Williams Ohio Valley Midstream LLC
100 Teletech Drive
Moundsville, WV 26041
(304) 843-3125
(304) 843-3196 fax

June 14, 2017

Beverly McKeone, P.E.
New Source Review Program Manager
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Subject: Class II Administrative Update (R13-2826J)
Williams Ohio Valley Midstream LLC
FORT BEELER GAS PROCESSING PLANT
Cameron, Marshall County, West Virginia

Dear Ms. McKeone:

Williams Ohio Valley Midstream LLC (OVM), is submitting this Application for a Class II Administrative Update to Modify Permit R13-2826J, issued 06/16/16, for the Fort Beeler Gas Processing Plant, located approximately 3.8 miles N-NW of Cameron in Marshall County, West Virginia.

This application has been prepared and submitted to request the following updates to the facility's current air quality permit (R13-2826J, issued 06/16/16):

Increase in NOx emissions resulting from:
* Updated Emission Factors from AP-42: 13.5-1 - Flare, Dated 12/16

Decrease in VOC and HAP emissions resulting from:
* Reduction in "safety margin" (from 100% to 20%) of Gas VOC Content.

Offset by:
* Removal of Old Process Flare (FL-01)
* Increase in LDAR Component Count (from 18,470 Units to 24,550 Units).

A summary of changes to the facility-wide potential to emit are provided as an attachment to this cover letter.

(Note: The Groves triethylene glycol dehydrator and associated equipment, located adjacent to the Fort Beeler Gas Plant, are covered under a separate permit (R13-3212A, issued 06/07/17). The proposed updates to the Fort Beeler Gas Plant do not affect the Groves Dehydration Station operations or its permit.)

If you have any questions concerning this submittal or need additional information, please contact me at (304) 843-3125 or dave.morris@williams.com.

Sincerely,

Dave Morris
Environmental Specialist

Attachment:
Emissions Summary Sheet

Enclosures:
Application for Class II Administrative Update
Attachments A through S
Check for Application Fee

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

EMISSIONS SUMMARY SHEET

Facility-Wide Emissions Summary [Tons per Year]			
Criteria Pollutants	**Potential Emissions**		
	Current Permit	**Change**	**Proposed Permit**
Nitrogen Oxides (NOX)	93.40	**0.79**	**94.18**
Carbon Monoxide (CO)	93.52	(4.36)	**89.15**
Point - Volatile Organic Compounds (VOC)	108.02	**(14.41)**	**93.61**
Fugitive - Volatile Organic Compounds (VOC)	70.76	**10.17**	**80.93**
Total - Volatile Organic Compounds (VOC)	178.79	**(4.24)**	**174.54**
Sulfur Dioxide (SO2)	0.47	(0.01)	**0.46**
Particulate Matter (PM10/2.5)	7.20	(0.10)	**7.09**
Lead (Pb)	---	---	**---**
Hazardous Air Pollutants (HAP)	**Potential Emissions (Including Fugitives)**		
	Current Permit	**Change**	**Proposed Permit**
Acetaldehyde (C2H4O)	1.47	---	**1.47**
Acrolein (C3H4O)	0.92	---	**0.92**
Benzene (C6H6)	1.27	**(0.56)**	**0.70**
Ethylbenzene (C8H10)	0.86	**(0.57)**	**0.30**
Formaldehyde (HCHO)	4.54	(0.00)	**4.54**
n-Hexane (C6H14)	6.26	**(2.39)**	**3.88**
Methanol (CH4O)	0.47	---	**0.47**
Toluene (C7H8)	2.27	**(0.56)**	**1.71**
2,2,4-Trimethylpentane (C8H18)	0.54	**(0.46)**	**0.08**
Xylenes (C8H10)	5.17	**(0.57)**	**4.60**
Other HAP	0.17	**(0.12)**	**0.06**
Total HAP	23.96	**(5.22)**	**18.74**
Greenhouse Gases (GHG)	**Potential Emissions (Including Fugitives)**		
	Current Permit	**Change**	**Proposed Permit**
Carbon Dioxide (CO2)	98,769	---	**97,088**
Methane (CH4)	1,051	**(0)**	**1,051**
Nitrous Oxide (N2O)	0.2	---	**0.2**
Total - CO2 Equivalent (CO2e)	125,115	**(1,696)**	**123,419**

Increase in NOx Emissions resulting from:

* Updated Emissions Factors from AP-42: 13.5-1 - Flare, Dated 12/16.

Decrease in VOC and HAP emissions resulting from:

* Reduction in "Safety-Margin" (from 100% to 20%) of the Gas VOC/HAP Content

Offset by:

* Removal of Old Process Flare (FL-01)
* Increase in LDAR Component Count (from 18,470 Units to 24,550 Units).

APPLICATION FOR
CLASS II ADMINISTRATIVE UPDATE
(R13-2826J)

For the:

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Cameron, Marshall County, West Virginia

Submitted to:

WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY

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

June 2017

APPLICATION FOR
CLASS II ADMINISTRATIVE UPDATE
(R13-2826J)

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PLANT

Cameron, Marshall County, West Virginia

TABLE OF CONTENTS

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CLASS II ADMINISTRATIVE UPDATE
(R13-2826J)

- **SECTION I. General**
- **SECTION II. Additional Attachments and Supporting Documents**
- **SECTION III. Certification of Information**

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

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

APPLICATION FOR NSR PERMIT
AND
TITLE V PERMIT REVISION
(OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☐ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☒ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☒ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION** ☐ **NOT APPLICABLE**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
WILLIAMS OHIO VALLEY MIDSTREAM LLC (OVM)

2. Federal Employer ID No. ***(FEIN):***
27 – 0856707

3. Name of facility *(if different from above):*
FORT BEELER GAS PROCESSING PLANT (GP)

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
WILLIAMS OHIO VALLEY MIDSTREAM LLC (OVM)
PARK PLACE CORPORATE CENTER 2
2000 COMMERCE DRIVE
PITTSBURGH, PA 15275

5B. Facility's present physical address:
FORT BEELER GAS PROCESSING PLANT
0.2 MI WEST OF US HWY 250/WAYNESBURG PIKE
0.6 MI SE OF COUNTY RD 34//MIDDLE GRAVE CREEK RD
CAMERON, WV 26033

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☐ **YES** ☒ **NO**

- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: **THE WILLIAMS COMPANIES, INC**

8. Does the applicant own, lease, have an option to buy, or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: **APPLICANT OWNS/LEASES THE SITE**
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.):
NATURAL GAS PROCESSING PLANT

10. North American Industry Classification System **(NAICS)** code for the facility:
211112 - NATURAL GAS LIQUID EXTRACTION

11A. DAQ Plant ID No. (for existing facilities only):
051 – 00127

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R13-2826J - FT BEELER GAS PLANT, ISSUED 06/26/16
R30-05100127 - FT BEELER GAS PLANT, ISSUED 01/09/15
R13-3212A - GROVES DEHYDRATOR, ISSUED 06/07/17

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A. Directions to the facility

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

FROM JEFFERSON AVE IN MOUNDSVILLE:

1) HEAD EAST ON 1ST ST ~0.8MI; 2) TURN LEFT ONTO TO CONTINUE ON US-250/WAYNESBURG PIKE ~11.7 MI; 3) CONTINUE ON US-250 PAST CO RD 34/MIDDLE GRAVE CREEK RD ~0.6 MI; 4) TURN RIGHT ONTO GRAVEL ACCESS ROAD ~0.2 MI; 5) ENTRANCE TO SITE IS STRAIGHT AHEAD.

FROM MAIN ST IN CAMERON:

1) HEAD NORTH ON US-250/WAYNESBURG PIKE ~3.7MI; 2) TURN LEFT TO CONTINUE ON US-250/ WAYNESBURG PIKE ~2.5 MI; 3) TURN LEFT ONTO GRAVEL ACCESS ROAD ~0.2 MI; 4) ENTRANCE TO SITE IS STRAIGHT AHEAD.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
0.2 MI WEST OF US HWY 250/WAYNESBURG PIKE **0.6 MI SE OF COUNTY RD 34//MIDDLE GRAVE CREEK RD**	**CAMERON**	**MARSHALL**

12.E. UTM Northing (KM):	12F. UTM Easting (KM):	12G. UTM Zone:
4,414.35	**535.00**	**17S**

13. Briefly describe the proposed change(s) at the facility:

INCREASE IN NOX EMISSIONS RESULTING FROM:

- **APPLICATION OF TO UPDATED AP-42 EMISSIONS FACTOR FOR FLARES (AP-42, 13.5-1, 12/16)**

DECREASE IN VOC/HAP EMISSIONS RESULTING FROM:

- **REDUCING THE MARGIN OF SAFETY (FROM 100% TO 20%) ON THE GAS VOC/HAP CONTENT.**

OFFSET BY:

- **REMOVAL OF THE OLD PROCESS FLARE (FL-01).**
- **INCREASING THE NUMBER OF PIPING AND EQUIPMENT COMPONENTS (FROM 18,470 UNITS TO 24,280 UNITS).**

14A. Provide the date of anticipated installation or change: **na** If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: **na**	14B. Date of anticipated Start-Up if a permit is granted: **na**

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day: **24** Days Per Week: **7** Weeks Per Year: **52**

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18. **Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***).
   - Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
   - Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**
    – For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☒ **Bulk Liquid Transfer (TLO/20E)**	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks **(T-03/22E and T-04/23E)**
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify:
NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEETS (CE-01/1E thru CE-05/5E and GE-01/8E)
NATURAL GAS FIRED HEATERS/BOILERS (H-01.9E thru H-06/14E)
DEHYDRATOR AND REBOILER (DH-01/15E and BLR-01/16E)
Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☒ **Flare (FL-02/18E)**
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☒ Other Collectors, specify:
NON-SELECTIVE CATALYTIC REDUCTION (NSCR) AND OXIDATION CATALYST (OXCAT)
Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**
- Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33**. Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?
☐ **YES** ☒ **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 found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

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.

SIGNATURE _____ DATE: _____

(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: **PAUL HUNTER**		35C. Title: **GENERAL MANAGER OHIO RIVER SUPPLY HUB**
35D. E-mail: **PAULV.HUNTER@WILLIAMS.COM**	36E. Phone: **(412) 787-5561**	36F. FAX: **(412) 787-6002**
36A. Printed name of contact person (if different from above): **DAVE MORRIS**		36B. Title: **ENVIRONMENTAL SPECIALIST**
36C. E-mail: **DAVE.MORRIS@WILLIAMS.COM**	36D. Phone: **(304) 843-3125**	36E. FAX: **(304) 843-3196**

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☒ **Attachment C: Install/Startup Schedule**
- ☒ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☒ **Attachment H: Material Safety Data Sheets (MSDS)**
- ☒ **Attachment I: Emission Units Table**
- ☒ **Attachment J: Emission Points Data Summary Sheet**
- ☒ **Attachment K: Fugitive Emissions Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☒ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☐ **Attachment Q: Business Confidential Claims (Not Applicable)**
- ☐ **Attachment R: Authority Forms (Not Applicable)**
- ☒ **Attachment S: Title V Permit Revision Information**
- ☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A

Business Certificate

"6. **West Virginia Business Registration**. Provide a copy of the Certificate of Authority/Authority of L.L.C./Registration (one page) including any name change amendments or other Business Certificate as Attachment A."

- **Certificate of Amendment to the Certificate of Authority**
  From: CAIMAN EASTERN MIDSTREAM, LLC
  To: WILLIAMS OHIO VALLEY MIDSTREAM LLC
  Date: May 15, 2012

- **Certificate of Authority of a Foreign Limited Liability Company**
  To: CAIMAN EASTERN MIDSTREAM, LLC
  Date: September 11, 2009

State of West Virginia

Certificate

I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that

the attached true and exact copy of the Articles of Amendment to the Articles of Organization of

CAIMAN EASTERN MIDSTREAM, LLC

are filed in my office, signed and verified, as required by the provisions of West Virginia Code §31B-2-204 and conform to law. Therefore, I issue this

CERTIFICATE OF AMENDMENT TO THE CERTIFICATE OF AUTHORITY

changing the name of the limited liability company to

WILLIAMS OHIO VALLEY MIDSTREAM LLC

Given under my hand and the Great Seal of the State of West Virginia on this day of May 15, 2012

Natalie E Tennant

Secretary of State

State of West Virginia

Certificate

I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that

CAIMAN EASTERN MIDSTREAM, LLC

Control Number: 99GIS

a limited liability company, organized under the laws of the State of Texas

has filed its "Application for Certificate of Authority" in my office according to the provisions of West Virginia Code §31B-10-1002. I hereby declare the organization to be registered as a foreign limited liability company from its effective date of September 11, 2009, until a certificate of cancellation is filed with our office.

Therefore, I hereby issue this

CERTIFICATE OF AUTHORITY OF A FOREIGN LIMITED LIABILITY COMPANY

to the limited liability company authorizing it to transact business in West Virginia

Given under my hand and the Great Seal of the State of West Virginia on this day of September 11, 2009

Natalie E. Tennant

Secretary of State

ATTACHMENT B

Map(s)

"12A. For **Modifications, Administrative Updates** or **Temporary** permits at an existing facility, please provide directions to the present location of the facility from the nearest state road. Include a MAP as Attachment B."

- **Location:**
  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:**
  4,414.313 km Northing x 535.00 km Easting x Zone 17S

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

- **Directions:**
  From Main St in **Cameron**:

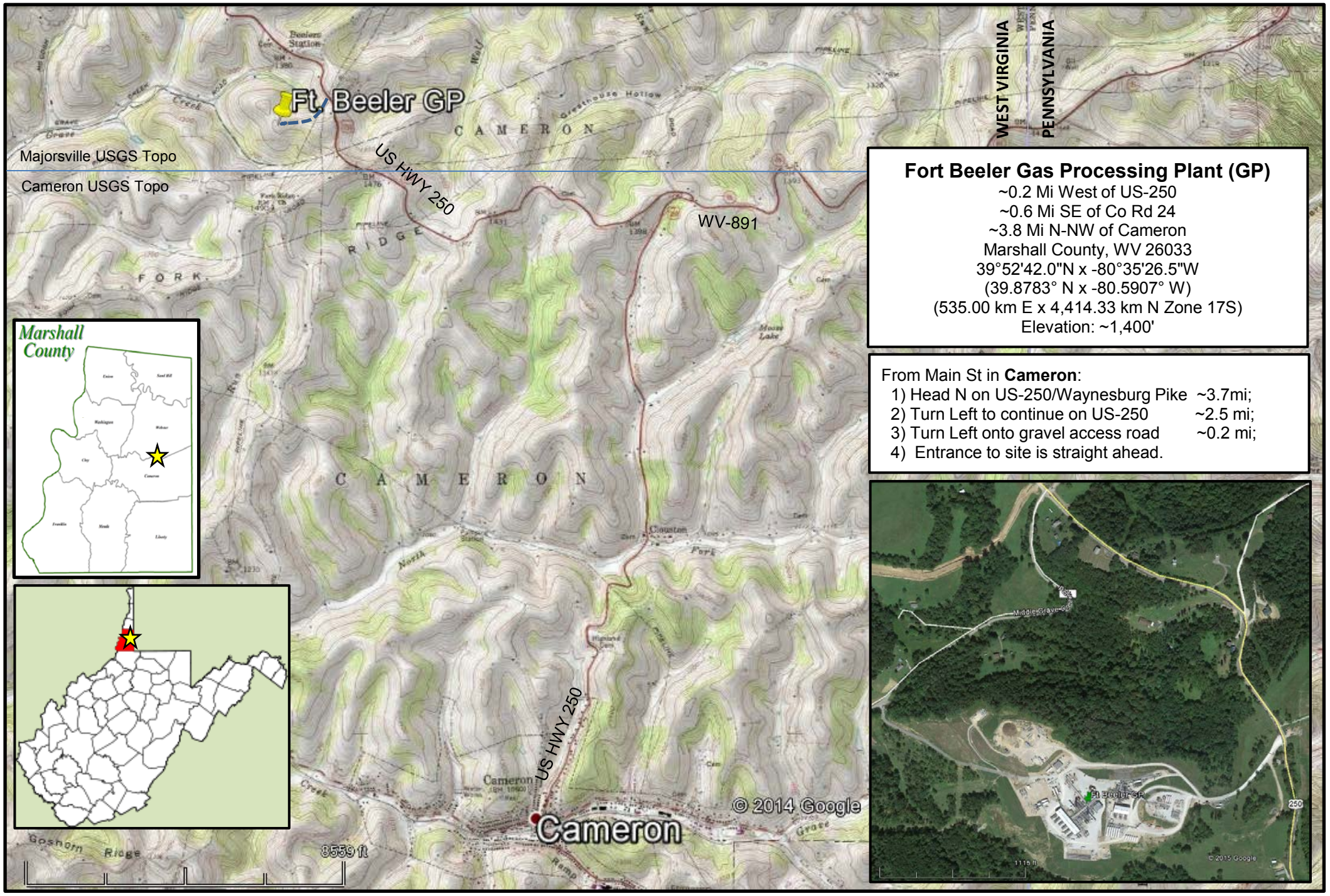
1) Head N on US-250/Waynesburg Pike	~3.7mi;
2) Turn Left to continue on US-250	~2.5 mi;
3) Turn Left onto gravel access road	~0.2 mi;
4) Entrance to site is straight ahead.	

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment B - Area (Topographic) Map



Fort Beeler Gas Processing Plant (GP)
~0.2 Mi West of US-250
~0.6 Mi SE of Co Rd 24
~3.8 Mi N-NW of Cameron
Marshall County, WV 26033
39°52'42.0"N x -80°35'26.5"W
(39.8783° N x -80.5907° W)
(535.00 km E x 4,414.33 km N Zone 17S)
Elevation: ~1,400'

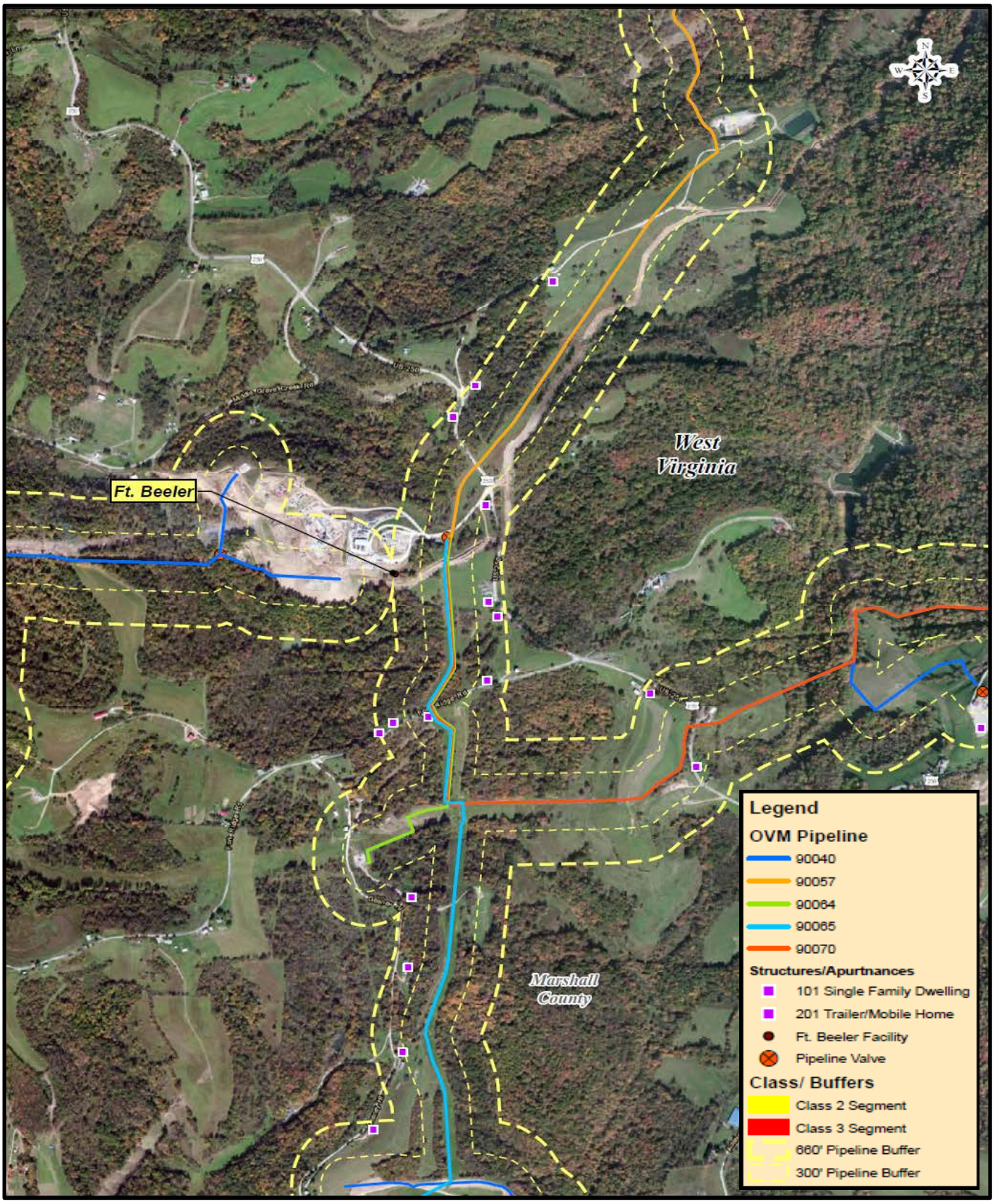
From Main St in **Cameron**:
1) Head N on US-250/Waynesburg Pike ~3.7mi;
2) Turn Left to continue on US-250 ~2.5 mi;
3) Turn Left onto gravel access road ~0.2 mi;
4) Entrance to site is straight ahead.

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment B' - Pipeline Map



ATTACHMENT C

Installation and Start-Up Schedule

"14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as Attachment C."

The OVM Fort Beeler Gas Plant is an existing operation. This Class II Administrative Update does not request any facility modifications to be implemented.

ATTACHMENT D

Regulatory Discussion

"18. **Regulatory Discussion**. List all Federal and State air pollution control regulations that you believe are applicable to the proposed process (if known). Discuss applicability and proposed demonstration(s) of compliance (if known). Provide this information as Attachment D."

- **Regulatory Discussion**
  - A. Applicability of New Source Review (NSR) Regulations
  - B. Applicability of Federal Regulations
  - C. Applicability of Source Aggregation
  - D. Applicability of State Regulations

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PLANT

Class II Administrative Update (R13-2826J)

Attachment D

REGULATORY DISCUSSION

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 facility has been determined as follows:

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

This rule does not apply. The facility is a "PSD Natural 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 Controlled PTE < 250 tpy
- VOC: PSD Synthetic Minor Source with Controlled PTE < 250 tpy
- SO2: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy
- PM10/2.5: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy
- CO2e: Not Applicable - Facility is NOT PSD Major for any other pollutant

2. Nonattainment New Source Review (NNSR) [Not Applicable]

This rule does not apply. The facility is in a county that is classified as Non-Attainment for Sulfur Dioxide (SO2) and as Attainment/Unclassified/Maintenance for all other criteria pollutants. (As of 10/01/15, see - http://www3.epa.gov/airquality/greenbook/ancl.html.) With the requested Federally Enforceable Limits (FEL) the facility qualifies as an "NNSR Minor Source" as follows:

- SO2: NNSR Natural Minor Source with Pre-Controlled PTE < 100 tpy

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

This rule does not apply. With the requested Federally Enforceable Limits (FEL), the facility qualifies as a "HAP Area Source" as follows:

- Each HAP: HAP Area Source with Controlled Formaldehyde (HCHO) PTE < 10 tpy
- Total HAPs: HAP Area Source with Controlled Total of All HAPs PTE < 25 tpy

4. Title V Operating Permit [Applicable]

This rule does apply. With the requested Federally Enforceable Limits (FEL), the facility is subject to "Title V Operating Permit" requirements as follows:

- VOC: Controlled PTE > 100 tpy
- CO2e: 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 A, General Provisions

40CFR§60.1-§60.16 [Applicable]

This rule does apply to Heaters (H-01/9E, H-05/13E and H-06/14E), Compressors (RPC/7E), Engine (GE-01/8E), and Fugitives (FUG/21E) because they are each subject to various NSPS requirements.

2. NSPS Dc, Steam Generating Units

40CFR§60.40c-§60.48c [Applicable]

This rule does apply to the 10.0 MMBtu/hr Hot Oil Heater and 21.22 MMBtu/hr Heat Medium Heaters (H-01/9E, H-05/13E and H-06/14E) 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)).

