Z-Purge	Propane Backup:	No
Sun / Rain Shield:	Yes	Ignition Air PCV:	Yes
Pilot Gas PCV:	Yes		

Surface Finish (Carbon Steel Surfaces):

Surface Preparation:	SSPC-SP1	Primer:	Red Oxide
Paint (c. s. surfaces):	Grey Enamel		

Connections:	Qty.	Size	Type	Material
N1 - Instrument Air Inlet:	1	1/2"	3000# Thrd. Union	Galvanized C.S.
N2 - Pilot Gas Inlet:	1	1/2"	3000# Thrd. Union	Carbon Steel
N3 - Ignition Gas Outlet:	3	1 "	3000# Thrd. Union	Carbon Steel
Pilot Gas Out. (Not Shown):	1	1 "	3000# Thrd. Union	Carbon Steel

Miscellaneous Notes:

1. Ignition panel includes AB Controllogix PLC w/ Ethernet Communication.



Blower Specification Sheet - BASE

Client: Williams	Zeeco Ref.: T33007F	Date: 13-Mar-14
Location: West Virginia	Client Ref.:	Ft. Beeler Flare Rev. 3

General Information:

Tag No.: BLW-1/2

Purpose of Blower: Smokeless Flaring

Blower Type: Vane Axial

Qty of Blowers: 2

Horsepower (each): 125

Blower Speeds: 1-speed VFD Suitable



(Typical Picture)

Controls / Electrical:

Haz Rating: Class 1, Div 2, Gr C/D

Motor Horsepower: 125.0 hp

Motor Voltage: 460 volts

Motor Power Frequency: 60 hertz

Motor Power Phase: 3 phase

Motor Type: NEC

Motor Enclosure: TEAO

Motor Safety Factor: 1.0

Construction and Mounting:

Mounting: Hang from Stack

Rotor Material: Aluminum

Housing Material: Carbon Steel

Paint: Manuf Std.

Accessories:

Bird Screen

Inlet Bell

240V space heater

Silencer Included

Backflow Damper for 2nd Stage Blower

Misc. Notes:

1. Blower staging logic is in customer DCS
2. Blower VFD supplied by others.
3. Stage 1 blower operates on VFD (by others)
4. Stage 2 Blower is 1-speed on/off only

SUPPLEMENT 07
Storage Tank Data Sheet
(Insignificant Emission Units)

General Form – 4.24.19: Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NO_x, SO₂, VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year (5 tpy) aggregate total for each criteria pollutant from all emission units.

General Form – 4.24.20: Emission units which do not have any applicable requirements and which emit hazardous air pollutants (HAP) into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year (0.5 tpy) aggregate total for all HAPs from all emission sources.

Please specify all emission units for which this exemption applies along with the quantity of pollutants emitted on an hourly and annual basis:

SUPPLEMENT 07 - Storage Tank Data Sheet (Insignificant Emissions Units)

Source ID	Contents	Orientation	Volume (gal)	Thru-Put (gal/yr)	VOC		HAP	
					lb/hr	tpy	lb/hr	tpy
T-01	Condensate (Meter Prover Skid Tank)	Removed						
T-02 (T-02)	Wastewater Tank (60 Site 880 Tank)	Vertical	8,820	8,400,000	---	---	---	---
T-05	Diesel Fuel	Horizontal	500	2,000	2.2E-05	9.5E-05	---	---
T-06	Gasoline	Horizontal	300	2,000	0.02	0.07	---	---
T-07	Methanol (TXP1)	Horizontal	3,000	6,000	0.01	0.04	---	---
T-08	Lube Oil (Tank 4401)	Vertical	4,200	25,200	---	---	---	---
T-09	Glycol (TK-2902 Slop Tank)	Vertical	3,460	41,520	---	---	---	---
T-10	Glycol (TK-2902A Slop Tank)	Vertical	4,200	50,400	---	---	---	---
T-11	Glycol (Groves Tank)	Horizontal	225	2,700	---	---	---	---
T-12	Methanol (Groves Tank)	Horizontal	130	1,560	---	---	---	---
T-13	Oil (TXP1 ATM Slop Tank)	Horizontal	8,820	105,840	---	---	---	---
T-14	Lube Oil (TXP Residue Compressor)	Horizontal	2,000	24,000	---	---	---	---
T-15	Lube Oil (Engine Day Tank)	Horizontal	300	3,600	---	---	---	---
T-16	Lube Oil (Engine Day Tank)	Horizontal	300	3,600	---	---	---	---
T-17	Lube Oil (C-120)	Horizontal	300	3,600	---	---	---	---
T-18	Oil (60 Site)	Horizontal	2,000	24,000	---	---	---	---
T-19	Oil (TXP2/TXP3 Residue Compressors)	Horizontal	300	3,600	---	---	---	---
T-20	Heat Medium (Oil)	na	750	9,000	---	---	---	---
T-21	Heat Medium (Oil)	na	750	9,000	---	---	---	---
T-22	Heat Medium (Oil)	na	750	9,000	---	---	---	---
T-23	Lube Oil (Engine Day Tank)	Horizontal	300	3,600	---	---	---	---
T-24	Used Oil	na	100	1,200	---	---	---	---
T-25	Used Oil	na	100	1,200	---	---	---	---
TOTAL:					0.02	0.11	0.00	0.00
THRESHOLD:					1.00	5.00	0.10	0.50

***** End of Application for Title V Operating Permit (45CSR30) *****