3. NSPS Kb, Volatile Organic Liquid Storage Vessels

40CFR§60.110b-§60.117b [Not Applicable]

This rule does not apply because each tank either has a design capacity < 75 m3 (19,813 gal, 472 bbl) (§60.110b(a)) and/or has a design capacity less than 1,589.874 m3 (420,000 gal, 10,000 bbl) and the liquids are stored prior to custody transfer (§60.110b(d)(4).

4. 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).

5. NSPS KKK, Leaks from Natural Gas Processing Plants

40CFR§60.630-§60.636 [Applicable]

This rule does apply because the facility is a natural gas processing plant (FUG/21E) 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).

6. 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)).

7. 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)).

8. 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 Caterpillar G3612LE compressor engines (CE-03 thru CE-05) because they are lean burn with bhp ≥ 1,350 and were manufactured before 07/01/07 (§60.4230(a)(4)(i)).

This rule does apply to the 118 bhp Olympian G70LG Emergency Generator Engine (GE-01/8E). Compliance is achieved by purchasing an EPA Certified Engine and operating the engine in accordance with the manufacturer's emission-related written instructions.

This rule does not apply to the 225 bhp Caterpillar G342NA (CE-01/1E) or 625 bhp Caterpillar G398TA (CE-02/2E) engines because they each commenced construction before June 12, 2006 (§60.4230(a)(5)).

9. 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).

10. NSPS OOOO, Crude Oil and Natural Gas Production

40CFR§60.5360-§60.5430 [Applicable]

This rule does apply to the electric motor driven Columbia gas compressor (CM-01) because it was constructed after 08/23/11 (§60.5360 and §60.5365(c)). Requirements include replacing rod packing systems on a specified schedule (§60.5385(a)) and notification, monitoring, recordkeeping and reporting (§60.5410(c), §60.5415(c), §60.5420(b)(1) and §60.5420(b)(4)).

This rule does apply to the produced water tanks (T-03/22E and T-04/23E) because they are located in the oil and natural gas production segment and were constructed after 08/23/11 (§60.5360 and §60.5365(e)). However, because the tanks do not have the potential to emit VOC ≥ 6 tpy there are no emission standard, or emission control (§60.5395), notification, monitoring or reporting requirements. 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 are specified in §60.5400.

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

11. NESHAP A, General Provisions

40CFR§63.1-§63.16 [Applicable]

This rule does apply to the Dehydrator (DH-01/15E) and natural gas-fired compressor engines (CE-01/01 thru CE-05/5E) because they are subject to NESHAP Subpart HH and NESHAP ZZZZ respectively.

12. NESHAP HH, Oil and Natural Gas Production Facilities

40CFR§63.760-§63.779 [Applicable]

This rule does apply to the Groves 5.0 MMscfd TEG Dehydrator (DH-01/15E); however, this unit is permitted separately under R13-3212A, issued 06/07/17. This unit is not affected by this application for modification permit.

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.

13. 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)).

14. NESHAP YYYY, Stationary Combustion Turbines

40CFR§63.6080-§63.6175 [Not Applicable]

This rule does not apply because there is no stationary combustion turbine at the facility (§68.6080).

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

40CFR§63.6580-§63.6675 [Applicable]

This rule does apply to all of the natural gas-fired compressor engines (CE-01/01 thru CE-05/5E).

This rule does apply to the 225 bhp Caterpillar G342NA (4SRB) engine (CE-01/1E) because it is an “existing engine”; i.e., commenced construction before 06/12/06 (§63.6590(a)(1)(iii)). Compliance is required no later than 10/19/13 (§63.6595(a)).

Because it is an existing, non-emergency, rich burn, remote stationary RICE ≤ 500 hp, 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 (4SRB) engine (CE-02/2E) because it is an “existing engine”; i.e., commenced construction before 06/12/06 (§63.6590(a)(1)(iii)). Compliance is required no later than 10/19/13 (§63.6595(a)).

Because it is an existing, non-emergency, rich burn, remote stationary RICE > 500 hp, 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 hp, 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 118 bhp Olympian G70LG emergency generator engine (GE-01/8E) 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 defines various class locations and 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.

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

40CFR§63.7480 – §63.7575 [Not Applicable]

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

17. NESHAP JJJJJJ, 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)).

18. Chemical Accident Prevention Provisions

40CFR§68.1-§68.220 [Applicable]

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

19. Compliance Assurance Monitoring (CAM)

40CFR§64.1-§64.10 [Not Applicable]

This rule does not apply. Although there are pollutant specific emission units subject to an emissions limitation and a control device is used to achieve compliance, the potential pre-control emissions do not exceed 100 tpy.

20. Mandatory Greenhouse Gases (GHG) Reporting

40CFR§98.1-§98.9 [Potentially Applicable]

This rule potentially applies because the facility has the PTE ≥ 25,000 metric ton (MT) (27,558 ton) per year of Carbon Dioxide Equivalent (CO2e) emissions.

The actual GHG emissions will be reported if CO2e emissions from stationary combustion sources exceed the 25,000 MT per year threshold (§98.2(a)).

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 is whether the activities:

i) Belong to the same industrial grouping; and
ii) Are located on one or more contiguous or adjacent properties; 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

The determination of whether two or more facilities are “contiguous” or “adjacent” is made on a case-by-case basis. This determination is proximity based, and it is important to focus on this criterion and whether two contiguous or adjacent facilities, considered as a single source, meet 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.” 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 in Indirect Heat Exchangers**
   45CSR2 [Applicable]

The rule does apply to the gas-fueled heaters (9E-14E); limiting opacity to 10% based on a six minute block average.

Any fuel burning unit with a heat input ≥ 10 MMBtu/hr (9E, 13E and 14E) 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 the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors**
   45CSR4 [Applicable]

The 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]

The 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 from the Emission of Sulfur Oxides**
   45CSR10 [Applicable]

The rule does apply to the gas-fueled heaters (9E-14E); in-stack sulfur dioxide concentration to 2,000 parts per million by volume.

Any fuel burning unit with a heat input ≥ 10 MMBtu/hr (9E, 13E and 14E) is also subject to Sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting).

5. **Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation**
   45CSR13 [Applicable]

The rule does apply as Williams is seeking a NSR Modification Permit to an existing permit. Williams has published the required Class I legal advertisement notifying the public of their permit application, and paid the appropriate application fee (modification).

6. **Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants**
   45CSR14 [Not Applicable]

The rule does not apply because the proposed changes do not trigger major modification thresholds.

7. **Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60**
   45CSR16 [Applicable]

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

8. **Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment**
   45CSR19 [Not Applicable]

The rule does not apply. Facility-wide emissions are below the nonattainment New Source Review thresholds of 100 TPY SO2 emissions.

9. **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.

10. Prevent and Control Emissions of Toxic Air Pollutants
45CSR27 [Not Applicable]

This rule does not apply because equipment 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).

11. 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.

12. Emission Statements for VOC and NOX
45CSR29 [Not Applicable]

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

13. Requirements for Operating Permits
45CSR30 [Applicable]

This rule does apply as the facility is a major source of VOC and CO2e pollutants.

14. Emission Standards for Hazardous Air Pollutants (HAP)
45CSR34 [Not Applicable]

This rule does not apply because the provisions under Subpart HH of 40 CFR Part 63 which apply to non-major area sources of hazardous air pollutants are excluded.

ATTACHMENT E

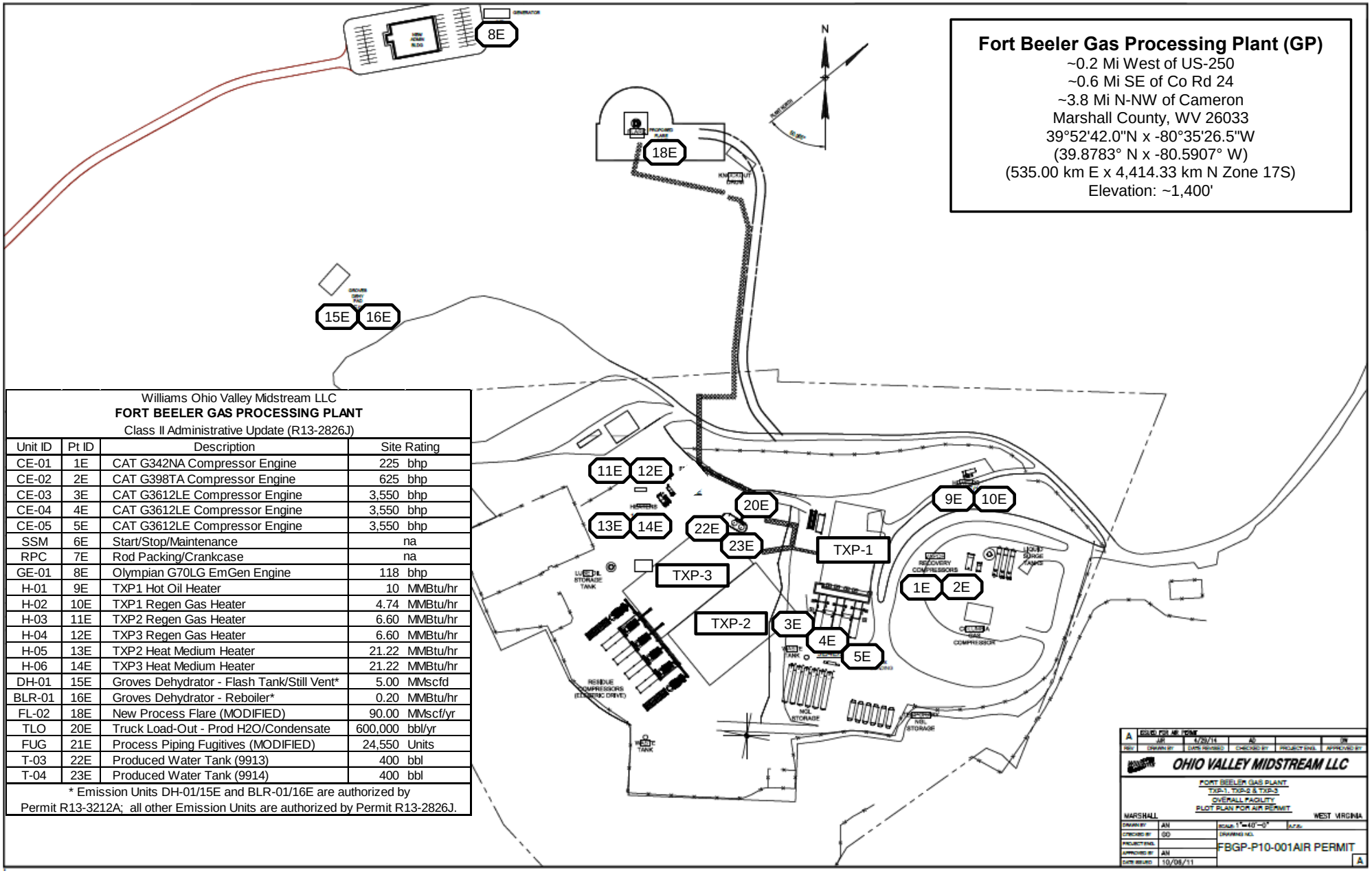
Plot Plan

"21. Provide a **Plot Plan**, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as Attachment E."

- Plot Plan – Fort Beeler Gas Plant

Attachment E - Plot Plan

Fort Beeler Gas Processing Plant (GP)
~0.2 Mi West of US-250
~0.6 Mi SE of Co Rd 24
~3.8 Mi N-NW of Cameron
Marshall County, WV 26033
39°52'42.0"N x -80°35'26.5"W
(39.8783° N x -80.5907° W)
(535.00 km E x 4,414.33 km N Zone 17S)
Elevation: ~1,400'

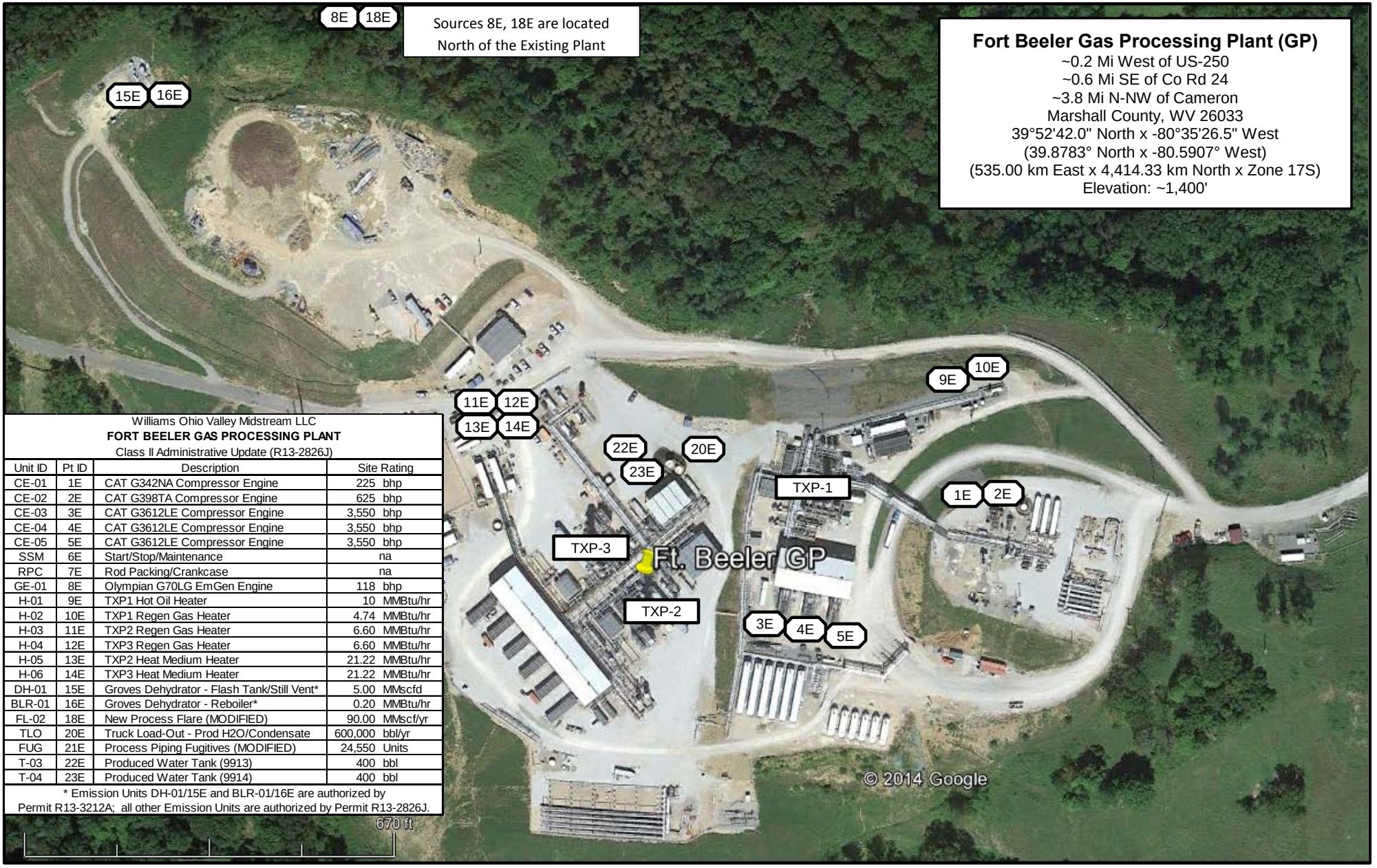


Williams Ohio Valley Midstream LLC
FORT BEELER GAS PROCESSING PLANT
Class II Administrative Update (R13-2826J)

Unit ID	Pt ID	Description	Site Rating
CE-01	1E	CAT G342NA Compressor Engine	225 bhp
CE-02	2E	CAT G398TA Compressor Engine	625 bhp
CE-03	3E	CAT G3612LE Compressor Engine	3,550 bhp
CE-04	4E	CAT G3612LE Compressor Engine	3,550 bhp
CE-05	5E	CAT G3612LE Compressor Engine	3,550 bhp
SSM	6E	Start/Stop/Maintenance	na
RPC	7E	Rod Packing/Crankcase	na
GE-01	8E	Olympian G70LG EmGen Engine	118 bhp
H-01	9E	TXP1 Hot Oil Heater	10 MMBtu/hr
H-02	10E	TXP1 Regen Gas Heater	4.74 MMBtu/hr
H-03	11E	TXP2 Regen Gas Heater	6.60 MMBtu/hr
H-04	12E	TXP3 Regen Gas Heater	6.60 MMBtu/hr
H-05	13E	TXP2 Heat Medium Heater	21.22 MMBtu/hr
H-06	14E	TXP3 Heat Medium Heater	21.22 MMBtu/hr
DH-01	15E	Groves Dehydrator - Flash Tank/Still Vent*	5.00 MMscfd
BLR-01	16E	Groves Dehydrator - Reboiler*	0.20 MMBtu/hr
FL-02	18E	New Process Flare (MODIFIED)	90.00 MMscf/yr
TLO	20E	Truck Load-Out - Prod H2O/Condensate	600,000 bbl/yr
FUG	21E	Process Piping Fugitives (MODIFIED)	24,550 Units
T-03	22E	Produced Water Tank (9913)	400 bbl
T-04	23E	Produced Water Tank (9914)	400 bbl

* Emission Units DH-01/15E and BLR-01/16E are authorized by Permit R13-3212A; all other Emission Units are authorized by Permit R13-2826J.

Attachment E' - Aerial View



Williams Ohio Valley Midstream LLC
FORT BEELER GAS PROCESSING PLANT
Class II Administrative Update (R13-2826J)

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CE-01	1E	CAT G342NA Compressor Engine	225 bhp
CE-02	2E	CAT G398TA Compressor Engine	625 bhp
CE-03	3E	CAT G3612LE Compressor Engine	3,550 bhp
CE-04	4E	CAT G3612LE Compressor Engine	3,550 bhp
CE-05	5E	CAT G3612LE Compressor Engine	3,550 bhp
SSM	6E	Start/Stop/Maintenance	na
RPC	7E	Rod Packing/Crankcase	na
GE-01	8E	Olympian G70LG EmGen Engine	118 bhp
H-01	9E	TXP1 Hot Oil Heater	10 MMBtu/hr
H-02	10E	TXP1 Regen Gas Heater	4.74 MMBtu/hr
H-03	11E	TXP2 Regen Gas Heater	6.60 MMBtu/hr
H-04	12E	TXP3 Regen Gas Heater	6.60 MMBtu/hr
H-05	13E	TXP2 Heat Medium Heater	21.22 MMBtu/hr
H-06	14E	TXP3 Heat Medium Heater	21.22 MMBtu/hr
DH-01	15E	Groves Dehydrator - Flash Tank/Still Vent*	5.00 MMscfd
BLR-01	16E	Groves Dehydrator - Reboiler*	0.20 MMBtu/hr
FL-02	18E	New Process Flare (MODIFIED)	90.00 MMscf/yr
TLO	20E	Truck Load-Out - Prod H2O/Condensate	600,000 bbl/yr
FUG	21E	Process Piping Fugitives (MODIFIED)	24,550 Units
T-03	22E	Produced Water Tank (9913)	400 bbl
T-04	23E	Produced Water Tank (9914)	400 bbl

* Emission Units DH-01/15E and BLR-01/16E are authorized by Permit R13-3212A; all other Emission Units are authorized by Permit R13-2826J.

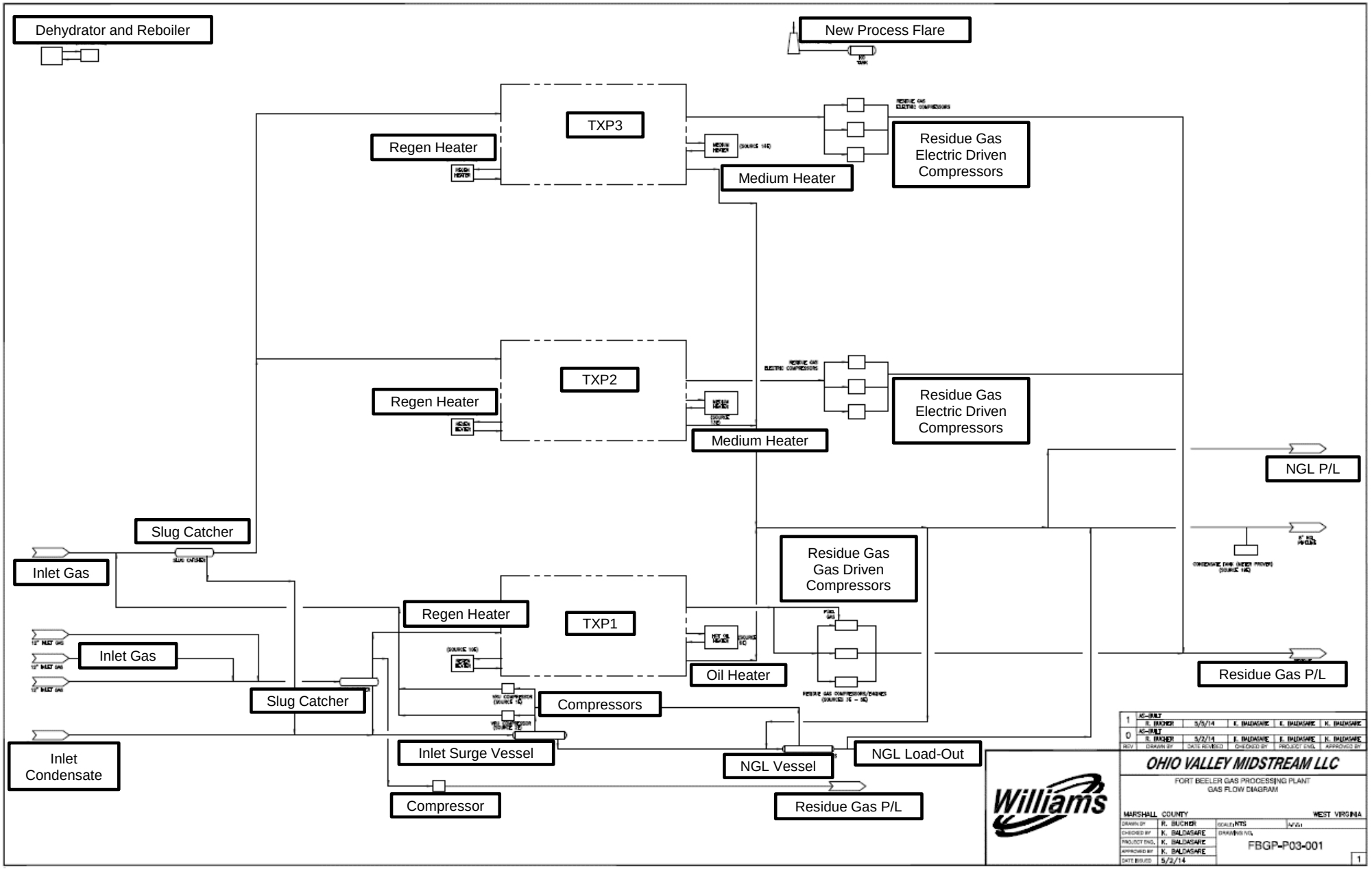
ATTACHMENT F

Detailed Process Flow Diagram(s) (PFD)

"22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as Attachment F."

- Process Flow Diagram (PFD) – Fort Beeler Gas Plant

Attachment F - Process Flow Diagram (PFD)



ATTACHMENT G

Process Description

"23. Provide **a Process Description** as Attachment G. Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable). "

- **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 Flare (FL-02 (18E))

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

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

ATTACHMENT G
Process Description

Williams Ohio Valley Midstream LLC (OVM)
FORT BEELER GAS PROCESSING PLANT (GP)
Class II Administrative Update (R13-2826J)

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 R13-2826J. The facility has the capacity to process 520 MMscfd of raw natural gas through one (1) 120 MMscfd cryogenic turbo-expansion plant (TXP1) and two (2) 200 MMscfd cryogenic turbo-expansion plants (TXP2 and TXP3).

This Application for Class II Administrative Update (R13-2826J) has been prepared and submitted to accomplish the following objectives:

Increase in NOx emissions resulting from:
* Updated Emissions Factors from AP-42: 13.5-1 - Flare, Dated 12/16

Decrease in VOC and HAP emissions resulting from:
* Reduction in "safety margin" (from 100% to 20%) of Gas VOC Content.

Offset by:
* Removal of Old Process Flare (FL-01)
* Increase in LDAR Component Count (from 18,470 Units to 24,280 Units).

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.

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-01/1E and CE-02/2E) utilize non-selective catalytic reduction (NSCR) and the lean-burn engines (CE-03/3E thru CE-05/5E) utilize catalytic oxidation (OxCat).

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

Start/Stop/Maintenance (SSM/6E) 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 New Process Flare (FL-02/18E).

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

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

F. Emergency Generator Engine (GE-01/8E)

One (1) emergency generator engine is 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-02/10E thru H-04/12E) are used to regenerate the mole-sieves necessary to further dry the inlet gas and the hot oil heater (H-01/9E) and heat medium heaters (H-05/13E and H-06/14E) 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 Flare (FL-02/18E)

One process flare is used at the facility to safely combust natural gas and NGL during routine operation. The new process flare (FL-02/18E) is used to combust natural gas and NGL released from numerous sources and it is estimated up to 90.0 MMscf/yr is combusted over the course of a year. During normal operating conditions, gas sent to the new flare (FL-02/17E) is associated with maintenance activities. The top five non-emergency streams routed to the vents to the new process flare (FL-02/18E) 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 (F-441). The new process flare (FL-02/18E) will also be used to combust natural gas released during general maintenance activities (e.g., blowdowns of the six electrically driven residue gas compressors) and also emissions in the event of an upset.

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

There are emissions from the truck loading of produced water/oil (TLO/20E). Loading of NGLs is 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-03/22E and T-04/23E). 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.

ATTACHMENT H

Material Safety Data Sheets (MSDS)
(And Representative Gas Analysis)

"24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as Attachment H. For chemical processes, provide a MSDS for each compound emitted to the air."

- **STREAM COMPOSITION**
  - Inlet Natural Gas Composition
  - Residue Natural Gas Composition
  - Natural Gas Liquids (NGL) Composition
  - Extended Gas Analysis Summary
  - Dehydrator Inlet Gas Composition
  - Dehydrator Extended Gas Analysis
  - Waste Gas Composition - New Process Flare
  - Btu Analysis - New Process Flare
- **MATERIAL SAFETY DATA SHEETS (MSDS):**
  - Wellhead Natural Gas
  - Residue Natural Gas
  - Natural Gas Liquids (NGL)
  - Natural Gasoline
  - Condensate
  - Triethylene Glycol (TEG)
  - Lube Oil

(AVAILABLE UPON REQUEST)

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment H - MSDS and Lab Analysis

Inlet Gas Composition

Sample Date: **11/01/13** **(More recent analysis are less "rich")** http://www.chemindustry.com/apps/chemicals

Compound	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fract (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**	0.734463	11.7826	54.8851	31,049.14
Ethane*	74-84-0	C2H6	30.069	**17.2512**	0.172517	5.1874	24.1638	13,669.71
Propane**	74-98-6	C3H8	44.096	**6.0946**	0.060948	2.6875	12.5189	7,082.09
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	1,996.67
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	**0.0001**	0.000001	0.0001	0.0005	0.28
Xylenes***	1330-20-7	C8H10	106.165	**0.0001**	0.000001	0.0001	0.0005	0.28
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	**0.0001**	0.000001	0.0001	0.0005	0.30
Totals:				**100.00**	**1.0000**	**21.4677**	**100.00**	**56,571.12**
THC:				**99.31**	**0.9932**	**21.2459**	**98.97**	**55,986.49**
Total VOC:				**8.62**	**0.0862**	**4.2759**	**19.92**	**11,267.63**
Total HAP:				**0.05**	**0.0005**	**0.0468**	**0.22**	**123.30**

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

#UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 ^{o}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			20% Safetry Margin Assumed "Worst-Case" Parameters		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	0.189	0.387	218.85	0.226	0.464	**262.62**
Methane	75-82-8	CH4	73.444	54.885	31,049.14	88.133	75.000	**37,258.97**
Ethane	74-84-0	CH5	17.251	24.164	13,669.71	---	---	**---**
VOC (Propane)	74-98-6	C3H8	8.618	19.918	11,267.63	10.341	23.901	**13,521.16**
n-Hexane	110-54-3	C6H14	0.0518	0.2079	117.63	0.0622	0.2495	**141.16**
Benzene	71-43-2	C6H6	0.0008	0.0029	1.65	0.0010	0.0035	**1.98**
Toluene	108-88-3	C7H8	0.0013	0.0056	3.16	0.0016	0.0067	**3.79**
Ethylbenzene	100-41-4	C8H10	0.0001	0.0005	0.28	0.0001	0.0006	**0.34**
Xylenes	1330-20-7	C8H10	0.0001	0.0005	0.28	0.0001	0.0006	**0.34**
2,2,4-Trimethylpentane	540-84-1	C8H18	0.0001	0.0005	0.30	0.0001	0.0006	**0.36**
Total HAP:	Various	C6 thru C8	0.0542	0.2180	123.30	0.0650	0.2615	**147.96**

98.8308

Inlet Gas Lab Analysis

Legacy Measurement Solutions Gooc
Shreveport, LA
318-226-7237

Customer	: 2259 - WILLIAMS	**Date Sampled**	: 11/01/2013
Station ID	: 5001	**Date Analyzed**	: 11/11/2013
Cylinder ID	: 5203	**Effective Date**	: 12/01/2013
Producer	:	**Cyl Pressure**	: 900
Lease	: FORT BEELER 12 INCH	**Temp**	: 60
Area	: 500 - OHIO VALLEY MID	**Cylinder Type**	: Spot
State	: WV	**Sample By**	: JM

COMPONENT	MOL%	GPM@14.73(PSIA)
Oxygen	0.0030	0.000
Nitrogen	0.4955	0.000
Methane	73.4443	0.000
Carbon-Dioxide	0.1887	0.000
Ethane	17.2512	4.630
Propane	6.0946	1.685
Iso-Butane	0.5849	0.192
Normal-Butane	1.3036	0.412
Iso-Pentane	0.2148	0.079
Normal-Pentane	0.2357	0.086
2,2-Dimethylbutane	0.0045	0.002
2,3-Dimethylbutane/CycloC5	0.0087	0.003
2-methylpentane	0.0393	0.016
3-methylpentane	0.0225	0.009
Normal-Hexane	0.0518	0.021
2,2-Dimethylpentane	0.0004	0.000
Methylcyclopentane	0.0062	0.002
BENZENE	0.0008	0.000
3,3-Dimethylpentane	0.0006	0.000
CYCLOHEXANE	0.0050	0.002
2-Methylhexane	0.0075	0.003
2,3-Dimethylpentane	0.0019	0.001
3-Methylhexane	0.0075	0.003
1,t2-DMCYC5 / 2,2,4-TMC5	0.0001	0.000
1,t3-Dimethylcyclopentane	0.0002	0.000
N-Heptane	0.0108	0.005
METHYLCYCLOHEXANE	0.0059	0.003
2,5-Dimethylhexane	0.0005	0.000
2,3-Dimethylhexane	0.0007	0.000
TOLUENE	0.0013	0.000
2-Methylheptane	0.0017	0.001
4-Methylheptane	0.0007	0.000
3-Methylheptane	0.0014	0.001
1,t4-Dimethylcyclohexane	0.0007	0.000
N-OCTANE / 1,T2-DMCYC6	0.0022	0.001
1,t3-DMCYC6/1,C4-DMCYC6/1,C2,C3-TMCYC5	0.0000	0.000
2,4,4 TMC6	0.0000	0.000

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment H - MSDS and Lab Analysis

Residue Gas Composition

Sample Date: 2012

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

Compound	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fract (M%/Sum-M%)	Weighted Sum (MW*MF)	Weight % (WS/Sum-WS)	lb/MMscf (WS/UGC#)
Nitrogen	7727-37-9	N2	28.013	0.4052	0.004052	0.1135	0.6200	299.10
Hydrogen Sulfide	2148-87-8	H2S	34.086	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	0.1754	0.001754	0.0772	0.4216	203.37
Methane*	75-82-8	CH4	16.042	84.6798	0.846798	13.5847	74.2120	35,798.08
Ethane*	74-84-0	C2H6	30.069	14.0913	0.140913	4.2371	23.1470	11,165.57
Propane**	74-98-6	C3H8	44.096	0.6174	0.006174	0.2722	1.4873	717.42
i-Butane**	75-28-5	C4H10	58.122	0.0100	0.000100	0.0058	0.0318	15.32
n-Butane**	106-97-8	C4H10	58.122	0.0112	0.000112	0.0065	0.0357	17.23
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	---	---	---	---	---
Methylcyclohexane**	varies	C7H14	98.186	---	---	---	---	---
Heptanes**	varies	C7H16	100.202	---	---	---	---	---
C8+ Heavies**	varies	C8+	114.229	---	---	---	---	---
n-Hexane***	110-54-3	C6H14	86.175	0.0076	0.000076	0.0066	0.0359	17.34
Benzene***	71-43-2	C6H6	78.112	0.0001	0.000001	0.0001	0.0004	0.21
Toluene***	108-88-3	C7H8	92.138	0.0001	0.000001	0.0001	0.0005	0.24
Ethylbenzene***	100-41-4	C8H10	106.165	0.0001	0.000001	0.0001	0.0006	0.28
Xylenes***	1330-20-7	C8H10	106.165	0.0001	0.000001	0.0001	0.0006	0.28
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	0.0001	0.000001	0.0001	0.0006	0.30
Totals:				**100.00**	**1.0000**	**18.3053**	**100.00**	**48,237.61**
THC:				**99.42**	**0.9942**	**18.1146**	**98.96**	**47,735.14**
Total VOC:				**0.65**	**0.0065**	**0.2928**	**1.60**	**771.50**
Total HAP:				**0.01**	**0.0001**	**0.0071**	**0.04**	**18.65**

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

#UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 ^{o}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			20% Safetry Margin Assumed "Worst-Case" Parameters		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	0.175	0.422	203.37	0.210	0.506	**244.04**
Methane	75-82-8	CH4	84.680	74.212	35,798.08	100.000	100.000	**42,275.00**
Ethane	74-84-0	C2H6	14.091	23.147	11,165.57	---	---	**---**
VOC (Propane)	74-98-6	C3H8	0.648	1.599	771.50	0.778	1.919	**925.80**
n-Hexane	110-54-3	C6H14	0.0076	0.0359	17.34	0.0092	0.0431	**20.81**
Benzene	71-43-2	C6H6	0.0001	0.0004	0.21	0.0001	0.0005	**0.25**
Toluene	108-88-3	C7H8	0.0001	0.0005	0.24	0.0001	0.0006	**0.29**
Ethylbenzene	100-41-4	C8H10	0.0001	0.0006	0.28	0.0001	0.0007	**0.34**
Xylenes	1330-20-7	C8H10	0.0001	0.0006	0.28	0.0001	0.0007	**0.34**
2,2,4-Trimethylpentane	540-84-1	C8H18	0.0001	0.0006	0.30	0.0001	0.0007	**0.36**
Total HAP:	Various	C6 thru C8	0.0081	0.0387	18.65	0.0098	0.0464	**22.38**

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment H - MSDS and Lab Analysis

Natural Gas Liquid (NGL) Composition

Sample Date: 04/16/17

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	24.7852	0.247852	3.9762	9.5118	10,477.85
Ethane*	74-84-0	C2H6	30.069	23.7642	0.237642	7.1457	17.0939	18,830.05
Propane**	74-98-6	C3H8	44.096	20.4126	0.204126	9.0011	21.5324	23,719.34
i-Butane**	75-28-5	C4H10	58.122	4.4718	0.044718	2.5991	6.2176	6,849.10
n-Butane**	106-97-8	C4H10	58.122	11.2799	0.112799	6.5561	15.6836	17,276.51
Cyclopentane**	287-92-3	C5H10	70.100	1.3108	0.013108	0.9189	2.1981	2,421.39
i-Pentane**	78-78-4	C5H12	72.149	3.9094	0.039094	2.8206	6.7474	7,432.72
n-Pentane**	109-66-0	C5H12	72.149	4.2504	0.042504	3.0666	7.3360	8,081.05
Cyclohexane**	110-82-7	C6H12	84.159	0.2052	0.002052	0.1727	0.4132	455.13
Other Hexanes**	varies	C6H14	86.175	0.7411	0.007411	0.6387	1.5279	1,683.04
Methylcyclohexane**	varies	C7H14	98.186	0.3495	0.003495	0.3432	0.8209	904.28
Heptanes**	varies	C7H16	100.202	1.3162	0.013162	1.3189	3.1550	3,475.44
C8+ Heavies**	varies	C8+	114.229	1.6814	0.016814	1.9207	4.5946	5061.25
n-Hexane***	110-54-3	C6H14	86.175	1.4018	0.014018	1.2080	2.8899	3,183.41
Benzene***	71-43-2	C6H6	78.112	0.0231	0.000231	0.0181	0.0433	47.65
Toluene***	108-88-3	C7H8	92.138	0.0579	0.000579	0.0533	0.1275	140.50
Ethylbenzene***	100-41-4	C8H10	106.165	0.0015	0.000015	0.0016	0.0039	4.33
Xylenes***	1330-20-7	C8H10	106.165	0.0023	0.000023	0.0025	0.0059	6.48
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	0.0355	0.000355	0.0405	0.0970	106.83
			Totals:	**100.00**	**1.0000**	**41.8023**	**100.00**	**110,156.34**
Hexane+ =	**7.1265 M%**		**THC:**	**100.00**	**1.0000**	**41.8023**	**100.00**	**110,156.34**
			Total VOC:	**51.45**	**0.5145**	**30.6805**	**73.39**	**80,848.43**
			Total HAP:	**1.52**	**0.0152**	**1.3241**	**3.17**	**3,489.19**

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

#UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 ^{o}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			20% Safetry Margin Assumed "Worst-Case" Parameters		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	---	---	---	---	---	---
Methane	75-82-8	CH4	24.785	9.512	10,477.85	29.7422	11.4142	**12,573.42**
Ethane	74-84-0	CH5	23.764	17.094	18,830.05	---	---	---
VOC (Propane)	74-98-6	C3H8	51.451	73.394	80,848.43	100.000	100.000	**97,018.12**
n-Hexane	110-54-3	C6H14	1.4018	2.8899	3,183.41	1.6822	3.4679	**3,820.09**
Benzene	71-43-2	C6H6	0.0231	0.0433	47.65	0.0278	0.0519	**57.17**
Toluene	108-88-3	C7H8	0.0579	0.1275	140.50	0.0694	0.1531	**168.60**
Ethylbenzene	100-41-4	C8H10	0.0015	0.0039	4.33	0.0019	0.0047	**5.19**
Xylenes	1330-20-7	C8H10	0.0023	0.0059	6.48	0.0028	0.0071	**7.78**
2,2,4-Trimethylpentane	540-84-1	C8H18	0.0355	0.0970	106.83	0.0426	0.1164	**128.19**
Total HAP	Various	C6 thru C8	1.5222	3.1675	3,489.19	1.8267	3.8010	**4,187.03**

133.3956

NGL Lab Analysis

Williams Quality Control Facility
Extended Analysis by GPA 2186

Sample Information

	Sample Information
Sample Name	FT BEELER PIG LIQUIDS OMNI 040617 1100
Station #	52154-55
County	Marshall
State	WV
Sample Date & Time	04/06/17 1100
Sampled By	G. Stickler
Sample Type	Spot
Pressure, psig	859.0
Temp., deg. F	50.8
Cylinder #	96500
Technician	R Dibble
Calibration Name	GPA 2186
Injection Date	2017-04-06 12:47:21
Report Date	2017-04-06 13:50:35
EZReporter Configuration File	Williams - ORSH Liquid Custody Samples - May 2015.cfgx

Component Results

Component Name	Ret. Time	Peak Area	Norm Mole%	Norm Weight%	Norm Volume%	
Methane	5.89	4559504.2	24.7852	9.5076	15.4834	
Ethane	6.02	8632312.8	23.7642	17.0864	23.4256	
Propane	6.32	11394255.4	20.4126	21.5236	20.7318	
iso-Butane	6.82	3335155.8	4.4718	6.2147	5.3918	
n-Butane	7.20	8489667.8	11.2799	15.6764	13.1079	
iso-Pentane	8.55	3712595.6	3.9094	6.7443	5.2745	
n-Pentane	9.19	3997922.4	4.2504	7.3326	5.6740	
Hexanes Plus	0.00	0.0	7.1265	15.9144	10.9110	
Total:			100.0000	100.0000	100.0000	

NGL Lab Analysis - Continued

C6+ Extended Fraction Component Results

#	Component	C6+ Wt%	C6+ Mol%	C6+ Vol%
14	2-2-Dimethylbutane	1.9678	2.1327	2.1424
15	Cyclopentane/2-3-Dimethylbutane	15.3916	18.3934	15.5166
17	3-Methylpentane	8.5505	9.2671	9.0964
18	n-Hexane	18.1494	19.6709	19.4667
20	Methylcyclopentane/2-4-Dimethylpentane	2.5949	2.8797	2.4511
21	2-2-3-Trimethylbutane	1.3357	1.2450	1.4036
22	Benzene	0.2716	0.3248	0.2185
24	Cyclohexane	2.2730	2.5225	2.0650
25	2-Methylhexane	6.2254	5.8027	6.4849
26	2-3-Dimethylpentane	1.5680	1.4615	1.5956
29	3-Ethylpentane	1.0221	0.9527	1.0350
31	2-2-4-Trimethylpentane	0.6091	0.4980	0.6227
32	n-Heptane	9.6633	9.0073	10.0007
34	Methylcyclohexane/1-1-3-Trimethylcyclopentane/2-2-Dimethylhexane	5.1215	4.8717	4.7104
35	2-5-Dimethylhexane	0.5164	0.4222	0.5266
36	2-4-Dimethylhexane/Ethylcyclopentane/2-2-3-Trimethylpentane	0.9931	0.8120	1.0031
37	3-3-Dimethylhexane	0.3443	0.2815	0.3478
38	trans-1-2,cis-3-Trimethylcyclopentane	0.0927	0.0758	0.0936
39	2-3-4-Trimethylpentane	0.0530	0.0433	0.0535
40	Toluene	0.8011	0.8120	0.6541
43	2-methylheptane	0.0530	0.0433	0.0537
44	4-methylheptane	2.1052	1.7213	2.1137
45	3-4-Dimethylhexane	1.0195	0.8336	1.0236
46	3-methylheptane	0.1059	0.0866	0.1062
52	1-1-Dimethylcyclohexane	0.2471	0.2057	0.2283
54	1-methyl-1-ethylcyclopentane/Cycloheptane	0.0390	0.0325	0.0360
56	trans-1-2-Dimethylcyclohexane	11.4976	9.5702	10.4959
57	C9 Unknown 1	0.3772	0.3140	0.3443
58	trans-1-3-Dimethylcyclohexane	0.0650	0.0541	0.0586
61	2-2-Dimethylheptane	0.0520	0.0433	0.0469
62	2-4-Dimethylheptane	0.2601	0.2165	0.2346
64	2-2-3-Trimethylhexane	0.0390	0.0325	0.0352
65	cis-1-2-Dimethylcyclohexane	0.1170	0.0974	0.1040
66	Ethylcyclohexane	0.9495	0.7903	0.8530
68	2-3-3-Trimethylhexane/1-1-3-Trimethylcyclohexane	0.0781	0.0650	0.0702
69	1-1-4-Trimethylcyclohexane	0.0911	0.0758	0.0818
70	C9 Unknown 3	0.0261	0.0217	0.0234
71	2-3-4-Trimethylhexane	0.0520	0.0433	0.0467
74	2-3-Dimethylheptane	0.2092	0.1840	0.1708
76	2-methyloctane/4-methyloctane	1.2675	1.1151	1.0385
77	3-methyloctane	0.7876	0.6929	0.6453
78	C9 Unknown 5	0.0984	0.0866	0.0806
80	o-Xylene	0.0984	0.0866	0.0792
82	C9 Unknown 6	0.0369	0.0325	0.0297
84	n-Nonane	1.2041	0.8769	1.1875
85	1-2-cis,trans-3-Trimethylcyclohexane/1-2-cis,cis-3-Trimethylcyclohexane	0.1189	0.0866	0.1173
87	Isopropylbenzene	0.1394	0.1083	0.1145
88	2-2-Dimethyloctane	0.1394	0.1083	0.1145
89	Cyclooctane/iso-propylcyclohexane	0.0390	0.0325	0.0330
90	C10 Unknown 2	0.0390	0.0325	0.0330
91	C10 Unknown 3	0.0130	0.0108	0.0110
92	n-Propylcyclohexane/n-butylcyclopentane	0.0439	0.0325	0.0392
93	3-3-Dimethyloctane	0.0293	0.0217	0.0261
97	m-ethyltoluene	0.0696	0.0541	0.0572
98	p-ethyltoluene/2-3-Dimethyloctane	0.1533	0.1191	0.1259
100	2-methylnonane	0.0279	0.0217	0.0228
101	3-ethyloctane	0.1394	0.1083	0.1141
103	C10 Unknown 6	0.0557	0.0433	0.0456
105	C10 Unknown 8	0.2786	0.2165	0.2280
112	C11 Unknown 1	0.0312	0.0217	0.0256
114	1-methyl-3-isopropylbenzene	0.0279	0.0217	0.0221
116	C11 Unknown 2	0.0139	0.0108	0.0110
122	1-3-Diethylbenzene/1-methyl-3-propylbenzene	0.0326	0.0217	0.0289
123	n-Butylbenzene	0.0312	0.0217	0.0257
124	1-4-Diethylbenzene	0.0312	0.0217	0.0257
126	1-4-Dimethyl,2-ethylbenzene	0.0312	0.0217	0.0257
132	C11 Unknown 8	0.0777	0.0541	0.0640
153	Naphthalene	0.0155	0.0108	0.0128
	Total:	100.0000	100.0000	100.0000

Natural Gas Liquid (NGL) Composition

NGL Composition (04/15/14) 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	---	---	---	---	---
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	0.625274	27.5718	53.6920	72,656.53
i-Butane**	75-28-5	C4H10	58.122	7.8072	0.078070	4.5376	8.8363	11,957.37
n-Butane**	106-97-8	C4H10	58.122	16.5929	0.165925	9.6439	18.7801	25,413.40
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	3.7435	0.037434	2.7008	5.2594	7,117.14
n-Pentane**	109-66-0	C5H12	72.149	3.9706	0.039705	2.8647	5.5785	7,548.90
Cyclohexane**	110-82-7	C6H12	84.159	0.2330	0.002330	0.1961	0.3818	516.72
Other Hexanes**	varies	C6H14	86.175	1.6520	0.016520	1.4236	2.7722	3,751.38
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	2,463.83
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	0.0001	0.000001	0.0001	0.0002	0.28
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**	**51.3519**	**100.00**	**135,320.93**
THC:				**100.00**	**1.0000**	**51.3519**	**100.00**	**135,320.93**
Total VOC:				**98.67**	**0.9866**	**50.9498**	**99.22**	**134,261.39**
Total HAP:				**1.16**	**0.0116**	**1.0113**	**1.97**	**2,664.91**

* = 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	---	---	---	---	---	---
Methane	75-82-8	CH4	---	---	---	---	---	---
Ethane	74-84-0	CH5	1.337	0.783	1,059.53	1.388	1.000	**1,100.00**
VOC (Propane)	74-98-6	C3H8	98.665	99.217	134,261.39	100.000	100.000	**135,000.00**
n-Hexane	110-54-3	C6H14	1.0850	1.8207	2,463.83	2.2019	3.6949	**5,000.00**
Benzene	71-43-2	C6H6	0.0180	0.0274	37.05	0.0729	0.1108	**150.00**
Toluene	108-88-3	C7H8	0.0250	0.0449	60.70	0.1030	0.1847	**250.00**
Ethylbenzene	100-41-4	C8H10	0.0001	0.0002	0.28	0.0036	0.0074	**10.00**
Xylenes	1330-20-7	C8H10	0.0250	0.0517	69.94	0.1072	0.2217	**300.00**
2,2,4-Trimethylpentane	540-84-1	C8H18	0.0110	0.0245	33.11	0.0498	0.1108	**150.00**
Total HAP:	Various	C6 thru C8	1.1641	1.9693	2,664.91	2.5383	4.3304	**10,700.00**

105.0767

Dehydrator Inlet Gas Composition

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	0.810262	12.9986	65.2631	34,253.53
Ethane*	74-84-0	C2H6	30.069	12.9568	0.129571	3.8961	19.5614	10,266.84
Propane**	74-98-6	C3H8	44.096	3.5869	0.035870	1.5817	7.9414	4,168.06
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	0.0001	0.000001	0.0001	0.0005	0.28
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**	**19.9172**	**100.00**	**52,485.26**
THC:				**99.52**	**0.9952**	**19.7617**	**99.22**	**52,075.49**
Total VOC:				**5.54**	**0.0554**	**2.8670**	**14.39**	**7,555.11**
Total HAP:				**0.06**	**0.0006**	**0.0552**	**0.28**	**145.58**

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

#UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 ^{o}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	34,253.53	99.348	75.000	**42,000.00**
Ethane	74-84-0	CH5	12.957	19.561	10,266.84	---	---	**---**
VOC (Propane)	74-98-6	C3H8	5.537	14.395	7,555.11	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	0.0001	0.0005	0.28	0.0018	0.0095	**5.00**
Xylenes	1330-20-7	C8H10	0.0047	0.0251	13.15	0.0071	0.0381	**20.00**
2,2,4-Trimethylpentane	540-84-1	C8H18	0.0003	0.0017	0.90	0.0017	0.0095	**5.00**
Total HAP:	Various	C6 thru C8	0.0628	0.2774	145.58	0.0856	0.3811	**200.00**

106.3607

Dehydrator Inlet Gas Analysis

J-W Measurement Company
Canonsburg, PA
724-749-5180

Good

Customer	: 2259 - WILLIAMS	**Date Sampled**	: 07/02/2013
Station ID	: 52033-50	**Date Analyzed**	: 07/11/2013
Cylinder ID	: W1100	**Effective Date**	: 08/01/2013
Producer	: 009402-TRANS ENERGY INC	**Cyl Pressure**	: 864
Lease	: GROVES MASTER	**Temp**	: 75
Area	: 500 - OHIO VALLEY MID	**Cylinder Type**	: Spot
State	: WV	**Sample By**	: JR

COMPONENT	MOL%	GPM@14.73(PSIA)
Methane	81.0242	0.000
Ethane	12.9568	3.476
Propane	3.5869	0.991
Iso-Butane	0.4831	0.159
Normal-Butane	0.7906	0.250
Iso-Pentane	0.2243	0.082
Normal-Pentane	0.1722	0.063
Nitrogen	0.3474	0.000
Carbon-Dioxide	0.1322	0.000
Oxygen	0.0000	0.000
BENZENE	0.0012	0.000
TOLUENE	0.0030	0.001
ETHYLBENZENE	0.0000	0.000
M-XYLENE/P-XYLENE	0.0000	0.000
2,2-Dimethylbutane	0.0092	0.004
2,3-Dimethylbutane/CycloC5	0.0126	0.004
2-methylpentane	0.0516	0.021
3-methylpentane	0.0317	0.013
Normal-Hexane	0.0535	0.022
2,2-Dimethylpentane	0.0010	0.000
Methylcyclopentane	0.0082	0.003
3,3-Dimethylpentane	0.0040	0.002
CYCLOHEXANE	0.0054	0.002
2-Methylhexane	0.0216	0.010
2,3-Dimethylpentane	0.0042	0.001
3-Methylhexane	0.0143	0.007
1,t3-Dimethylcyclopentane	0.0002	0.000
1,t2-DMCYC5 / 2,2,4-TMC5	0.0003	0.000
N-Heptane	0.0173	0.008
METHYLCYCLOHEXANE	0.0112	0.005
2,5-Dimethylhexane	0.0012	0.001
2,3-Dimethylhexane	0.0013	0.001
2-Methylheptane	0.0049	0.003
4-Methylheptane	0.0019	0.001
3-Methylheptane	0.0036	0.002
1,t4-Dimethylcyclohexane	0.0016	0.001
N-OCTANE / 1,T2-DMCYC6	0.0051	0.002
1,t3-DMCYC6/1,C4-DMCYC6/1,C2,C3-TMCYC5	0.0011	0.000
2,4,4 TMC6	0.0000	0.000
2,6-Dimethylheptane / 1,C2-DMCYC6	0.0009	0.000
Ethylcyclohexane	0.0005	0.000
M-XYLENE	0.0029	0.001
P-XYLENE	0.0016	0.001
O-XYLENE	0.0002	0.000
NONANE	0.0021	0.001
N-DECANE	0.0016	0.001
N-UNDECANE	0.0013	0.001
TOTAL	**100.0000**	**5.140**

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment H - MSDS and Lab Analysis

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	**0.4861**	0.004861	0.1362	0.6442	358.88
Hydrogen Sulfide	2148-87-8	H2S	34.086	**---**	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	**0.1873**	0.001873	0.0824	0.3900	217.24
Methane*	75-82-8	CH4	16.042	**74.6090**	0.746108	11.9694	56.6200	31,541.43
Ethane*	74-84-0	C2H6	30.069	**16.9236**	0.169241	5.0889	24.0725	13,410.13
Propane**	74-98-6	C3H8	44.096	**5.5268**	0.055270	2.4372	11.5287	6,422.31
i-Butane**	75-28-5	C4H10	58.122	**0.5253**	0.005253	0.3053	1.4443	804.59
n-Butane**	106-97-8	C4H10	58.122	**1.1696**	0.011697	0.6798	3.2159	1,791.48
Cyclopentane**	287-92-3	C5H10	70.100	**---**	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	**0.1926**	0.001926	0.1390	0.6574	366.21
n-Pentane**	109-66-0	C5H12	72.149	**0.2113**	0.002114	0.1525	0.7213	401.84
Cyclohexane**	110-82-7	C6H12	84.159	**0.0100**	0.000100	0.0084	0.0400	22.26
Other Hexanes**	varies	C6H14	86.175	**0.0672**	0.000672	0.0579	0.2740	152.66
Methylcyclohexane**	varies	C7H14	98.186	**0.0056**	0.000056	0.0055	0.0258	14.38
Heptanes**	varies	C7H16	100.202	**0.0257**	0.000257	0.0258	0.1219	67.93
C8+ Heavies**	varies	C8+	114.229	**0.0078**	0.000078	0.0089	0.0421	23.47
n-Hexane***	110-54-3	C6H14	86.175	**0.0472**	0.000472	0.0407	0.1925	107.24
Benzene***	71-43-2	C6H6	78.112	**0.0007**	0.000007	0.0006	0.0027	1.50
Toluene***	108-88-3	C7H8	92.138	**0.0012**	0.000012	0.0011	0.0051	2.85
Ethylbenzene***	100-41-4	C8H10	106.165	**0.0001**	0.000001	0.0001	0.0005	0.28
Xylenes***	1330-20-7	C8H10	106.165	**0.0001**	0.000001	0.0001	0.0005	0.28
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	**0.0001**	0.000001	0.0001	0.0005	0.30
Totals:				**100.00**	**1.0000**	**21.1399**	**100.00**	**55,707.25**
THC:				**99.32**	**0.9933**	**20.9213**	**98.97**	**55,131.13**
Total VOC:				**7.79**	**0.0779**	**3.8630**	**18.27**	**10,179.58**
Total HAP:				**0.049**	**0.00049**	**0.0427**	**0.202**	**112.45**

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

#UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 ^{o}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			20% Safety Margin Assumed "Worst-Case" Parameters		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	0.187	0.390	217.24	0.225	0.468	**260.69**
Methane	75-82-8	CH4	74.609	56.620	31,541.43	89.531	67.944	**37,849.71**
Ethane	74-84-0	C2H6	16.924	24.072	13,410.13	---	---	**---**
VOC (Propane)	74-98-6	C3H8	7.742	18.071	10,179.58	9.290	21.686	**12,215.49**
n-Hexane	110-54-3	C6H14	0.0472	0.1925	107.24	0.0567	0.2310	**128.68**
Benzene	71-43-2	C6H6	0.0007	0.0027	1.50	0.0009	0.0032	**1.80**
Toluene	108-88-3	C7H8	0.0012	0.0051	2.85	0.0014	0.0061	**3.43**
Ethylbenzene	100-41-4	C8H10	0.0001	0.0005	0.28	0.2000	0.9000	**0.34**
Xylenes	1330-20-7	C8H10	0.0001	0.0005	0.28	0.2000	0.9000	**0.34**
2,2,4-Trimethylpentane	540-84-1	C8H18	0.0001	0.0005	0.30	0.0001	0.0006	**0.36**
Total HAP:	Various	C6 thru C8	0.0494	0.2019	112.45	0.4591	2.0410	**134.94**

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Btu Analysis - New Process Flare

Based on Streams Disposed in New Flare Stack

Component	Formula	Molecular Weight (MW)	Component Btu/scf (HHV)	Pilot + Purge Gas		Process + Maintenance		Combined Stream	
				Flow: 1,065 scfh		Flow: 9,209 scfh		Flow: 10,274 scfh	
				Mole %	Btu/scf	Mole %	Btu/scf	Mole %	Btu/scf
Nitrogen	N2	28.013	0.0	0.4052	---	0.4955	---	0.4861	---
Hydrogen Sulfide	H2S	34.086	652.0	---	---	---	---	---	---
Carbon Dioxide	CO2	44.010	0.0	0.1754	---	0.1887	---	0.1873	---
Methane*	CH4	16.042	1,010.4	84.6798	855.643	73.4443	742.114	74.6090	753.882
Ethane*	C2H6	30.069	1,798.6	14.0913	253.441	17.2512	310.272	16.9236	304.381
Propane**	C3H8	44.096	2,572.1	0.6174	15.880	6.0946	156.760	5.5268	142.156
i-Butane**	C4H10	58.122	3,333.8	0.0100	0.333	0.5849	19.499	0.5253	17.513
n-Butane**	C4H10	58.122	3,345.3	0.0112	0.376	1.3036	43.610	1.1696	39.128
Cyclopentane**	C5H10	70.100	3,902.3	---	---	---	---	---	---
i-Pentane**	C5H12	72.149	4,110.0	0.0007	0.030	0.2148	8.828	0.1926	7.916
n-Pentane**	C5H12	72.149	4,118.8	0.0008	0.032	0.2357	9.708	0.2113	8.705
Cyclohexane**	C6H12	84.159	4,644.1	---	---	0.0112	0.520	0.0100	0.466
Other Hexanes**	C6H14	86.175	4,893.1	---	---	0.0750	3.670	0.0672	3.289
Methylcyclohexane**	C7H14	98.186	5,404.1	---	---	0.0062	0.335	0.0056	0.300
Heptanes**	C7H16	100.202	5,666.7	---	---	0.0287	1.626	0.0257	1.458
C8+ Heavies**	C8+	114.2 est	6,440.2 est	---	---	0.0087	0.560	0.0078	0.502
n-Hexane***	C6H14	86.175	4,893.1	0.0076	0.374	0.0518	2.535	0.0472	2.311
Benzene***	C6H6	78.112	3,989.4	0.0001	0.004	0.0008	0.032	0.0007	0.029
Toluene***	C7H8	92.138	4,748.6	0.0001	0.005	0.0013	0.062	0.0012	0.056
Ethylbenzene***	C8H10	106.165	5,522.7	0.0001	0.006	0.0001	0.006	0.0001	0.006
Xylenes***	C8H10	106.165	5,509.0	0.0001	0.006	0.0001	0.006	0.0001	0.006
,2,4-Trimethylpentane**	C8H18	114.229	6,924.0	0.0001	0.007	0.0001	0.007	0.0001	0.007
				100.00		100.00		100.00	
			Btu/scf (HHV):	**1,126.14**		**1,300.15**		**1,282.11**	
			MMBtu/hr (HHV):	**1.20**		**11.97**	**Total:**	**13.17**	

ATTACHMENT I

Emission Units Table

"25. Fill out the **Emission Units Table** and provide it as Attachment I."

- **Emissions Unit Table**

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment I

EMISSION UNITS TABLE

(Include all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status.)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
Equipment Authorized by R13-2826J - Fort Beeler Gas Processing Plant						
1E	CE-01	CAT G342NA Compressor Engine	2010/---	225 bhp	Existing	01-NSCR
2E	CE-02	CAT G398TA Compressor Engine	2011/---	625 bhp	Existing	02-NSCR
3E	CE-03	CAT G3612LE Compressor Engine	2010/---	3,550 bhp	Existing	01-OxCat
4E	CE-04	CAT G3612LE Compressor Engine	2010/---	3,550 bhp	Existing	02-OxCat
5E	CE-05	CAT G3612LE Compressor Engine	2010/---	3,550 bhp	Existing	03-OxCat
6E	**SSM**	**Start/Stop/Maintenance**	**2010/2017**	na	**Modified**	**Part-FL-02**
7E	RPC	Rod Packing/Crankcase	2010/---	na	Existing	na
8E	GE-01	Olympian G70LG EmGen Engine	2014/---	118 bhp	Existing	na
9E	H-01	TXP1 Hot Oil Heater	2010/---	10.00 MMBtu/hr	Existing	na
10E	H-02	TXP1 Regen Gas Heater	2010/---	4.74 MMBtu/hr	Existing	na
11E	H-03	TXP2 Regen Gas Heater	2011/---	6.60 MMBtu/hr	Existing	na
12E	H-04	TXP3 Regen Gas Heater	2012/---	6.60 MMBtu/hr	Existing	na
13E	H-05	TXP2 Heat Medium Heater	2011/---	21.22 MMBtu/hr	Existing	na
14E	H-06	TXP3 Heat Medium Heater	2012/---	21.22 MMBtu/hr	Existing	na
18E	**FL-02**	**New Process Flare (MODIFIED)**	**2014/2017**	90.00 MMscf/yr	**Modified**	na
20E	TLO	Truck Load-Out - Prod H2O/Condensate	2010/---	600,000 bbl/yr	na	na
21E	**FUG**	**Process Piping Fugitives (MODIFIED)**	**2010/2017**	**24,550 Units**	**Modified**	na
22E	T-03	Produced Water Tank (9913)	2011/---	400 bbl	na	na
23E	T-04	Produced Water Tank (9914)	2011/---	400 bbl	na	na
Please see Attachement L - Storage Tank Data Sheet (T-02, T-05 thru T-25)						
Equipment Authorized by R13-3212A - Groves Dehydration Station						
15E	DH-01	Groves Dehydrator - Flash Tank/Still Vent*	2011/---	5.00 MMscfd	na	na
16E	BLR-01	Groves Dehydrator - Reboiler*	2011/---	0.20 MMBtu/hr	na	na

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, ... or other appropriate designation.

[2] For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.

[3] New, modification, removal, etc.

[4] For Control Devices use the following numbering system: 1C, 2C, 3C, ... or other appropriate designation.

ATTACHMENT J

Emission Points Data Summary Sheet

"26. Fill out the **Emission Points Data Summary Sheet** (Table 1 and Table 2) and provide it as Attachment J."

- **Table 1 – Emissions Data**
  - 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)) (EACH)
  - 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)) (EACH)
  - TXP2 and TXP3 Heat Medium Heater - 21.22 MMBtu/hr (H-05 (13E) and H-06 (14E)) (EACH)
  - Groves Dehydrator Flash Tank and Still Vent - 5.0 MMscfd (DH-01 (15E))
  - Groves Dehydrator Reboiler - 0.20 MMBtu/hr (BLR-01 (16E))
  - New Process Flare (FL-02 (18E)) (MODIFIED)
  - Truck Load-Out (TLO (20E))
  - Process Piping Fugitive Emissions (FUG (21E)) (MODIFIED)
  - Produced H2O Storage Tank Emissions - (T-03 (22E) and T-04 (23E)) (TOTAL)
  - FACILITY-WIDE SUMMARY (Including Fugitives (FUG (1F))
  - Table 1 Notes
- **Table 2 – Release Parameter Data**

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concen-tration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	6.40	28.03	0.05	0.22	Gas	Vendor	
	Recovery Compressor Engine 01 - 225 bhp CAT G342NA (CE-01 (1E))							CO	6.80	29.77	0.99	4.35	Gas	Vendor	
								VOC	0.37	1.63	0.28	1.22	Gas	Vendor	
								SOx	1.2E-03	0.01	1.2E-03	0.01	Gas	AP-42	
								PM10/2.5	0.04	0.18	0.04	0.18	Liq/Solid	AP-42	
								Acetaldehyde	0.01	0.03	0.01	0.03	Gas	---	
								Acrolein	0.01	0.02	0.01	0.02	Gas	---	
								Benzene	3.4E-03	0.01	3.4E-03	0.01	Gas	AP-42	
								Ethylbenzene	5.3E-05	2.3E-04	5.3E-05	2.3E-04	Gas	---	
								Formaldehyde	0.12	0.54	0.03	0.13	Gas	Vendor	
								n-Hexane	---	---	---	---	Gas	AP-42	
								Methanol	0.01	0.03	0.01	0.03	Gas	---	
CE-01 (1E)	Upward Vertical	CE-01 (1E)	CE-01 (1E)	NSCR -01	NSCR	C	8,760	Toluene	1.2E-03	0.01	1.2E-03	0.01	Gas	AP-42	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	4.1E-04	1.8E-03	4.1E-04	1.8E-03	Gas	---	
								Other HAP	3.8E-04	0.00	3.8E-04	0.00	Gas	AP-42	
								Total HAP	0.15	0.65	0.05	0.23	Gas	Sum	
								CO2	249	1,093	249	1,093	Gas	40CFR98	
								CH4	0.89	3.91	0.89	3.91	Gas	Vendor	
								N2O	4.7E-04	2.0E-03	4.7E-04	2.0E-03	Gas	40CFR98	
								CO2e	272	1,191	272	1,191	Gas	Wgt Sum	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concen-tration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	13.50	59.14	0.69	3.02	Gas	Vendor	
	Recovery Compressor Engine 02 - 625 bhp CAT G398TA (CE-02 (2E))							CO	14.74	64.58	0.69	3.04	Gas	Vendor	
								VOC	0.41	1.81	0.09	0.39	Gas	Vendor	
								SOx	3.4E-03	0.01	3.4E-03	0.01	Gas	AP-42	
								PM10/2.5	0.11	0.49	0.11	0.49	Liq/Solid	AP-42	
								Acetaldehyde	0.02	0.07	3.2E-03	0.01	Gas	---	
								Acrolein	0.02	0.07	3.1E-03	0.01	Gas	---	
								Benzene	0.01	0.04	1.8E-03	0.01	Gas	AP-42	
								Ethylbenzene	1.4E-04	6.3E-04	2.9E-05	1.3E-04	Gas	---	
								Formaldehyde	0.14	0.60	0.03	0.14	Gas	Vendor	
								n-Hexane	---	---	---	---	Gas	AP-42	
								Methanol	0.02	0.08	3.6E-03	0.02	Gas	---	
CE-02 (2E)	Upward Vertical	CE-02 (2E)	CE-02 (2E)	NSCR -02	NSCR	C	8,760	Toluene	3.2E-03	0.01	6.5E-04	0.00	Gas	AP-42	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	1.1E-03	5.0E-03	2.3E-04	9.9E-04	Gas	---	
								Other HAP	0.00	0.00	2.1E-04	9.1E-04	Gas	AP-42	
								Total HAP	0.20	0.88	0.05	0.20	Gas	Sum	
								CO2	684	2,995	684	2,995	Gas	40CFR98	
								CH4	1.10	4.83	1.10	4.83	Gas	Vendor	
								N2O	1.3E-03	0.01	1.3E-03	0.01	Gas	40CFR98	
								CO2e	712	3,117	712	3,117	Gas	Wgt Sum	

Continued …

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concen-tration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	3.91	17.14	3.91	17.14	Gas	Vendor	
	TXP1 Compressor Engines 03 thru 05 - 3,550 bhp CAT G3612LE (CE-03 (3E) thru CE-05 (5E)) (EACH)							CO	21.52	94.27	2.15	9.43	Gas	Vendor	
								VOC	7.12	31.19	2.85	12.48	Gas	Vendor	
								SOx	1.5E-02	0.07	1.5E-02	0.07	Gas	AP-42	
								PM10/2.5	0.26	1.14	0.26	1.14	Liq/Solid	AP-42	
								Acetaldehyde	0.22	0.96	1.1E-01	0.48	Gas	---	
								Acrolein	0.13	0.59	6.7E-02	0.29	Gas	---	
								Benzene	0.01	0.05	5.7E-03	0.03	Gas	AP-42	
								Ethylbenzene	1.0E-03	4.5E-03	5.2E-04	2.3E-03	Gas	---	
								Formaldehyde	2.03	8.91	0.31	1.34	Gas	Vendor	
								n-Hexane	2.9E-02	0.13	1.4E-02	0.06	Gas	AP-42	
CE-03/3E CE-04/4E CE-05/5E	Upward Vertical	CE-03/3E CE-04/4E CE-05/5E	CE-03/3E CE-04/4E CE-05/5E	OxCat -03 OxCat -04 OxCat -05	Oxidation Catalyst	C	8760 (Each)	Methanol	0.07	0.29	3.3E-02	0.14	Gas	---	
								Toluene	1.1E-02	0.05	5.3E-03	0.02	Gas	AP-42	
								2,2,4-TMP	6.5E-03	0.03	3.3E-03	1.4E-02	Gas	---	
								Xylenes	4.8E-03	2.1E-02	2.4E-03	1.1E-02	Gas	---	
								Other HAP	0.01	0.04	4.2E-03	1.8E-02	Gas	AP-42	
								Total HAP	2.52	11.06	0.55	2.41	Gas	Sum	
								CO2	3,451	15,117	3,451	15,117	Gas	Vendor	
								CH4	42.81	187.51	42.81	187.51	Gas	Vendor	
								N2O	5.8E-03	0.03	5.8E-03	0.03	Gas	40CFR98	
								CO2e	4,523	19,813	4,523	19,813	Gas	Wgt Sum	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	---	---	---	---	Gas	---	
								CO	---	---	---	---	Gas	---	
	Startup/Shutdown/Maintenance (Including Blowdown) (SSM (6E))							VOC	---	9.57	---	8.24	Gas	Various	
								SOx	---	---	---	---	Gas	---	
								PM10/2.5	---	---	---	---	Liq/Solid	---	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	---	2.1E-03	---	1.6E-03	Gas	Various	
								Ethylbenzene	---	2.1E-03	---	1.6E-03	Gas	Various	
								Formaldehyde	---	---	---	---	Gas	---	
								n-Hexane	---	0.16	---	0.13	Gas	Various	
								Methanol	---	---	---	---	Gas	---	
SSM (6E)	na	SSM (6E)	SSM (6E)	FL-02 (18E)	Flare (Partial)	I	na	Toluene	---	2.1E-03	---	1.6E-03	Gas	Various	
								2,2,4-TMP	---	2.1E-03	---	1.6E-03	Gas	---	
								Xylenes	---	2.1E-03	---	1.6E-03	Gas	Various	
								Other HAP	---	---	---	---	Gas	---	
								Total HAP	---	0.17	---	0.13	Gas	---	
								CO2	---	---	---	---	Gas	---	
								CH4	---	225	---	164	Gas	Various	
								N2O	---	---	---	---	Gas	---	
								CO2e	---	5,617	---	4,094	Gas		

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concen-tration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	---	---	---	---	Gas	---	
								CO	---	---	---	---	Gas	---	
		Compressor Rod Packing and Engine Crankcase (RPC (7E))						VOC	2.81	12.29	2.81	12.29	Gas	vendor	
								SOx	---	---	---	---	Gas	---	
								PM10/2.5	---	---	---	---	Liq/Solid	---	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	0.01	0.04	0.01	0.04	Gas	mass bal	
								Ethylbenzene	0.01	0.04	0.01	0.04	Gas	mass bal	
								Formaldehyde	0.05	0.22	0.05	0.22	Gas	---	
								n-Hexane	0.01	0.04	0.01	0.04	Gas	mass bal	`
								Methanol	---	---	---	---	Gas	---	
RPC (7E)	na	RPC (7E)	RPC (7E)	na	na	C	8,760	Toluene	0.01	0.04	0.01	0.04	Gas	mass bal	
								2,2,4-TMP	0.01	0.04	0.01	0.04	Gas	mass bal	
								Xylenes	0.01	0.04	0.01	0.04	Gas	mass bal	
								Other HAP	---	---	---	---	Gas	---	
								Total HAP	0.10	0.44	0.10	0.44	Gas	---	
								CO2	85	371	85	371	Gas	---	
								CH4	41.19	180	41	180	Gas	mass bal	
								N2O	---	---	---	---	Gas	---	
								CO2e	1,115	4,882	1,115	4,882	Gas		

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	0.93	0.23	0.93	0.23	Gas	Vendor	
	Emergency Generator Engine - 118 bhp Olympian G70LG (GE-01 (8E))							CO	29.10	7.28	29.10	7.28	Gas	Vendor	
								VOC	0.38	0.10	0.38	0.10	Gas	Vendor	
								SOx	8.9E-04	2.2E-04	8.9E-04	2.2E-04	Gas	AP-42	
								PM10/2.5	0.03	0.01	0.03	0.01	Liq/Solid	AP-42	
								Acetaldehyde	4.2E-03	1.1E-03	4.2E-03	1.1E-03	Gas	---	
								Acrolein	4.0E-03	9.9E-04	4.0E-03	9.9E-04	Gas	---	
								Benzene	2.4E-03	6.0E-04	2.4E-03	6.0E-04	Gas	AP-42	
								Ethylbenzene	3.7E-05	9.4E-06	3.7E-05	9.4E-06	Gas	---	
								Formaldehyde	0.03	0.01	0.03	0.01	Gas	Vendor	
								n-Hexane	---	---	---	---	Gas	AP-42	
								Methanol	4.6E-03	1.2E-03	4.6E-03	1.2E-03	Gas	---	
GE-01 (8E)	Upward Vertical	GE-01 (8E)	GE-01 (8E)	na	na	I	500	Toluene	8.4E-04	2.1E-04	8.4E-04	2.1E-04	Gas	AP-42	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	2.9E-04	7.4E-05	2.9E-04	7.4E-05	Gas	---	
								Other HAP	2.7E-04	6.8E-05	2.7E-04	6.8E-05	Gas	AP-42	
								Total HAP	0.05	0.01	0.05	0.01	Gas	Sum	
								CO2	136	34	136	34	Gas	40CFR98	
								CH4	1.26	0.31	1.26	0.31	Gas	Vendor	
								N2O	1.3E-03	3.3E-04	1.3E-03	3.3E-04	Gas	40CFR98	
								CO2e	168	42	168	42	Gas	Wgt Sum	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concen-tration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	1.09	4.76	1.09	4.76	Gas	AP-42	
	TXP1 Hot Oil Heater - 10.0 MMBtu/hr (H-01 (9E))							CO	0.91	4.00	0.91	4.00	Gas	AP-42	
								VOC	0.06	0.26	0.06	0.26	Gas	AP-42	
								SOx	0.01	0.03	0.01	0.03	Gas	AP-42	
								PM10/2.5	0.08	0.36	0.08	0.36	Liq/Solid	AP-42	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	2.3E-05	1.0E-04	2.3E-05	1.0E-04	Gas	AP-42	
								Ethylbenzene	---	---	---	---	Gas	---	
								Formaldehyde	8.2E-04	3.6E-03	8.2E-04	3.6E-03	Gas	AP-42	
								n-Hexane	0.02	0.09	0.02	0.09	Gas	AP-42	
								Methanol	---	---	---	---	Gas	---	
H-01 (9E)	Upward Vertical	H-01 (9E)	H-01 (9E)	na	na	C	8,760	Toluene	3.7E-05	1.6E-04	3.7E-05	1.6E-04	Gas	AP-42	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	---	---	---	---	Gas	---	
								Other HAP	1.3E-05	5.7E-05	1.3E-05	5.7E-05	Gas	AP-42	
								Total HAP	0.02	0.09	0.02	0.09	Gas	Sum	
								CO2	1,297	5,681	1,297	5,681	Gas	40CFR98	
								CH4	0.02	0.11	0.02	0.11	Gas	40CFR98	
								N2O	2.4E-03	0.01	2.4E-03	0.01	Gas	40CFR98	
								CO2e	1,298	5,686	1,298	5,686	Gas	Wgt Sum	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	0.52	2.26	0.52	2.26	Gas	AP-42	
	TXP1 Regenerator Gas Heater - 4.74 MMBtu/hr (H-02 (10E))							CO	0.43	1.90	0.43	1.90	Gas	AP-42	
								VOC	0.03	0.12	0.03	0.12	Gas	AP-42	
								SOx	3.1E-03	0.01	3.1E-03	0.01	Gas	AP-42	
								PM10/2.5	0.04	0.17	0.04	0.17	Liq/Solid	AP-42	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	1.1E-05	4.7E-05	1.1E-05	4.7E-05	Gas	AP-42	
								Ethylbenzene	---	---	---	---	Gas	---	
								Formaldehyde	3.9E-04	1.7E-03	3.9E-04	1.7E-03	Gas	AP-42	
								n-Hexane	0.01	0.04	0.01	0.04	Gas	AP-42	
								Methanol	---	---	---	---	Gas	---	
H-02 (10E)	Upward Vertical	H-02 (10E)	H-02 (10E)	na	na	C	8,760	Toluene	1.8E-05	7.7E-05	1.8E-05	7.7E-05	Gas	AP-42	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	---	---	---	---	Gas	---	
								Other HAP	6.2E-06	2.7E-05	6.2E-06	2.7E-05	Gas	AP-42	
								Total HAP	0.01	0.04	0.01	0.04	Gas	Sum	
								CO2	615	2,693	615	2,693	Gas	40CFR98	
								CH4	0.01	0.05	0.01	0.05	Gas	40CFR98	
								N2O	1.2E-03	0.01	1.2E-03	0.01	Gas	40CFR98	
								CO2e	615	2,695	615	2,695	Gas	Wgt Sum	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concen-tration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
		TXP2 and TXP3 Regenerator Gas Heater - 6.60 MMBtu/hr (H-03 (11E) and H-04 (12E)) (EACH)						NOx	0.72	3.14	0.72	3.14	Gas	AP-42	
								CO	0.60	2.64	0.60	2.64	Gas	AP-42	
								VOC	0.04	0.17	0.04	0.17	Gas	AP-42	
								SOx	0.00	0.02	0.00	0.02	Gas	AP-42	
								PM10/2.5	0.05	0.24	0.05	0.24	Liq/Solid	AP-42	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	1.5E-05	6.6E-05	1.5E-05	6.6E-05	Gas	AP-42	
								Ethylbenzene	---	---	---	---	Gas	---	
								Formaldehyde	5.4E-04	2.4E-03	5.4E-04	2.4E-03	Gas	AP-42	
								n-Hexane	0.01	0.06	0.01	0.06	Gas	AP-42	
								Methanol	---	---	---	---	Gas	---	
H-03 (11E) H-04 (12E)	Upward Vertical	H-03 (11E) H-04 (12E)	H-03 (11E) H-04 (12E)	na	na	C	8760 (Each)	Toluene	2.4E-05	1.1E-04	2.4E-05	1.1E-04	Gas	AP-42	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	---	---	---	---	Gas	---	
								Other HAP	8.6E-06	3.8E-05	8.6E-06	3.8E-05	Gas	AP-42	
								Total HAP	0.01	0.06	0.01	0.06	Gas	Sum	
								CO2	856	3,749	856	3,749	Gas	40CFR98	
								CH4	0.02	0.07	0.02	0.07	Gas	40CFR98	
								N2O	1.6E-03	0.01	1.6E-03	0.01	Gas	40CFR98	
								CO2e	857	3,753	857	3,753	Gas	Wgt Sum	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concen-tration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	2.31	10.10	2.31	10.10	Gas	AP-42	
	TXP2 and TXP3 Heat Medium Heater - 21.22 MMBtu/hr (H-05 (13E) and H-06 (14E)) (EACH)							CO	1.94	8.49	1.94	8.49	Gas	AP-42	
								VOC	0.13	0.56	0.13	0.56	Gas	AP-42	
								SOx	0.01	0.06	0.01	0.06	Gas	AP-42	
								PM10/2.5	0.18	0.77	0.18	0.77	Liq/Solid	AP-42	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	4.8E-05	2.1E-04	4.8E-05	2.1E-04	Gas	AP-42	
								Ethylbenzene	---	---	---	---	Gas	---	
								Formaldehyde	1.7E-03	7.6E-03	1.7E-03	7.6E-03	Gas	AP-42	
								n-Hexane	0.04	0.18	0.04	0.18	Gas	AP-42	
								Methanol	---	---	---	---	Gas	---	
H-03 (13E) H-04 (14E)	Upward Vertical	H-03 (13E) H-04 (14E)	H-03 (13E) H-04 (14E)	na	na	C	8760 (Each)	Toluene	7.8E-05	3.4E-04	7.8E-05	3.4E-04	Gas	AP-42	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	---	---	---	---	Gas	---	
								Other HAP	2.8E-05	1.2E-04	2.8E-05	1.2E-04	Gas	AP-42	
								Total HAP	0.04	0.19	0.04	0.19	Gas	Sum	
								CO2	2,752	12,054	2,752	12,054	Gas	40CFR98	
								CH4	0.05	0.23	0.05	0.23	Gas	40CFR98	
								N2O	5.2E-03	0.02	5.2E-03	0.02	Gas	40CFR98	
								CO2e	2,755	12,067	2,755	12,067	Gas	Wgt Sum	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Authorized by R13-3212A - Groves Dehydration Station

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	---	---	---	---	Gas	---	
								CO	---	---	---	---	Gas	---	
	Groves Dehydrator Flash Tank and Still Vent - 5.0 MMscfd (DH-01 (15E))							VOC	5.77	25.28	3.88	17.00	Gas	GLYCALC	
								SOx	---	---	---	---	Gas	---	
								PM10/2.5	---	---	---	---	Liq/Solid	---	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	0.08	0.34	0.07	0.31	Gas	GLYCALC	
								Ethylbenzene	---	---	---	---	Gas	---	
								Formaldehyde	---	---	---	---	Gas	---	
								n-Hexane	0.11	0.50	0.07	0.30	Gas	GLYCALC	
								Methanol	---	---	---	---	Gas	---	
DH-01 (15E)	Upward Vertical	DH-01 (15E)	DH-01 (15E)	na	na	C	8,760	Toluene	0.32	1.41	0.31	1.34	Gas	GLYCALC	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	1.00	4.37	0.98	4.27	Gas	GLYCALC	
								Other HAP	---	---	---	---	Gas	---	
								Total HAP	1.51	6.62	1.42	6.22	Gas	Sum	
								CO2	---	---	---	---	Gas	---	
								CH4	10.19	44.63	5.14	22.50	Gas	GLYCALC	
								N2O	---	---	---	---	Gas	---	
								CO2e	255	1,116	128	562	Gas	Wgt Sum	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Authorized by R13-3212A - Groves Dehydration Station

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concen-tration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	0.02	0.10	0.02	0.10	Gas	AP-42	
	Groves Dehydrator Reboiler - 0.20 MMBtu/hr (BLR-01 (16E))							CO	0.02	0.08	0.02	0.08	Gas	AP-42	
								VOC	1.2E-03	0.01	1.2E-03	0.01	Gas	AP-42	
								SOx	1.3E-04	5.7E-04	1.3E-04	5.7E-04	Gas	AP-42	
								PM10/2.5	1.7E-03	0.01	1.7E-03	0.01	Liq/Solid	AP-42	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	4.6E-07	2.0E-06	4.6E-07	2.0E-06	Gas	AP-42	
								Ethylbenzene	---	---	---	---	Gas	---	
								Formaldehyde	1.6E-05	7.1E-05	1.6E-05	7.1E-05	Gas	AP-42	
								n-Hexane	3.9E-04	1.7E-03	3.9E-04	1.7E-03	Gas	AP-42	
								Methanol	---	---	---	---	Gas	---	
BLR-01 (16E)	Upward Vertical	BLR-01 (16E)	BLR-01 (16E)	na	na	C	8,760	Toluene	7.4E-07	3.2E-06	7.4E-07	3.2E-06	Gas	AP-42	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	---	---	---	---	Gas	---	
								Other HAP	2.6E-07	1.1E-06	2.6E-07	1.1E-06	Gas	AP-42	
								Total HAP	4.1E-04	1.8E-03	4.1E-04	1.8E-03	Gas	Sum	
								CO2	25.94	113.61	25.94	113.61	Gas	40CFR98	
								CH4	4.9E-04	2.1E-03	4.9E-04	2.1E-03	Gas	40CFR98	
								N2O	4.9E-05	2.1E-04	4.9E-05	2.1E-04	Gas	40CFR98	
								CO2e	26	114	25.97	114	Gas	Wgt Sum	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

New Process Flare (FL-02/18E) (MODIFIED)

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	---	---	**45.10**	**5.69**	Gas	**AP-42**	
	New Process Flare (FL-02 (18E)) (MODIFIED)							CO	---	---	142.61	17.99	Gas	AP-42	
								VOC	4405.75	555.77	88.11	11.12	Gas	Mass Bal	
								SOx	---	---	0.27	3.4E-02	Gas	AP-42	
								PM10/2.5	---	---	3.43	0.43	Liq/Solid	AP-42	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	**0.64**	**0.08**	**0.01**	**1.6E-03**	Gas	**EE**	
								Ethylbenzene	**0.12**	**0.02**	**2.4E-03**	**3.0E-04**	Gas	**EE**	
								Formaldehyde	---	---	0.03	4.3E-03	Gas	AP-42	
								n-Hexane	**45.91**	**5.79**	**0.92**	**0.12**	Gas	**EE**	
								Methanol	---	---	---	---	Gas	---	
FL-02 (18E)	Upward Vertical	FL-02 (18E)	FL-02 (18E)	na	na	C	8,760	**Toluene**	**1.22**	**0.15**	**0.02**	**3.1E-03**	Gas	**EE**	
								2,2,4-TMP	---	---	---	---	Gas	Mass Bal	
								Xylenes	**0.12**	**0.02**	**2.4E-03**	**3.0E-04**	Gas	**EE**	
								Other HAP	5.4E-04	6.8E-05	5.4E-04	6.8E-05	Gas	AP-42	
								Total HAP	**48.01**	**6.06**	**0.99**	**0.13**	Gas	Sum	
								CO2	---	---	56,681	7,150	Gas	40CFR98	
								CH4	13,502	1,703.24	270.04	34.06	Gas	40CFR98	
								N2O	---	---	3.5E-01	0.04	Gas	40CFR98	
								CO2e	337,551	42,581	63,538	8,015	Gas	Wgt Sum	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

Truck Load-Out (TLO/20E)

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concen-tration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
TLO (20E)	Upward Vertical	TLO (20E)	TLO (20E)	na	na	I	na	NOx	---	---	---	---	Gas	---	
								CO	---	---	---	---	Gas	---	
								VOC	---	1.96	---	1.96	Gas	AP-42	
								SOx	---	---	---	---	Gas	---	
								PM10/2.5	---	---	---	---	Liq/Solid	---	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	---	0.10	---	0.10	Gas	Mass Bal	
								Ethylbenzene	---	0.10	---	0.10	Gas	Mass Bal	
								Formaldehyde	---	---	---	---	Gas	---	
								n-Hexane	---	0.10	---	0.10	Gas	Mass Bal	
								Methanol	---	---	---	---	Gas	---	
								Toluene	---	0.10	---	0.10	Gas	Mass Bal	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	---	0.10	---	0.10	Gas	Mass Bal	
								Other HAP	---	---	---	---	Gas	---	
								Total HAP	---	0.49	---	0.49	Gas	Sum	
								CO2	---	---	---	---	Gas	---	
								CH4	---	---	---	---	Gas	---	
								N2O	---	---	---	---	Gas	---	
								CO2e	---	---	---	---	Gas	---	

Truck Load-Out (TLO/20E)

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

Process Piping Fugitive Emissions (FUG/21E) (MODIFIED)

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concen-tration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	---	---	---	---	Gas	---	
								CO	---	---	---	---	Gas	---	
	Process Piping Fugitive Emissions (FUG/21E) (MODIFIED)							**VOC**	**34.57**	**151.42**	**18.48**	**80.93**	Gas	EPA	
								SOx	---	---	---	---	Gas	---	
								PM10/2.5	---	---	---	---	Liq/Solid	---	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	**0.02**	**0.09**	**0.01**	**0.05**	Gas	**EE**	
								Ethylbenzene	**0.02**	**0.09**	**0.01**	**0.05**	Gas	**EE**	
								Formaldehyde	---	---	---	---	Gas	---	
								n-Hexane	**0.95**	**4.15**	**0.53**	**2.30**	Gas	**EE**	
								Methanol	---	---	---	---	Gas	---	
FUG (21E)	na	FUG (21E)	FUG (21E)	na	na	C	8,760	**Toluene**	**0.02**	**0.09**	**0.01**	**0.05**	Gas	**EE**	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	**0.02**	**0.09**	**0.01**	**0.05**	Gas	**EE**	
								Other HAP	---	---	---	---	Gas	---	
								Total HAP	**1.03**	**4.52**	**0.57**	**2.51**	Gas	**Sum**	
								CO2	0.21	0.93	0.10	0.44	Gas	EE	
								CH4	**36.67**	**160.60**	**17.74**	**77.70**	Gas	**EE**	
								N2O	---	---	---	---	Gas	---	
								CO2e	**917**	**4,016**	**444**	**1,943**	Gas	**Wgt Sum**	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

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

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	---	---	---	---	Gas	---	
	Produced H2O Storage Tank Emissions - (T-03 (22E) and T-04 (23E)) (TOTAL)							CO	---	---	---	---	Gas	---	
								VOC	0.46	2.03	0.46	2.03	Gas	EPA	
								SOx	---	---	---	---	Gas	---	
								PM10/2.5	---	---	---	---	Liq/Solid	---	
								Acetaldehyde	---	---	---	---	Gas	---	
								Acrolein	---	---	---	---	Gas	---	
								Benzene	0.02	0.10	0.02	0.10	Gas	Mass Bal	
								Ethylbenzene	0.02	0.10	0.02	0.10	Gas	Mass Bal	
								Formaldehyde	---	---	---	---	Gas	---	
T-03 (22E) and T-04 (23E)	na	T-03 (22E) and T-04 (23E)	T-03 (22E) and T-04 (23E)	na	na	C	8,760	n-Hexane	0.02	0.10	0.02	0.10	Gas	Mass Bal	
								Methanol	---	---	---	---	Gas	---	
								Toluene	0.02	0.10	0.02	0.10	Gas	Mass Bal	
								2,2,4-TMP	---	---	---	---	Gas	---	
								Xylenes	0.02	0.10	0.02	0.10	Gas	Mass Bal	
								Other HAP	---	---	---	---	Gas	---	
								Total HAP	0.12	0.51	0.12	0.51	Gas	Sum	
								CO2	---	---	---	---	Gas	---	
								CH4	---	---	---	---	Gas	---	
								N2O	---	---	---	---	Gas	---	
								CO2e	---	---	---	---	Gas	---	

Continued …

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

FACILITY-WIDE SUMMARY

Table 1: Emissions Data - Continued

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	40.24	172.43	66.18	94.18	Gas	Sum	
								CO	121.65	412.65	186.30	89.15	Gas	Sum	
								VOC - Point	4,437.74	705.87	104.98	93.61	Gas	Sum	
								VOC - Fug	34.57	151.42	18.48	80.93	Gas	Sum	
								VOC - Total	4,472	857.29	123.46	174.54	Gas	Sum	
								SOx	0.10	0.42	0.37	0.46	Gas	Sum	
								PM10/2.5	1.55	6.66	4.98	7.09	Solid/Gas	Sum	
								Acetaldehyde	0.68	2.96	0.34	1.47	Gas	Sum	
								Acrolein	0.43	1.85	0.21	0.92	Gas	Sum	
								Benzene	0.82	0.96	0.15	0.70	Gas	Sum	
								Ethylbenzene	0.18	0.36	0.05	0.30	Gas	Sum	
								Formaldehyde	6.45	28.14	1.10	4.54	Gas	Sum	
								n-Hexane	47.22	11.82	1.73	3.88	Gas	Sum	
								Methanol	0.22	0.96	0.11	0.47	Gas	Sum	
na	na	na	na	na	na	na	na	Toluene	1.63	2.05	0.39	1.71	Gas	Sum	
								2,2,4-TMP	0.03	0.12	0.02	0.08	Gas	Sum	
								Xylenes	1.19	4.79	1.03	4.60	Gas	Sum	
								Other HAP	0.03	0.12	0.01	0.06	Gas	Sum	
								Total HAP	59	54.14	5.15	18.74	Gas	Sum	
								CO2	20,662	89,939	77,344	97,088	Gas	Sum	
								CH4	13,722	2,886	466	1,051	Gas	Sum	
								N2O	0.04	0.16	0.39	0.20	Gas	Sum	
								CO2e	363,723	162,134	89,110	123,419	Gas	Sum	

FACILITY-WIDE SUMMARY
(Including Fugitives (FUG (21E))

Table 1 Notes

Criteria Pollutants	
Pollutant	**CAS**
NO2	10102-44-0
CO	630-08-0
VOC	varies
Propane	74-98-6
i-Butane	75-28-5
n-Butane	106-97-8
SO2	7446-09-5
PM10/2.5	varies
Lead	7439-92-1
Ozone	10028-15-5

Hazardous Air Pollutants (HAPs)	
Pollutant	**CAS**
Acetaldehyde	75-07-0
Acrolein	107-02-8
Benzene	71-43-2
Ethylbenzene	100-41-4
Formadehyde	50-00-0
n-Hexane	110-54-3
Methanol	67-56-1
Toluene	108-88-3
2,2,4-TMP	540-84-1
Xylenes	1330-20-7

Greenhouse Gas (GHG) Pollutants	
Pollutant	**CAS**
CO2	124-38-9
CH4	74-82-8
N2O	10024-97-2
CO2e	na

Table 1: Notes

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

1 Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.
2 Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).
3 List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS2, VOCs, H2S, Inorganics, Lead, Organics, O3, NO, NO2, SO2, SO3, all applicable Greenhouse Gases (including CO2 and methane), etc. DO NOT LIST H2, H2O, N2, O2, and Noble Gases.
4 Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
5 Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
6 Indicate method used to determine emission rate as follows:
MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).
7 Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO2, use units of ppmv (See 45CSR10).

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment J - Emission Points Data Summary Sheet

Table 2 - RELEASE PARAMETER DATA

Emission Unit ID	Emission Point ID	Inner Diameter (Ft)	Temper-ature (oF)	Flow Rate[1] (acfm)	Ground Elevation (ft)	Stack Height[2] (ft)	Northing (km)	Easting (km)
Equipment Authorized by R13-2826J - Fort Beeler Gas Processing Plant								
1E	CE-01	1.00	1,170	851	1,400	10	4,414.33	535.00
2E	CE-02	0.75	1,112	3,040	1,400	10	4,414.33	535.00
3E	CE-03	2.00	838	24,013	1,400	34	4,414.33	535.00
4E	CE-04	2.00	838	24,013	1,400	34	4,414.33	535.00
5E	CE-05	2.00	838	24,013	1,400	34	4,414.33	535.00
6E	SSM	na	100	na	1,400	4	4,414.33	535.00
7E	RPC	na	800	na	1,400	4	4,414.33	535.00
8E	GE-01	0.50	1,250	680	1,400	8	4,414.33	535.00
9E	H-01	1.00	310	8,100	1,400	16.6	4,414.33	535.00
10E	H-02	0.75	550	4,100	1,400	14.6	4,414.33	535.00
11E	H-03	0.75	550	4,100	1,400	16.5	4,414.33	535.00
12E	H-04	0.75	550	4,100	1,400	16.5	4,414.33	535.00
13E	H-05	1.25	255	8,600	1,400	17.9	4,414.33	535.00
14E	H-06	1.25	255	8,600	1,400	17.9	4,414.33	535.00
18E	FL-02	na	1,200	na	1,400	190	4,414.33	535.00
19E	T-01	0.50	100	na	1,400	10	4,414.33	535.00
20E	TLO	0.50	100	400	1,400	10	4,414.33	535.00
21E	FUG	na	100	na	1,400	4	4,414.33	535.00
22E	T-03	0.50	100	na	1,400	10	4,414.33	535.00
23E	T-04	0.50	100	na	1,400	10	4,414.33	535.00
Equipment Authorized by R13-3212A - Groves Dehydration Station								
15E	DH-01	0.50	212	3,500	1,400	10	4414.33	535.00
16E	BLR-01	0.60	120	500	1,400	10	4414.33	535.00

1 Give at operating conditions. Include inerts.
2 Release height of emissions above ground level.

ATTACHMENT K

Fugitive Emissions Data Summary Sheet

"27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as Attachment K."

- **Application Forms Checklist**
- **Fugitive Emissions Summary**
- **Leak Source Data Sheet**

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS

1.) Will there be haul road activities?

☐ Yes ☑ No

☐ If Yes, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.

2.) Will there be Storage Piles?

☐ Yes ☑ No

☐ If Yes, then complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.

3.) Will there be Liquid Loading/Unloading Operations?

☐ Yes ☑ No

☐ If Yes, then complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.

4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation?

☐ Yes ☑ No

☐ If Yes, then complete the GENERAL EMISSIONS UNIT DATA SHEET.

5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)?

☑ **Yes** ☐ No

☑ **If Yes, then complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.**

6.) Will there be General Clean-up VOC Operations?

☐ Yes ☑ No

☐ If Yes, then complete the GENERAL EMISSIONS UNIT DATA SHEET.

7.) Will there be any other activities that generate fugitive emissions?

☐ Yes ☑ No

☐ If Yes, then complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.

If you answered “NO” to all of the items above, it is not necessary to complete the following table, “Fugitive Emissions Summary.”

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment K - Fugitive Emissions

FUGITIVE EMISSIONS DATA SUMMARY SHEET - Continued

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.
Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions.

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants Chemical Name/CAS[1]	Maximum Potential Pre-Controlled Emissions[2]		Maximum Potential Controlled Emissions[3]		Est. Method Used[4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Paved Haul Roads	na	---	---	---	---	---
Unpaved Haul Roads	na	---	---	---	---	---
Storage Pile Emissions	na	---	---	---	---	---
Loading/Unloading Operations	na	---	---	---	---	---
Wastewater Treatment	na	---	---	---	---	---
Equipment Leaks (FUG (21E)) (MODIFIED)	**VOC**	**34.57**	**151.42**	**18.48**	**80.93**	**AP-42**
	Benzene	**0.02**	**0.09**	**0.01**	**0.05**	**EE**
	Ethylbenzene	**0.02**	**0.09**	**0.01**	**0.05**	**EE**
	Formaldehyde	**---**	**---**	**---**	**---**	**---**
	n-Hexane	**0.95**	**4.15**	**0.53**	**2.30**	**EE**
	Toluene	**0.02**	**0.09**	**0.01**	**0.05**	**EE**
	2,2,4-TMP	**---**	**---**	**---**	**---**	**---**
	Xylenes	**0.02**	**0.09**	**0.01**	**0.05**	**EE**
	Other HAP	**---**	**---**	**---**	**---**	**---**
	Total HAP	**1.03**	**4.52**	**0.57**	**2.51**	**EE**
	CO2	**0.21**	**0.93**	**0.10**	**0.44**	**EE**
	CH4	**36.67**	**160.60**	**17.74**	**77.70**	**EE**
	N2O	**---**	**---**	**---**	**---**	**---**
	CO2e	**916.85**	**4,015.82**	**444**	**1,943**	**Wgt Sum**
General Clean-up VOC Emissions	na	---	---	---	---	---
Other	na	---	---	---	---	---

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases, etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in min (e.g. 5 lb VOC/20 min batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in min (e.g. 5 lb VOC/20 min batch).

[4] Indicate method used to determine emission rate as follows:
MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment K - Fugitive Emissions

DESCRIPTION OF FUGITIVE EMISSIONS

Soure Category	Pollutant	Number of Source Components[1]	Number of Components Monitored by Frequency[2]	Average Time to Repair (Days)[3]	Estimated Annual Emission Rate (lb/yr)[4]
Pumps[5]	Light Liquid VOC[6,7]				
	Heavy Liquid VOC[8]				
	Non-VOC[9]				
Valves[10]	Gas VOC				
	Light Liquid VOC				
	Heavy Liquid VOC				
	Non-VOC				
Safety Relief Valves[11]	Gas VOC				
	Light Liquid VOC				
	Non-VOC				
Open Ended Lines[12]	Gas VOC				
	Light Liquid VOC				
	Non-VOC				
Sampling Connections[13]	Gas VOC				
	Light Liquid VOC				
	Non-VOC				
Compressors	Gas VOC				
	Non-VOC				
Flanges / Connectors	Gas VOC				
	Light Liquid VOC				
	Non-VOC				
Other*	Gas VOC				
	Light Liquid VOC				
	Non-VOC				
				TOTAL (lb/yr)	**161,867**
				TOTAL (tpy)	**80.93**

FUG (21E)

Please Reference:
Attachment J - Process Piping Fugitive Emissions
Attachment K - Fugitive Emissions Summary Data Sheet
and
Attachment N - Process Piping Fugitive Emissions

*Other components include compressor seals, relief valves, diaphragms, drains, meters, etc.

Attachment K
DESCRIPTION OF FUGITIVE EMISSIONS - Continued

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.

2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in visual or soap-bubble leak detection ppm. Do not include monitoring by methods. "M/Q(M)/Q/SA/A/0" means the time period between inspections as follows:
Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/other (specify time period)

If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category valves, gas service: 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.

4. Note the method used: MB - material balance; EPA - emission factors established by EPA (cite document used);
EE - engineering estimate; 0 - other method, such as in-house emission factor (specify).

5. Do not include in the equipment count seal-less pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)

6. Volatile organic compounds (VOC) means the term as defined in 40 CFR. 51.100 (s).

7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20°C, then the fluid is defined as a light liquid.

8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°c. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20°C. then the fluid is defined as a heavy liquid.

9. LIST CO, H2S, mineral acids, NO, SO, etc. DO NOT LIST H, H2O, N, O, and Noble Gases.

10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.

11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.

12. Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.

13. Do not include closed-purge sampling connections.

ATTACHMENT L

Emissions Unit Data Sheet(s)

"28. Fill out the **Emissions Unit Data Sheet(s**) as Attachment L."

- **NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEETS**
  - 225 bhp CAT G342NA (CE-01/1E) – 4SRB Compressor Engine
  - 625 bhp CAT G398NA (CE-02/2E) – 4SRB Compressor Engine
  - 3,550 bhp CAT G3612LE (CE-03/3E thru CE-05/5E) – 4SLB Compressor Engines
  - 118 bhp Olympian G70LG (GE-01/8E) – 4SRB Emergency Generator Engine
- **NATURAL GAS FIRED HEATERS/BOILER UNIT DATA SHEETS**
  - 10.0 MMBtu/hr TXP1 Hot Oil Heater (H-01/9E)
  - 4.74 MMBtu/hr TXP-1 Regen Gas Heater (H-02/10E)
  - 6.60 MMBtu/hr TXP-2 Regen Gas Heater (H-03/11E)
  - 6.60 MMBtu/hr TXP-3 Regen Gas Heater (H-04/12E)
  - 21.22 MMBtu/hr TXP-2 Heat Medium Heater (H-05/13E)
  - 21.22 MMBtu/hr TXP-3 Heat Medium Heater (H-06/14E)
- **NATURAL GAS GLYCOL DEHYDRATION UNIT DATA SHEETS**
  - 5.0 MMscfd Glycol Dehydration Unit 01 (DH-01/15E and BLR-01/16E)
  - 40 CFR Part 63; Subpart HH & HHH Registration Form
- **TRUCK LOAD-OUT UNIT DATA SHEET**
  - 600,000 gal/yr Produced Water Load-Out (TLO/20E))
- **STORAGE TANK UNIT DATA SHEETS**
  - 400 bbl Produced Water Storage Tanks (T-03/22E and T-04/23E)

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Source Identification Number[1]		CE-04/4E		CE-05/5E		GE-01/	
Engine Manufacturer and Model		CAT G3612LE		CAT G3612LE		Olympian G70LG	
Manufacturer's Rated bhp/rpm		3,550 / 1,000		3,550 / 1,000		118 / 1,800	
Source Status[2]		ES		ES		NS	
Date Installed/Modified/Removed[3]		2010/---		2010/---		2015/---	
Manufactured/Reconstruction Date[4]		After 06/12/06		After 06/12/06		After 01/01/09	
Certified Engine (40CFR60 NSPS JJJJ)[5]		No		No		No	
Engine, Fuel and Combustion Data		LB4S		LB4S		RB4S	
Engine, Fuel and Combustion Data	APCD Type[7]	OxCat		OxCat		na	
	Fuel Type[8]	RG		RG		RG	
	H_2S (gr/100 scf)	0.2		0.2		0.2	
	Operating bhp/rpm	3,550 / 1,000		3,550 / 1,000		118 / 1,800	
	BSFC (Btu/bhp-hr)	6,629		6,629		7,650	
	Fuel (ft^3/hr)	25,579		25,579		985	
	Fuel ($MMft^3$/yr)	224.07		224.07		0.49	
	Operation (hrs/yr)	8,760		8,760		500	
	PTE[10]	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
MD	NOx	3.91	17.14	3.91	17.14	0.93	0.23
MD	CO	2.15	9.43	2.15	9.43	29.10	7.28
MD	VOC	2.85	12.48	2.85	12.48	0.38	0.10
AP	SOx	0.02	0.07	0.02	0.07	8.9E-04	2.2E-04
AP	PM10/2.5	0.26	1.14	0.26	1.14	0.03	0.01
MD	HCHO	0.31	1.34	0.31	1.34	0.03	0.01
MD/AP	Total HAP	0.55	2.41	0.55	2.41	0.05	0.01
MD/40CFR98	CO2e	4,523	19,813	4,523	19,813	168	42

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Source Identification Number[1]		CE-04/4E		CE-05/5E		GE-01/	
Engine Manufacturer and Model		CAT G3612LE		CAT G3612LE		Olympian G70LG	
Manufacturer's Rated bhp/rpm		3,550 / 1,000		3,550 / 1,000		118 / 1,800	
Source Status[2]		ES		ES		NS	
Date Installed/Modified/Removed[3]		2010/---		2010/---		2015/---	
Manufactured/Reconstruction Date[4]		After 06/12/06		After 06/12/06		After 01/01/09	
Certified Engine (40CFR60 NSPS JJJJ)[5]		No		No		No	
Engine, Fuel and Combustion Data		LB4S		LB4S		RB4S	
Engine, Fuel and Combustion Data	APCD Type[7]	OxCat		OxCat		na	
	Fuel Type[8]	RG		RG		RG	
	H_2S (gr/100 scf)	0.2		0.2		0.2	
	Operating bhp/rpm	3,550 / 1,000		3,550 / 1,000		118 / 1,800	
	BSFC (Btu/bhp-hr)	6,629		6,629		7,650	
	Fuel (ft^3/hr)	25,579		25,579		985	
	Fuel ($MMft^3$/yr)	224.07		224.07		0.49	
	Operation (hrs/yr)	8,760		8,760		500	
	PTE[10]	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
MD	NOx	3.91	17.14	3.91	17.14	0.93	0.23
MD	CO	2.15	9.43	2.15	9.43	29.10	7.28
MD	VOC	2.85	12.48	2.85	12.48	0.38	0.10
AP	SOx	0.02	0.07	0.02	0.07	8.9E-04	2.2E-04
AP	PM10/2.5	0.26	1.14	0.26	1.14	0.03	0.01
MD	HCHO	0.31	1.34	0.31	1.34	0.03	0.01
MD/AP	Total HAP	0.55	2.41	0.55	2.41	0.05	0.01
MD/40CFR98	CO2e	4,523	19,813	4,523	19,813	168	42

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Notes to **NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET**

1. Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion compressor/generator engine located at the compressor station. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. If more than three (3) engines exist, please use additional sheets.

2. Enter the Source Status using the following codes:
   NS = Construction of New Source (installation)
   ES = Existing Source
   MS = Modification of Existing Source
   RS = Removal of Source

3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.

4. Enter the date that the engine was manufactured, modified or reconstructed.

5. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart JJJJ. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4243a(2)(i) through (iii), as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

6. Enter the Engine Type designation(s) using the following codes:
   LB2S = Lean Burn Two Stroke
   RB4S = Rich Burn Four Stroke
   LB4S = Lean Burn Four Stroke

7. Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:
   A/F = Air/Fuel Ratio
   IR = Ignition Retard
   HEIS = High Energy Ignition System
   SIPC = Screw-in Precombustion Chambers
   PSC = Prestratified Charge
   LEC = Low Emission Combustion
   NSCR = Non-Selective Catalytic Reduction
   SCR = Lean Burn & Selective Catalytic Reduction

8. Enter the Fuel Type using the following codes:
   PQ = Pipeline Quality Natural Gas
   RG = Raw Natural Gas

9. Enter the Potential Emissions Data Reference designation using the following codes. Attach all referenced data to this Compressor/Generator Data Sheet(s).
   MD = Manufacturer's Data
   AP = AP-42
   GR = GRI-HAPCalcTM
   OT = Other (please list) _____

10. Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the Emissions Summary Sheet.

225 bhp CAT G342NA (4SRB@1,200 rpm)
Compressor Engine w/ NSCR

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

225 bhp CAT G342NA (4SRB@1,200 rpm)
Compressor Engine w/ NSCR

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.

625 bhp CAT G398TA (4SRB@1,200 rpm)
Compressor Engine w/ NSCR

EXTERRAN

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.

625 bhp CAT G398TA (4SRB@1,200 rpm)
Compressor Engine w/ NSCR

G398 EMISSIONS DATA @ STANDARD RATINGS

ENGINE	RATING (hp/rpm)	NOx	CO (gram/hp-hr)	HC	%02	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	9.6	1100	2251	1437	7800
NA HCR	412/1000									
	stand	18.3	0.8	1.2	2.0	10.5	1090	1895	1225	7460
	catalyst	11.2	12.1	1.7	0.5	9.5	1101	1838	1139	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	15.1	0.8	0.8	2.0	10.4	1000	1778	1220	8273
	catalyst	11.3	11.8	0.8	0.5	9.5	1032	1720	1145	8582
TA LCR	625/1200									
	stand	20.5	0.8	0.8	2.0	10.5	1040	3053	2040	8026
	catalyst	9.8	10.7	0.8	0.5	9.5	1112	3043	1929	8387
TA LCR	550/1000									
	stand	19.0	0.9	0.9	2.0	10.4	1004	2558	1750	8011
	catalyst	9.7	9.7	0.9	0.5	9.5	1056	2445	1607	8052
TA LCR	700/1200									
	stand	18.3	0.8	1.1	2.0	—	1096	3107	1999	7936
TA HCR	700/1200									
	stand	15.2	1.1	0.9	2.0	10.5	1103	3278	2155	7778
	catalyst	9.4	9.9	1.6	0.5	9.5	1132	3144	1968	7850
TA LCR	610/1000									
	stand	16.8	0.9	1.2	2.0	—	984	2484	1723	7846
TA HCR	610/1000									
	stand	14.9	0.8	1.1	2.0	10.5	1064	2775	1825	7587
	catalyst	8.9	9.6	1.8	0.5	9.5	1075	3032	1698	7804
TA HCR 32C LOW EMIS	700/1200 stand	5.0	1.6	1.4	6.2	13.6	1010	4482	3100	7643
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

625 bhp CAT G398TA (4SRB@1,200 rpm)
Compressor Engine w/ NSCR

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

EMIT TECHNOLOGIES

625 bhp CAT G398TA (4SRB@1,200 rpm)
Compressor Engine w/ NSCR

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).

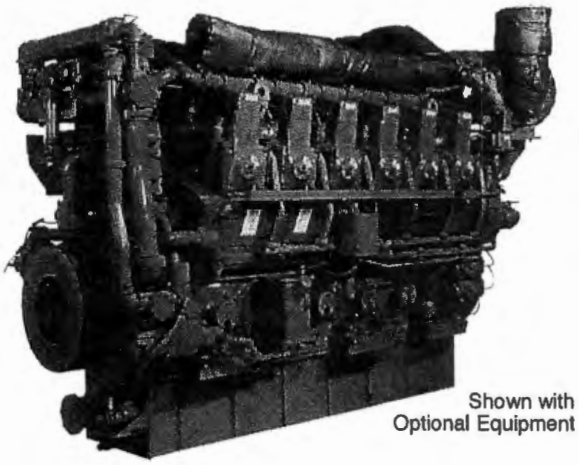
The catalyst must not be exposed to the following know poisoning agents, including: iron, nickel, sodium, chromium, arsenic, zinc, lead, phosphorous, silicon, potassium, magnesium, copper, tin, and mercury. Total poison concentrations in the gas are limited to 0.3 ppm.

3,550 bhp CAT G3612LE (4SLB@1,000 rpm)
Compressor Engines w/ OxCat (3X)
(Each)

CATERPILLAR®

G3612 LE Gas Petroleum Engine

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



Shown with Optional Equipment

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

CAT® ENGINE SPECIFICATIONS

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	734.4 L (194 gal)
Jacket Water	670 L (177 gal)
Aftercooler Circuit	64 L (17 gal)
Lube Oil System (refill)	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•S℠ 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.

3,550 bhp CAT G3612LE (4SLB@1,000 rpm)
Compressor Engines w/ OxCat (3X)
(Each)

CATERPILLAR®

G3612 LE

2647-2823 bkW (3550-3785 bhp)

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

3,550 bhp CAT G3612LE (4SLB@1,000 rpm)
Compressor Engines w/ OxCat (3X)
(Each)

CATERPILLAR®

G3612 LE

2647-2823 bkW (3550-3785 bhp)

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*					
NOx	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•m³/bkW-hr (cfm)	690.14 (24,372)	705.85 (24,927)	674.20 (23,809)	682.15 (24,090)
@ 75% Load	N•m³/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•m³/bkW-hr (scfm)	265.78 (9386)	273.91 (9673)	257.66 (9099)	264.99 (9358)
@ 75% Load	N•m³/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

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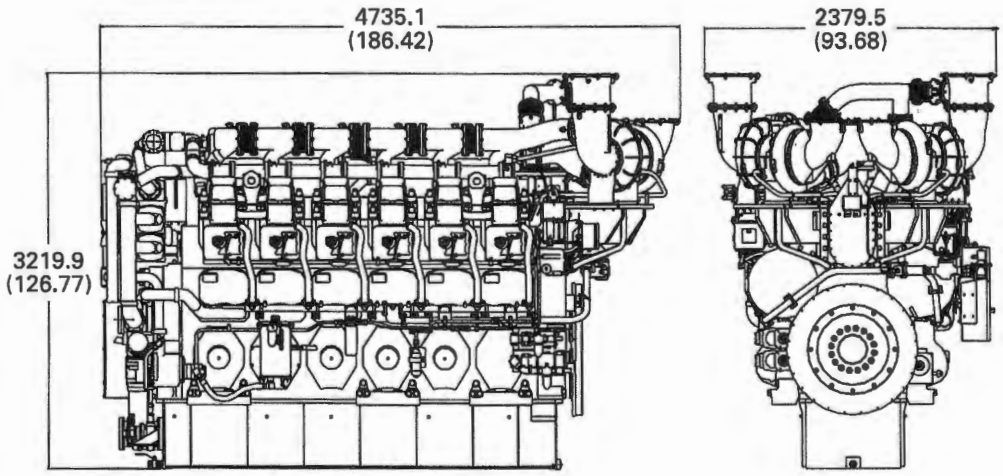
Compressor Engines w/ OxCat (3X)
(Each)

CATERPILLAR®

G3612 LE

2647-2823 bkW (3550-3785 bhp)

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.

Performance Numbers: DM5134-02, DM5309-05, DM5310-05, DM8607-01
LEHW0041-01 (2-10)

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cparisi@emittechnologies.com

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

	g/bhp-hr	Lb/Hr	Tons/Year
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

	% Reduction	g/bhp-hr	Lb/Hr	Tons/Year
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

The information in this quotation, and any files transmitted with it, is confidential and may be legally privileged. It is intended only for the use of individual(s) within the company named above. If you are the intended recipient, be aware that your use of any confidential or personal information may be restricted by state and federal privacy laws

10497 Town & Country Way, Ste. 940
Houston, TX 77024
Office: 307.673.0883 | Direct: 307.675.5073
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PRICING

		Quantity
ELH-5000Z-1820F-43CEE-36	*Carbon Steel*	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.

The information in this quotation, and any files transmitted with it, is confidential and may be legally privileged. It is intended only for the use of individual(s) within the company named above. If you are the intended recipient, be aware that your use of any confidential or personal information may be restricted by state and federal privacy laws

EXTERRAN

Oct 23, 2012

Chip Fenske
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QHSE and Operations Services
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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.

EXTERRAN

Oct 23, 2012

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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.

EXTERRAN

Oct 23, 2012

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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

NATURAL GAS FIRED BOILER/LINE HEATER DATA SHEET

(Enter glycol dehydration unit Reboiler Vent data on the Glycol Dehydration Unit Data Sheet.)

Source ID #[1]	Status[2]	Design Heat Input (MMBtu/hr)[3]	Hours of Operation (hrs/yr)[4]	Fuel Heating Value (Btu/scf)[5]	
H-01	**Exist**	**10.0**	**8,760**	**920 (LHV)**	
H-02	**Exist**	**4.74**	**8,760**	**920 (LHV)**	
H-03	**Exist**	**6.60**	**8,760**	**920 (LHV)**	
H-04	**Exist**	**6.60**	**8,760**	**920 (LHV)**	
H-05	**Exist**	**21.22**	**8,760**	**920 (LHV)**	
H-06	**Exist**	**21.22**	**8,760**	**920 (LHV)**	

Notes to NATURAL GAS FIRED BOILER/LINE HEATER DATA SHEET

1. Enter the appropriate Source Identification Numbers (Source ID #) for each boiler or line heater located at the compressor station. Boilers should be designated BLR-1, BLR-2, BLR-3, etc. Heaters or Line Heaters should be designated HTR-1, HTR-2, HTR-3, etc.
2. Enter the Status for each boiler or line heater using the following:
   EXIST Existing Equipment
   NEW Installation of New Equipment
   REM Equipment Removed
3. Enter boiler or line heater design heat input in MMBtu/hr.
4. Enter the annual hours of operation in hours/year for each boiler or line heater.
5. Enter the fuel heating value in Btu/standard cubic foot.

10.0 MMBtu/hr Hot Oil Heater
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			Mfgr:	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_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			
ENGINEER/DATE	JRG 11/13/08			
ISSUED FOR	RFQ			

4.74 MMBtu/hr Hot Oil Heater
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 Inlet	Regen Gas Outlet
Liquids	Lbs/Hr		
Density	Lbs/CuFt		
Molecular Weight			
Specific Heat	BTU/Lb °F		
Thermal Cond.	BTU/Hr-Ft-°F		
Viscosity	cP		
Vapor	Lbs/Hr	15293	15293
Density	Lbs/CuFt	3.803	1.871
Molecular Weight		21.43	21.43
Specific Heat	BTU/Lb °F	0.6041	0.7047
Thermal Cond.	BTU/HrFt °F	0.02298	0.04196
Viscosity	cP	0.01427	0.0199
Operating Temp.	°F	130	550
Operating Pressure	PSIA	950	940
Velocity	Ft/Sec		Calc.
Pressure Drop	PSI	10 Allow.	2 Calc.
Fouling Resistance	SqFt*F/BTU	0.001	
Design Press. / Temp.		1095 PSIG	650 °F
Min. Design Mtl. Temp.		-20 °F @	1095 PSIG
Corrosion Allowance		0.0625	
Insulation Thickness		3-5" high temp ceramic fiber	
Efficiency-Based on LHV	(%)	86.0%	(Assume 3% Loss)
Excess Air		15	
Firebox Unit Heat Release		32,900	BTU/Hr- Ft^3
Number of Passes		One - process , Two fireside	

Burners		Gas	Oil
LHV	(BTU/cf)	905	
Mol. Wt.		16.2	
Gravity			
Pressure Avail.	(psig)	100	
Pressure Req'd	(psig)	10	
Steam for Atomizing			
Fuel Gas Req'd (MSCFD)		129.56	N/A
Mfgr:		Eclipse WiNOx	
Type:		Forced Draft - 20 Hp Blower	
Number Req'd		One	
Pilots Req'd		Yes, electric ignition	
NOx		40 ppmvd	

Structural Design	
Wind Load, MPH, (3)	
Seismic Zone, (3)	
Ambient, °F	-20 / 110
Elevation, Ft	3000

Stack Design	
Self-supporting	Yes
Minimum Height	8 ft above top of heater
Minimum Wall Thickness:	0.125
Lining Type	No
Lining Thickness:	No
Damper:	No

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	

6.59 MMBtu/hr Hot Oil Heater
5.605 MMBtu/hr / 0.85 eff. = 6.59 MMBtu/hr (each)

THOMAS RUSSELL CO.
Tulsa, Oklahoma

JOB NO: 231
CLIENT:
SUBJECT: 200 MMscfd Cryo Plant

DATE: 9/21/2010
BY: JRG
231-13

FIRED HEATER

Service: Regen Gas Heater
Design Duty, MBTU/Hr 5605
No. of Coils per Unit One No. Units: One

Tag No: H-741
Type: Helical Coil
Model: Heatec HCI-5010-40-G

Fluid		Regen Gas Inlet	Regen Gas Outlet
Liquids	Lbs/Hr	0	0
Density	Lbs/CuFt		
Molecular Weight			
Specific Heat	BTU/Lb °F		
Thermal Cond.	BTU/Hr-Ft-°F		
Viscosity	cP		
Vapor	Lbs/Hr	20840	20840
Density	Lbs/CuFt	3.824	1.885
Molecular Weight		21.57	21.57
Specific Heat	BTU/Lb °F	0.6169	0.7189
Thermal Cond.	BTU/HrFt °F	0.0232	0.0422
Viscosity	cP	0.0143	0.0198
Operating Temp.	°F	135	550
Operating Pressure	PSIA	949	939
Velocity	Ft/Sec	Allow.	28.7 Calc.
Pressure Drop	PSI	10 Allow.	6 Calc.
Fouling Resistance	SqFt*F/BTU	0.001	
Design Press. / Temp.		1095 PSIG	650 °F
Min. Design Mtl. Temp.		-20 °F @	1095 PSIG
Corrosion Allowance		0.0625	
Insulation Thickness		3" - 5" ceramic fiber on the interior	
Efficiency-Based on LHV	(%)	85.0%	(Assume 3% Loss)
Excess Air		15	
Firebox Unit Heat Release		27,800	BTU/Hr- Ft^3
Number of Passes		One - process, Two - fireside	

Burners	Gas	Oil
LHV (BTU/cf)	973	
Mol. Wt.	18.26	
Gravity		
Pressure Avail. (psig)	100	
Pressure Req'd (psig)	10	
Steam for Atomizing		
Fuel Gas Req'd (MSCFD)	167.53	N/A
Mfgr:	Eclipse WiNOX	
Type:	Forced Draft - 20 Hp Blower	
Number Req'd	One	
Pilots Req'd	Yes , electrical ignition	
NOx	40 ppm	

Structural Design	
Wind Load, MPH, (3)	90, Exp.C, I=1.15, Cf=0.7
Seismic Zone, (3)	I = 1.25
Ambient, °F	-20 / 110
Elevation, Ft	750

Stack Design	
Self-supporting	Yes
Minimum Height	8 ft above top of heater
Minimum Wall Thickness:	0.125
Lining Type	No
Lining Thickness:	No
Damper:	No

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 Flg	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% , S_1 =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			

21.22 MMBtu/hr Hot Oil Heater
17.4 MMBtu/hr / 0.82 eff. = 21.22 MMBtu/hr (each)

THOMAS RUSSELL CO.
Tulsa, Oklahoma

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
Design Duty, MBTU/Hr 17,400
No. of Coils per Unit One No. Units: One

Tag No: H-781
Type: Helical Coil
▲ Model: HCI-10010-40(D)-G

Fluid		50:50 TEG - Water	
		Inlet	Outlet
Liquids	Lbs/Hr	333,142	333,142
Density	Lbs/CuFt	64.15	62.56
Molecular Weight		32.17	32.17
Specific Heat	BTU/Lb °F	0.859	0.882
Thermal Cond.	BTU/Hr-Ft-°F	0.223	0.220
Viscosity	cP	1.186	0.831
Vapor	Lbs/Hr	0	0
Density	Lbs/CuFt		
Molecular Weight			
Specific Heat	BTU/Lb °F		
Thermal Cond.	BTU/HrFt °F		
Viscosity	cP		
Operating Temp.	°F	195	255
Operating Pressure	PSIA	90	
Velocity	Ft/Sec		▲ 8 Calc.
Pressure Drop	PSI	20 Allow.	▲ 17 Calc.
Fouling Resistance	SqFt*F/BTU	0.0020	
Design Press. / Temp.		150 PSIG	400 °F
Min. Design Mtl. Temp.		-20 °F @	150 PSIG
Corrosion Allowance		0.125	
Insulation Thickness		3-5" high temp ceramic fiber	
Efficiency-Based on LHV	(%)	▲ 82.0%	(Assume 3% Loss)
Excess Air		15	
Firebox Unit Heat Release		▲ 28,834	BTU/Hr- Ft^3
Number of Passes		▲ Two - Process, Two - Fireside	

Burners	Gas	Oil
LHV (BTU/scf)	973	
Mol. Wt.	18.26	
Gravity		
Pressure Avail. (psig)	100	
Pressure Req'd (psig)		
Steam for Atomizing		
Fuel Gas Req'd (MSCFD)	539.10	N/A
Mfgr:	Eclipse Ratiomatic	
Type:	▲ Forced Draft - 40 HP Blower	
Number Req'd	One	
Pilots Req'd (Note 4)	Yes, electrical ignition	
NOx	▲ < 75 ppmvd	

Structural Design	
Wind Load, MPH, (3)	
Seismic Zone, (3)	
Ambient, °F	-20 / 110
Elevation, Ft	1300

Stack Design	
Self-supporting	Yes
Minimum Height	8 ft above top of heater
Minimum Wall Thickness:	0.125
Lining Type	No
Lining Thickness:	No
Damper:	No

Coil Design		Radiant	Convection-Bare	Convection-Finned	
Gas Temperature	In/Out	195 / 255			
Number Tubes		▲ Two			
Tube O.D.	In	▲ 4" Sch 40		Inlet and Outlet	▲ 8" 300# RFWN
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		1		2	
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	

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment L - Emission Unit Data Sheet

NATURAL GAS GLYCOL DEHYDRATION UNIT DATA SHEET

General Glycol Dehydration Unit Data		Manufacturer and Model		**KWI - TEG DEHYDRATOR**	
		Max Dry Gas Flow Rate (MMscf/day)		**5.0**	
		Design Heat Input (MMBtu/hr) - HHV		**0.22**	
		Design Type (DEG or TEG)		**TEG**	
		Source Status[2]		**ES**	
		Date Installed/Modified/Removed[3]		**2011/---**	
		Regenerator Still Vent APCD[4]		**NA**	
		Fuel HV (Btu/scf) - HHV		**1,020**	
		H_2S Content (gr/100 scf)		**0.2**	
		Operation (hrs/yr)		**8,760**	
Source ID #[1]	Vent	Reference[5]	PTE[6]	lbs/hr	tons/yr
DH-01/15E	**Dehydrator 01 (Flash Tank and Still Vent (Regenerator))**	**GRI-GLYCalc**	**VOC**	**3.88**	**17.00**
		GRI-GLYCalc	**Benzene**	**0.07**	**0.31**
		GRI-GLYCalc	**Ethylbenzene**	**---**	**---**
		GRI-GLYCalc	**Formaldehyde**	**---**	**---**
		GRI-GLYCalc	**n-Hexane**	**0.07**	**0.30**
		GRI-GLYCalc	**Toluene**	**0.31**	**1.34**
		GRI-GLYCalc	**2,2,4-TMP**	**---**	**---**
		GRI-GLYCalc	**Xylenes**	**0.98**	**4.27**
		GRI-GLYCalc	**Other HAPs**	**---**	**---**
		GRI-GLYCalc	**Total HAP**	**1.42**	**6.22**
		40CFR98	**CO2e**	**128**	**562**
Source ID #[1]	Vent	Reference[5]	PTE[6]	lbs/hr	tons/yr
BLR-01/16E	**Reboiler 01**	**AP**	**NOx**	**0.02**	**0.10**
		AP	**CO**	**0.02**	**0.08**
		AP	**VOC**	**1.2E-03**	**0.01**
		AP	**SO2**	**1.3E-04**	**5.7E-04**
		AP	**PM10/2.5**	**1.7E-03**	**0.01**
		Sum	**Benzene**	**4.6E-07**	**2.0E-06**
		AP	**Ethylbenzene**	**---**	**---**
		AP	**Formaldehyde**	**1.6E-05**	**7.1E-05**
		AP	**n-Hexane**	**3.9E-04**	**1.7E-03**
		AP	**Toluene**	**7.4E-07**	**3.2E-06**
		AP	**2,2,4-TMP**	**---**	**---**
		AP	**Xylenes**	**---**	**---**
		AP	**Other HAPs**	**2.6E-07**	**1.1E-06**
		SUM	**Total HAP**	**4.1E-04**	**1.8E-03**
		40CFR98	**CO2e**	**26**	**114**

NATURAL GAS GLYCOL DEHYDRATION UNIT DATA SHEET (Continued)

Notes to **NATURAL GAS GLYCOL DEHYDRATION UNIT DATA SHEET**

1. Enter the appropriate Source Identification Numbers for the glycol dehydration unit Reboiler Vent and glycol Regenerator Still Vent. The glycol dehydration unit Reboiler Vent and glycol Regenerator Still Vent should be designated RBV-1 and RSV-1, respectively. If the compressor station incorporates multiple glycol dehydration units, a Glycol Dehydration Unit Data Sheet shall be completed for each, using Source Identification #s RBV-2 and RSV-2, RBV-3 and RSV-3, etc.

2. Enter the Source Status using the following codes:
NS = Construction of New Source
ES = Existing Source
MS = Modification of Existing Source
RS = Removal of Source

3. Enter the date (or anticipated date) of the glycol dehydration unit's installation (construction of source), modification or removal.

4. Enter the Air Pollution Control Device (APCD) type designation using the following codes:
NA = None
CD = Condenser
FL = Flare
CC = Condenser/Combustion Combination
TO = Thermal Oxidizer

5. Enter the Potential Emissions Data Reference designation using the following codes:
MD = Manufacturer's Data
AP = AP-42
GR = GRI-GLYCalcTM
OT = Other (please list): _____ .

6. Enter the Reboiler Vent and glycol Regenerator Still Vent Potential to Emit (PTE) for the listed regulated pollutants in lbs per hour and tons per year. The glycol Regenerator Still Vent potential emissions may be determined using the most recent version of the thermodynamic software model GRI-GLYCalcTM (Radian International LLC & Gas Research Institute). Attach all referenced Potential Emissions Data (or calculations) and the GRI-GLYCalc Aggregate Calculations Report to this Glycol Dehydration Unit Data Sheet(s). This PTE data shall be incorporated in the Emissions Summary Sheet.

Include a copy of the GRI-GLYCalcTM analysis. This includes a printout of the aggregate calculations report, which shall include emissions reports, equipment reports, and stream reports.

***An explanation of input parameters and examples, when using GRI-GLYCalcTM is available on our website.**

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment L - Emission Unit Data Sheet

40 CFR Part 63; Subpart HH & HHH Registration Form

West Virginia Department of Environmental Protection **DH-01/17E**

Division of Air Quality DIVISION OF AIR QUALITY : (304) 926-0475

40 CFR Part 63; Subpart HH & HHH Registration Form WEB PAGE: http:\\www.wvdep.org

Complete this form for any oil and natural gas production or natural gas transmission and storage facility that uses an affected unit under HH/HHH, whether subject or not.

Section A: Facility Description		
Affected facility actual annual average natural gas throughput (scf/day):	**5.00**	
Affected facility actual annual average hydrocarbon liquid throughput: (bbl/day):	**na**	
The affected facility processes, upgrades, or stores hydrocarbon liquids prior to custody transfer.	☑ Yes	☐ No
The affected facility processes, upgrades, or stores natural gas prior to the point at which natural gas (NG) enters the NG transmission and storage source category or is delivered to the end user.	☑ Yes	☐ No
The affected facility is: ☑ prior to a NG processing plant ☐ NG processing plant ☐ prior to the point of custody transfer and there is no NG processing plant		
The affected facility transports or stores natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company).	☐ Yes	☑ No
The affected facility exclusively processes, stores, or transfers black oil with an initial producing gas-to-oil ratio (GOR): **na** scf/bbl API gravity: **na** degrees	☐ Yes	☑ No

Section B: Dehydration Unit (if applicable)[1]						
Description: **5.0 MMscfd - DH-01/15E**						
Date of Installation:	**2011**	Annual Operating Hours:	**8,760**	Burner rating (MMBtu/hr):	**0.20**	
Exhaust Stack Height (ft):	**10.0**	Stack Diameter (ft):	**0.6**	Stack Temp. (oF):	**212**	
Glycol Type:	☑ TEG ☐ EG ☐ Other: **na**					
Glycol Pump Type:	☐ Elect ☑ Gas	If Gas, what is the volume ratio?: **0.08 acfm/gpm**				
Condenser installed?	☐ Yes ☑ No	Exit Temp: **na**		Condenser Pressure: **na**		
Incinerator/flare installed?	☐ Yes ☑ No	Destruction Eff.: **na**				
Other controls installed?	☐ Yes ☑ No	Describe: **na**				
Wet Gas[2]: (Upstream of Contact Tower)	Gas Temperature: **72 oF**		Gas Pressure: **832 psig**			
	Saturated Gas?: ☑ Yes ☐ No		If no, water content?: na			
Dry Gas: (Downstream of Contact Tower)	Gas Flowrate: Actual: **5.0 MMscfd**		Design: **5.0 MMscfd**			
	Water Content: **7.0 lb/MMscf**					
Lean Glycol:	Circulation Rate: Actual[3]: **0.67 gpm**		Max[4]: **0.67 gpm**			
	Pump make/model: **Kimray 4020 PV**					
Glycol Flash Tank (if applicable):	Temp: **150 oF**	Pressure: **50 psig**	Vented: ☑ Yes ☐ No			
	If no, describe vapor control: **At least 50% of flash tank vapors used as reboiler fuel, the remainder is vented to atmosphere.**					
Stripping Gas (if applicable):	Source of Gas **na**		Rate: **na**			

40 CFR Part 63; Subpart HH & HHH Registration Form - DH-01/17E - Cont

Please attach the following required dehydration unit information:

1. System map indicating the chain of custody information. See Page 43 of this document for an example of a gas flow schematic. It is not intended that the applicant provide this level of detail for all sources. The level of detail that is necessary is to establish where the custody transfer points are located. This can be accomplished by submitting a process flow diagram indicating custody transfer points and the natural gas flow. However, the DAQ reserves the right to request more detailed information in order to make the necessary decisions.

2. Extended gas analysis from the Wet Gas Stream, including mole percent of C1-C8, benzene, ethylbenzene, toluene, xylene and n-hexane, using Gas Processors Association (GPA) 2286 (or similar). A sample should be taken from the inlet gas line, downstream from any inlet separator, and using a manifold to remove entrained liquids from the sample and a probe to collect the sample from the center of the gas line. GPA standard 2166 reference method or a modified version of EPA Method TO-14, (or similar) should be used.

3. GRI-GLYCalc Ver. 3.0 aggregate report based on maximum Lean Glycol circulation rate and maximum throughput.

4. Detailed calculations of gas or hydrocarbon flow rate.

Section C: Facility NESHAPS Subpart HH/HHH status

Affected facility status: (choose only one)

☑ Subject to Subpart HH -- However, *EXEMPT* because the facility is an area source of HAP emissions *and* the actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere is < 0.90 megagram per year (1.0 tpy); see 40CFR§63.764(e)(1)(ii).

☐ Subject to Subpart HHH

☐ Not Subject Because:

- ☐ < 10/25 TPY
- ☐ Affected facility exclusively handles black oil.
- ☐ Facility-wide actual annual average NG throughput is < 650 thousand scf/day and facility-wide actual annual average hydrocarbon liquid is < 250 bpd.
- ☐ No affected source is present.

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

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment L - Emission Unit Data Sheet

Storage Tank Data Sheet (Insignificant Emissions Units)

Source ID	Contents	Orient'n	Volume (gal)	Thru-Put (gal/yr)	VOC		HAP	
					lb/hr	tpy	lb/hr	tpy
T-01	Condensate (Meter Prover Skid Tank)	Removed						
T-02	Condensate Tank (60 Site 880 Tank)	Vertical	8,400	8,400,000	---	---	---	---
T-03	Produced Water Tank (Tank 9913)	Vertical	8,820	8,400,000	See Attachment N			
T-04	Produced Water Tank (Tank 9914)	Vertical	8,820	8,400,000	See Attachment N			
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	4.0E-03	0.02
T-07	Methanol (TXP1)	Horizontal	3,000	6,000	0.01	0.04	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	2.0E-03	0.01	2.0E-03	0.01
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:	**0.03**	**0.11**	**0.01**	**0.06**
				THRESHOLD:	**1.00**	**5.00**	**0.10**	**0.50**

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Fort Beeler 9913, 9914 Waste Tanks
City:	Moundsville
State:	West Virginia
Company:	Williams OVM
Type of Tank:	Vertical Fixed Roof Tank
Description:	210 bbl Waste Tanks

Tank Dimensions

Shell Height (ft):	15.00
Diameter (ft):	10.00
Liquid Height (ft) :	14.00
Avg. Liquid Height (ft):	8.00
Volume (gallons):	8,820.00
Turnovers:	952.38
Net Throughput(gal/yr):	8,400,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.00
Radius (ft) (Dome Roof)	10.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Fort Beeler 9913, 9914 Waste Tanks - Vertical Fixed Roof Tank
Moundsville, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Slop Liquids	All	56.69	48.70	64.69	52.55	0.2410	0.1804	0.3187	19.9891			18.28	
Heptane (-n)						0.5535	0.4327	0.7028	100.2000	0.0046	0.0097	100.20	Option 3: A=37358, B=8.2585
Hexane (-n)						1.7546	1.4148	2.1588	86.1700	0.0017	0.0113	86.17	Option 2: A=6.876, B=1171.17, C=224.41
iso-Butane						36.1072	31.2831	41.4341	58.1300	0.0001	0.0137	58.13	Option 1: VP50 = 31.982 VP60 = 38.144
Isopentane						9.3056	7.6276	11.1889	72.1500	0.0005	0.0177	72.15	Option 1: VP50 = 7.889 VP60 = 10.005
n-Butane						24.6056	21.0778	28.5399	58.1300	0.0004	0.0374	58.13	Option 1: VP50 = 21.583 VP60 = 26.098
n-Pentane						6.4112	5.3254	7.6555	72.1500	0.0006	0.0146	72.15	Option 1: VP50 = 5.476 VP60 = 6.873
Propane						103.0798	90.9417	116.2827	44.1100	0.0001	0.0391	44.11	Option 1: VP50 = 92.73 VP60 = 108.19
Residual oil no. 6						0.0000	0.0000	0.0000	190.0000	0.0096	0.0000	387.00	Option 1: VP50 = .00003 VP60 = .00004
Water						0.2297	0.1707	0.3057	18.0000	0.9824	0.8566	18.00	Option 1: VP50 = .178073 VP60 = .255246

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

Fort Beeler 9913, 9914 Waste Tanks - Vertical Fixed Roof Tank
Moundsville, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Slop Liquids	190.93	11.79	202.72
Propane	7.47	0.46	7.93
iso-Butane	2.62	0.16	2.78
n-Butane	7.13	0.44	7.57
n-Pentane	2.79	0.17	2.96
Hexane (-n)	2.16	0.13	2.30
Water	163.54	10.10	173.64
Isopentane	3.37	0.21	3.58
Heptane (-n)	1.85	0.11	1.96
Residual oil no. 6	0.00	0.00	0.00

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Fort Beeler Diesel Tank
City:	Moundsville
State:	West Virginia
Company:	Williams OVM
Type of Tank:	Horizontal Tank
Description:	500 gallon diesel tank

Tank Dimensions

Shell Length (ft):		5.80
Diameter (ft):		4.00
Volume (gallons):		500.00
Turnovers:		4.00
Net Throughput(gal/yr):		2,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Fort Beeler Diesel Tank - Horizontal Tank
Moundsville, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	56.69	48.70	64.69	52.55	0.0064	0.0043	0.0082	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0074

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

Fort Beeler Diesel Tank - Horizontal Tank
Moundsville, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.04	0.15	0.19

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Fort Beeler Gasoline Tank
City:	Moundsville
State:	West Virginia
Company:	Williams OVM
Type of Tank:	Horizontal Tank
Description:	300 gallon gasoline tank

Tank Dimensions

Shell Length (ft):		5.13
Diameter (ft):		3.20
Volume (gallons):		300.00
Turnovers:		6.67
Net Throughput(gal/yr):		2,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Fort Beeler Gasoline Tank - Horizontal Tank
Moundsville, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 12)	All	56.69	48.70	64.69	52.55	5.9671	5.1083	6.9373	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

Fort Beeler Gasoline Tank - Horizontal Tank
Moundsville, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 12)	18.19	122.44	140.63

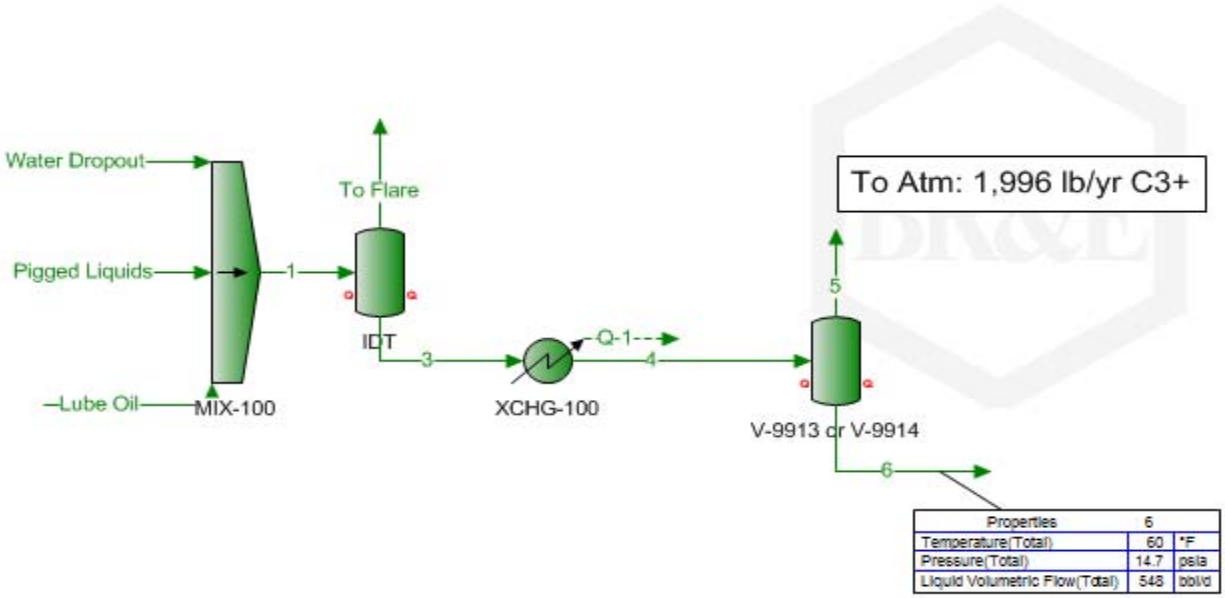
TANKS 4.0.9d
Emissions Report - Summary Format
Total Emissions Summaries - All Tanks in Report

Emissions Report for: Annual

Tank Identification				Losses (lbs)	
Fort Beeler 9913, 9914 Waste Tanks	Williams OVM	Vertical Fixed Roof Tank	Moundsville, West Virginia	202.72	each tank
Fort Beeler Diesel Tank	Williams OVM	Horizontal Tank	Moundsville, West Virginia	0.19	
Fort Beeler Gasoline Tank	Williams OVM	Horizontal Tank	Moundsville, West Virginia	140.63	
Total Emissions for all Tanks:				343.54	

VOC emissions from each tank (9913 and 9914) are 29.08 lbs (working and breathing) + 1,996 lbs (flash) = 2,025.08 lbs

Ft Beeler 9913 or 9914 Tank Flash Emissions as Proposed for Permit Revision May 2014



Location: Ft Beeler 9913 or 9914 tank Flash Emissions
Condensate Volume: 200020 bbl/yr
Total VOC's: 0.998 ton/yr

Emissions to Atmosphere		
Temperature	°F	60
Pressure	psig	0
Mole Fraction Vapor	%	100

Produced Liquids		
Temperature	°F	60
Pressure	psig	0
Std Liquid Volumetric Flow	bbl/d	548

Emissions to Atmosphere	
Component	**tons/year**
Carbon Dioxide	0.05
Nitrogen	0.00
Methane	0.36
Ethane	0.23
Propane	0.23
Isobutane	0.10
Butane	0.26
Isopentane	0.13
Pentane	0.12
Hexane	0.09
Heptane	0.08
Octane	0.00
Nonane	0.00
Decane	0.00
Water	0.02
Therminol 55	0.00

Produced Liquids	
Component	**mass fraction %**
Carbon Dioxide	0.00
Nitrogen	0.00
Methane	0.00
Ethane	0.00
Propane	0.01
Isobutane	0.01
Butane	0.04
Isopentane	0.05
Pentane	0.06
Hexane	0.17
Heptane	0.46
Octane	0.00
Nonane	0.00
Decane	0.00
Water	98.23
Therminol 55	0.96

Attachment L
EMISSIONS UNIT DATA SHEET
BULK LIQUID TRANSFER OPERATIONS

Furnish the following information for each new or modified bulk liquid transfer area or loading rack, as shown on the *Equipment List Form* and other parts of this application. This form is to be used for bulk liquid transfer operations such as to and from drums, marine vessels, rail tank cars, and tank trucks.

Identification Number (as assigned on *Equipment List Form*): **TLO**

1. Loading Area Name: **FORT BEELER**

2. Type of **cargo vessels** accommodated at this rack or transfer point (check as many as apply):

☐ Drums ☐ Marine Vessels ☐ Rail Tank Cars ☒ Tank Trucks

3. Loading Rack or Transfer Point Data:

Number of pumps	1
Number of liquids loaded	1
Maximum number of marine vessels, tank trucks, tank cars, and/or drums loading at one time	1

4. Does ballasting of **marine vessels** occur at this loading area?

☐ Yes ☐ No ☒ **Does not apply**

5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point:
NA

6. Are cargo vessels **pressure tested** for leaks at this or any other location? **NA**

☐ Yes ☐ No ☒ **Does not apply**

If YES, describe:
NA

7. **Projected Maximum Operating Schedule** (for rack or transfer point as a whole):

Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	24	24	24	24
days/week	7	7	7	7
weeks/quarter	13	13	13	13

8. **Bulk Liquid Data** *(add pages as necessary):*							
Pump ID No.		1					
Liquid Name		Prod H2O/ Oil					
Max. daily throughput (1000 gal/day)		69					
Max. annual throughput (1000 gal/yr)		25200					
Loading Method [1]		SP					
Max. Fill Rate (gal/min)		200					
Average Fill Time (min/loading)		60					
Max. Bulk Liquid Temperature (^{o}F)		50					
True Vapor Pressure [2]		0.24					
Cargo Vessel Condition [3]		U					
Control Equipment or Method [4]		None					
Minimum control efficiency (%)		N/A					
Maximum Emission Rate (VOC)	Loading (lb/hr)	---					
	Annual (lb/yr)	3920					
Estimation Method [5]		EPA					

[1] BF = Bottom Fill SP = Splash Fill SUB = Submerged Fill

[2] At maximum bulk liquid temperature

[3] B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)

[4] List as many as apply (complete and submit *Air Pollution Control Device Sheets*):
CA = Carbon Adsorption, LOA = Lean Oil Adsorption, CO = Condensation, SC = Scrubber (Absorption), CRA = Compressor-Refrigeration-Absorption, TO = Thermal Oxidation or Incineration, CRC = Compression-Refrigeration-Condensation, VB = Dedicated Vapor Balance (closed system), O = other (describe)

[5] EPA = EPA Emission Factor as stated in AP-42
MB = Material Balance
TM = Test Measurement based upon test data submittal
O = other (describe)

9. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
REPORTING	TESTING

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

ATTACHMENT M

Air Pollution Control Device Sheet(s)

"29. Fill out the **Air Pollution Control Device Sheet(s)** as Attachment M."

- **225 bhp Caterpillar G342NA Compressor Engine (CE-01/1E)**
- **625 bhp Caterpillar G398TA Compressor Engine (CE-02/2E)**
- **3,550 bhp Caterpillar G3612LE Compressor Engines (CE-03/3E thru CE-05/5E)**
- **New Process Flare (FL-02/18E) – Zeeco AFTA-20/56 90.0 MMscf/yr - MODIFIED**

Attachment M
Air Pollution Control Device Sheet
(OTHER COLLECTORS)

Control Device ID No. (must match Emission Units Table): 01-NSCR

Equipment Information

1. Manufacturer: EMIT Model No. EAS-1700T-0606F-22CEE (or equiv.)	2. Control Device Name: Catalytic Converter Type: NSCR
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. On a separate sheet(s) supply all data and calculations used in selecting or designing this collection device.	
5. Provide a scale diagram of the control device showing internal construction.	
6. Submit a schematic and diagram with dimensions and flow rates.	
7. Guaranteed minimum collection efficiency for each pollutant collected: NOx (≥99.2%), CO (≥85.4%), VOC (≥25.3%), HCHO (≥76%)	
8. Attached efficiency curve and/or other efficiency information.	
9. Design inlet volume: SCFM	10. Capacity:
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any.	
12. Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment.	
13. Description of method of handling the collected material(s) for reuse of disposal.	

Gas Stream Characteristics

14. Are halogenated organics present?	☐ Yes	☐ No
Are particulates present?	☐ Yes	☐ No
Are metals present?	☐ Yes	☐ No

15. Inlet Emission stream parameters:	Maximum	Typical
Pressure (mmHg):		
Heat Content (BTU/scf):		
Oxygen Content (%):		
Moisture Content (%):		
Relative Humidity (%):		

16. Type of pollutant(s) controlled: ☐ SO_x ☐ Odor
☐ Particulate (type): ☒ Other NOx, CO, VOC and HCHO

17. Inlet gas velocity: ft/sec

18. Pollutant specific gravity:

19. Gas flow into the collector:
851 ACFM @ 1170°F and PSIA

20. Gas stream temperature:
Inlet: 1170 °F
Outlet: °F

21. Gas flow rate:
Design Maximum: 851 ACFM
Average Expected: 851 ACFM

22. Particulate Grain Loading in grains/scf:
Inlet:
Outlet:

23. Emission rate of each pollutant (specify) into and out of collector:

Pollutant	IN Pollutant		Emission Capture Efficiency %	OUT Pollutant		Control Efficiency %
	g/bhp-hr	grains/acf		g/bhp-hr	grains/acf	
NOx	12.90		100	0.10		99.2%
CO	13.70		100	2.00		85.4%
VOC	0.75		100	0.56		25.3%
HCHO	0.25		100	0.06		76%

24. Dimensions of stack: Height ft. Diameter ft.

25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector.

Particulate Distribution

26. Complete the table:	Particle Size Distribution at Inlet to Collector	Fraction Efficiency of Collector
Particulate Size Range (microns)	Weight % for Size Range	Weight % for Size Range
0 – 2		
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12		
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

27. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):

28. Describe the collection material disposal system:

29. Have you included ***Other Collectores Control Device*** in the Emissions Points Data Summary Sheet?

30. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
REPORTING:	TESTING:

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

31. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

NOx (≥99.2%), CO (≥85.4%), VOC (≥25.3%), HCHO (≥76%)

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

33. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

Attachment M
Air Pollution Control Device Sheet
(OTHER COLLECTORS)

Control Device ID No. (must match Emission Units Table): 02-NSCR

Equipment Information

1. Manufacturer: EMIT Model No. EAS-2500T-0808F-21 CEE (or equiv.)	2. Control Device Name: Catalytic Converter Type: NSCR
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. On a separate sheet(s) supply all data and calculations used in selecting or designing this collection device.	
5. Provide a scale diagram of the control device showing internal construction.	
6. Submit a schematic and diagram with dimensions and flow rates.	
7. Guaranteed minimum collection efficiency for each pollutant collected: NOx (≥94.9%), CO (≥95.3%), VOC (≥78.7%), HCHO (≥76%)	
8. Attached efficiency curve and/or other efficiency information.	
9. Design inlet volume: SCFM	10. Capacity:
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any.	
12. Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment.	
13. Description of method of handling the collected material(s) for reuse of disposal.	

Gas Stream Characteristics

14. Are halogenated organics present?	☐ Yes	☐ No
Are particulates present?	☐ Yes	☐ No
Are metals present?	☐ Yes	☐ No

15. Inlet Emission stream parameters:	**Maximum**	**Typical**
Pressure (mmHg):		
Heat Content (BTU/scf):		
Oxygen Content (%):		
Moisture Content (%):		
Relative Humidity (%):		

16. Type of pollutant(s) controlled: ☐ SO_x ☐ Odor
☐ Particulate (type): ☒ Other NOx, CO, VOC and HCHO

17. Inlet gas velocity: ft/sec

18. Pollutant specific gravity:

19. Gas flow into the collector:
3043 ACFM @ 1112°F and PSIA

20. Gas stream temperature:
Inlet: 1112 °F
Outlet: °F

21. Gas flow rate:
Design Maximum: 3043 ACFM
Average Expected: 3043 ACFM

22. Particulate Grain Loading in grains/scf:
Inlet:
Outlet:

23. Emission rate of each pollutant (specify) into and out of collector:

Pollutant	IN Pollutant		Emission Capture Efficiency %	OUT Pollutant		Control Efficiency %
	g/bhp-hr	grains/acf		g/bhp-hr	grains/acf	
NOx	9.80		100	0.50		94.9%
CO	10.70		100	0.50		95.3%
VOC	0.30		100	0.06		78.7%
HCHO	0.10		100	0.02		76%

24. Dimensions of stack: Height ft. Diameter ft.

25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector.

Particulate Distribution

26. Complete the table:	Particle Size Distribution at Inlet to Collector	Fraction Efficiency of Collector
Particulate Size Range (microns)	Weight % for Size Range	Weight % for Size Range
0 – 2		
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12		
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

27. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):

28. Describe the collection material disposal system:

29. Have you included ***Other Collectores Control Device*** in the Emissions Points Data Summary Sheet?

30. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
REPORTING:	TESTING:

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

31. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

NOx (≥94.9%), CO (≥95.3%), VOC (≥78.7%), HCHO (≥76%)

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

33. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

Attachment M
Air Pollution Control Device Sheet
(OTHER COLLECTORS)

Control Device ID No. (must match Emission Units Table): 01-OxCat, 02-OxCat, 03-OxCat

Equipment Information

1. Manufacturer: EMIT Technologies Model No. ELH-5000Z-1820F-43CEE-36 (or equiv.)	2. Control Device Name: Catalytic Converter Type: OxCat
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. On a separate sheet(s) supply all data and calculations used in selecting or designing this collection device.	
5. Provide a scale diagram of the control device showing internal construction.	
6. Submit a schematic and diagram with dimensions and flow rates.	
7. Guaranteed minimum collection efficiency for each pollutant collected: CO (≥90%), VOC (≥60%) and HCHO (≥85%)	
8. Attached efficiency curve and/or other efficiency information.	
9. Design inlet volume: SCFM	10. Capacity:
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any.	
12. Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment.	
13. Description of method of handling the collected material(s) for reuse of disposal.	

Gas Stream Characteristics

14. Are halogenated organics present?	☐ Yes	☐ No
Are particulates present?	☐ Yes	☐ No
Are metals present?	☐ Yes	☐ No

15. Inlet Emission stream parameters:	**Maximum**	**Typical**
Pressure (mmHg):		
Heat Content (BTU/scf):		
Oxygen Content (%):		
Moisture Content (%):		
Relative Humidity (%):		

16. Type of pollutant(s) controlled: ☐ SO_x ☐ Odor
☐ Particulate (type): ☒ Other CO, VOC and HCHO

17. Inlet gas velocity: ft/sec

18. Pollutant specific gravity:

19. Gas flow into the collector:
24013 ACFM @ 838°F and PSIA

20. Gas stream temperature:
Inlet: 838 °F
Outlet: °F

21. Gas flow rate:
Design Maximum: 24013 ACFM
Average Expected: 24013 ACFM

22. Particulate Grain Loading in grains/scf:
Inlet:
Outlet:

23. Emission rate of each pollutant (specify) into and out of collector:

Pollutant	IN Pollutant		Emission Capture Efficiency %	OUT Pollutant		Control Efficiency %
	g/bhp-hr	grains/acf		g/bhp-hr	grains/acf	
CO	2.75		100	0.28		90
VOC	0.91		100	0.36		60
HCHO	0.26		100	0.04		85

24. Dimensions of stack: Height ft. Diameter ft.

25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector.

Particulate Distribution

26. Complete the table:	Particle Size Distribution at Inlet to Collector	Fraction Efficiency of Collector
Particulate Size Range (microns)	Weight % for Size Range	Weight % for Size Range
0 – 2		
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12		
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

27. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):

28. Describe the collection material disposal system:

29. Have you included ***Other Collectores Control Device*** in the Emissions Points Data Summary Sheet?

30. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
REPORTING:	TESTING:

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

31. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

CO (≥90%), VOC (≥60%) and HCHO (≥85%)

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

33. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

Attachment M
Air Pollution Control Device Sheet
(FLARE SYSTEM)

Control Device ID No. (must match Emission Units Table): FL-02

Equipment Information

1. Manufacturer: Zeeco

   Model No. AFTA-20/56

2. Method: ☒ Elevated flare ☐ Ground flare ☐ Other
   Describe

3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

4. Method of system used:
   ☐ Steam-assisted ☒ Air-assisted ☐ Pressure-assisted ☐ Non-assisted

5. Maximum capacity of flare:
   scf/min
   425,950 scf/hr

6. Dimensions of stack:
   Diameter
   Height 190 feet

7. Estimated combustion efficiency:
   (Waste gas destruction efficiency)
   Estimated: 98 %
   Minimum guaranteed: 98 %

8. Fuel used in burners:
   ☒ Natural Gas
   ☐ Fuel Oil, Number
   ☐ Other, Specify:

9. Number of burners: 1
   Rating: 541.2 MMBTU/hr (Max)

10. Will preheat be used? ☐ Yes ☒ No

11. Describe method of controlling flame:

12. Flare height: ft

13. Flare tip inside diameter: ft

14. Natural gas flow rate to flare pilot flame per pilot light: scf/min
    65 scf/hr

15. Number of pilot lights:
    Total 3

16. Will automatic re-ignition be used?
    ☒ Yes ☐ No

17. If automatic re-ignition will be used, describe the method:
    Manual/Automatic Flame Front Generator (FFG) Ignition System with Fuel Gas Train

18. Is pilot flame equipped with a monitor? ☒ Yes ☐ No
    If yes, what type? ☒ Thermocouple ☐ Infra-Red
    ☐ Ultra Violet ☐ Camera with monitoring control room
    ☐ Other, Describe:

19. Hours of unit operation per year: 8760 hr/yr.

Steam Injection

20. Will steam injection be used? ☐ Yes ☒ No	21. Steam pressure PSIG Minimum Expected: Design Maximum:
22. Total Steam flow rate: LB/hr	23. Temperature: °F
24. Velocity ft/sec	25. Number of jet streams
26. Diameter of steam jets: in	27. Design basis for steam injected: LB steam/LB hydrocarbon
28. How will steam flow be controlled if steam injection is used?	

Characteristics of the Waste Gas Stream to be Burned

29.

Name	Quantity Grains of H_2S/100 ft^3	Quantity (LB/hr, ft^3/hr, etc)	Source of Material
Natural Gas and NGL	<1.0	< 90 MMscf/yr	Cryogenic Plants

30. Estimate total combustible to flare: (Maximum mass flow rate of waste gas)	90 MMscf/yr	LB/hr or ACF/hr scfm

31. Estimated total flow rate to flare including materials to be burned, carrier gases, auxiliary fuel, etc.:
Variable LB/hr or ACF/hr

32. Give composition of carrier gases:
Variable, typically 75-90% Methane, 5-10% Ethane, and 5-8% C3+.

33. Temperature of emission stream: Extremely Variable °F Heating value of emission stream: Max Variable BTU/ft^3 Mean molecular weight of emission stream: Max Variable lb/lb-mole	34. Identify and describe all auxiliary fuels to be burned. BTU/scf BTU/scf BTU/scf BTU/scf BTU/scf
35. Temperature of flare gas: °F	36. Flare gas flow rate: Variable scf/min
37. Flare gas heat content: Variable BTU/ft^3	38. Flare gas exit velocity: Variable scf/min

39. Maximum rate during emergency for one major piece of equipment or process unit: 7,099 scf/min

40. Maximum rate during emergency for one major piece of equipment or process unit: 8.9 MM BTU/min

41. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

42. Describe the collection material disposal system:
na

43. Have you included ***Flare Control Device*** in the Emissions Points Data Summary Sheet? Yes

44. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING: Presence of Pilot Flame (Daily)	RECORDKEEPING: MMscf/mo of Waste Gas
REPORTING: MMscf/yr of Waste Gas	TESTING: na

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
na

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
98% VOC/HAP

47. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

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

NOTE: Additional changes (changes in i nlet elevation, orientation, materials, etc) will increase the delivery time for

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_{DS} = 0.110g
S_{D1} = 0.087g
Seismic Design Category = B
Mapped Long Period Transition Period (T_L) = 12 sec

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

New Flare (FL-02)
Zeeco Process Flare

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		

New Flare (FL-02)
Zeeco Process Flare

Air Assisted Flare Tip Specification Sheet

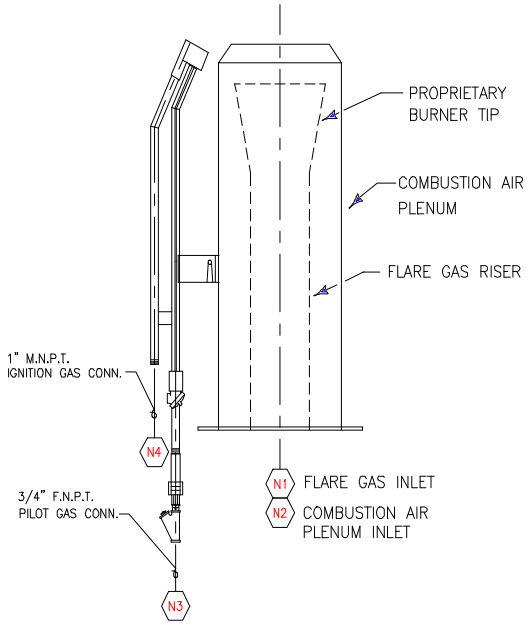
Client:	Williams	Zeeco Ref.:	T33007F	Date:	13-Mar-14
Location:	West Virginia	Client Ref.:	Ft. Beeler Flare	Rev.	3

General Information:

Tag No.:	FLR-01		
Model:	AFTA-20/56	Type:	Air-Assisted
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



(Typical drawing only)

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.

New Flare (FL-02)
Zeeco Process Flare

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:

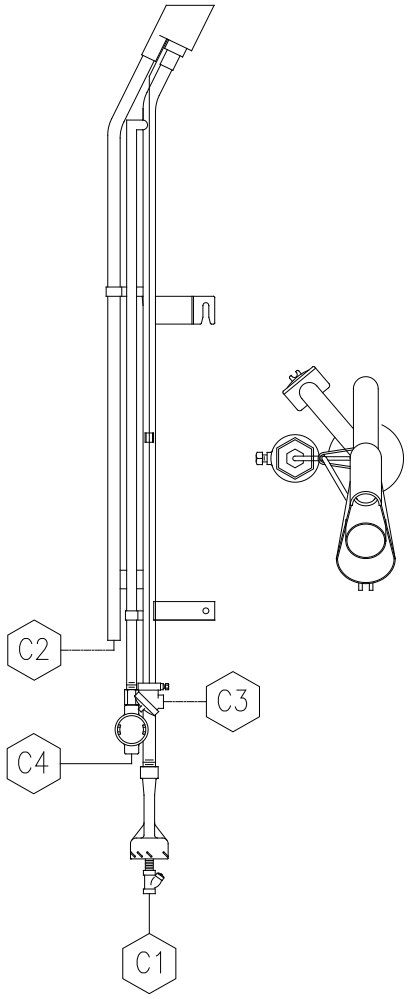
Tag No.:	FP-1	
Model:	HSLF	
Length:	9.135	feet
Weight:	68	lbs.
Pilot Type:	Pre-Mix	High Stability
Ignition Type:	Flame Front	Generator

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)

1. Upper mounting bracket is reinforced hook type for pilot removal from platform.
2. Pilot mounting brackets and thermocouple mounting brackets are investment cast assemblies.
3. Pilot mixer assembly is investment cast, high efficiency computer modeled venturi section.
4. Thermocouples are retractable type (replaceable from grade).

New Flare (FL-02)
Zeeco Process Flare

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:

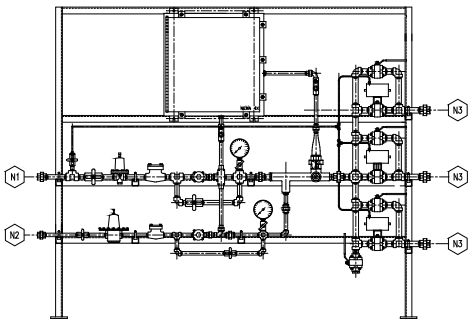
Tag No.:	IGN-1
Model No.:	LMC-3-T/S
Operation:	Manual/Automatic
No. of Pilots Ignited:	3
Area Classification:	Class 1, Div 2, Gr C/D

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.

New Flare (FL-02)
Zeeco Process Flare

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
Hosepower (each):	125
Blower Speeds:	1-speed VFD Suitable

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	

(Typical Picture)

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

ATTACHMENT N

Supporting Emissions Calculations

"30. Provide all **Supporting Emissions Calculations** as Attachment N."

- **Emission Summary Spreadsheets**
  - Criteria Pollutants - Controlled Emissions Summary
  - Hazardous Air Pollutants - Controlled Emissions Summary
  - Greenhouse Gas (GHG) - Emissions Summary
  - Pre-Controlled Emissions Summary
- **Unit-Specific Emission Spreadsheets**
  - 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))
  - Groves Dehydrator Flash Tank and Still Vent - 5.0 MMscfd (DH-01 (15E))
  - Groves Dehydrator Reboiler - 0.20 MMBtu/hr (BLR-01 (16E))
  - New Process Flare (FL-02 (18E)) (MODIFIED)
  - Truck Load-Out (TLO (20E))
  - Process Piping Fugitive Emissions (FUG (21E)) (MODIFIED)
  - Produced H2O Storage Tank Emissions (T-03 (22E) and T-04 (23E))
- **AP-42 and GHG Emission Factors**
- **GRI-GLYCalc Model Runs**
  - Groves Dehydrator Flash Tank and Still Vent - 5.0 MMscfd (DH-01 (15E))

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

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	Start/Stop/Maintenance	na	---	---	---	---	---	8.24	---	---	---	---	---	4,094
RPC	7E	Rod Packing/Crankcase	na	---	---	---	---	2.81	12.29	---	---	---	---	1,115	4,882
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-02	**18E**	**New Process Flare (MODIFIED)**	90.0 MMscf/yr	**45.10**	**5.69**	142.61	17.99	88.11	11.12	0.27	0.03	3.43	0.43	63,538	8,015
TLO	20E	Truck Load-Out - Prod H2O/Condensate	600,000 bbl/yr	---	---	---	---	---	1.96	---	---	---	---	---	---
FUG	**21E**	**Process Piping Fugitives (MODIFIED)**	**24,550 Units**	---	---	---	---	**18.48**	**80.93**	---	---	---	---	**444**	**1,943**
T-03	22E	Produced Water Tank (9913)	400 bbl	---	---	---	---	0.23	1.01	---	---	---	---	---	---
T-04	23E	Produced Water Tank (9914)	400 bbl	---	---	---	---	0.23	1.01	---	---	---	---	---	---

Gray Shaded Cells Indicate Modified Data

TOTAL FACILITY-WIDE PTE:	**66.18**	**94.18**	**186.30**	**89.15**	**123.46**	**174.54**	**0.37**	**0.46**	**4.98**	**7.09**	**89,110**	**123,419**
NNSR/PSD Threshold:		**250**		**250**		**250**		**250**		**250**		**na**
TVOP Threshold:		**100**		**100**		**100**		**100**		**100**		**100,000**

Notes: * Emission Units DH-01/15E and BLR-01/16E are authorized by Permit R13-3212A, issued 06/07/17; all other Emission Units are authorized by Permit R13-2826J, issued 06/16/16.

1 - Emissions are based on operation at 100% of rated load for 8,760 hrs/yr; except GE-01, 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

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

Hazardous Air Pollutants - Controlled Emissions Summary

Unit ID	Point ID	Acetaldehyde		Acrolein		Benzene		Ethylbenzene		Formaldehyde (HCHO)		n-Hexane		Methanol (MeOH)		Toluene		2,2,4-Trimethyl-pentane (TMP)		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	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-01	1E	0.01	0.03	0.01	0.02	3.4E-03	0.01	5.3E-05	2.3E-04	0.03	0.13	---	---	0.01	0.03	1.2E-03	0.01	---	---	4.1E-04	1.8E-03	3.8E-04	0.00	**0.05**	**0.23**
CE-02	2E	3.2E-03	0.01	3.1E-03	0.01	1.8E-03	0.01	2.9E-05	1.3E-04	0.03	0.14	---	---	3.6E-03	0.02	6.5E-04	2.8E-03	---	---	2.3E-04	9.9E-04	2.1E-04	9.1E-04	**0.05**	**0.20**
CE-03	3E	0.11	0.48	0.07	0.29	0.01	0.03	5.2E-04	2.3E-03	0.31	1.34	0.01	0.06	0.03	0.14	0.01	0.02	3.3E-03	0.01	2.4E-03	0.01	0.00	0.02	**0.55**	**2.41**
CE-04	4E	0.11	0.48	0.07	0.29	0.01	0.03	5.2E-04	2.3E-03	0.31	1.34	0.01	0.06	0.03	0.14	0.01	0.02	3.3E-03	0.01	2.4E-03	0.01	0.00	0.02	**0.55**	**2.41**
CE-05	5E	0.11	0.48	0.07	0.29	0.01	0.03	5.2E-04	2.3E-03	0.31	1.34	0.01	0.06	0.03	0.14	0.01	0.02	3.3E-03	0.01	2.4E-03	0.01	0.00	0.02	**0.55**	**2.41**
SSM	6E	---	---	---	---	---	0.00	---	0.00	---	---	---	0.13	---	---	---	0.00	---	0.00	---	0.00	---	---	**---**	**0.13**
RPC	7E	---	---	---	---	0.01	0.04	0.01	0.04	0.05	0.22	0.01	0.04	---	---	0.01	0.04	0.01	0.04	0.01	0.04	---	---	**0.10**	**0.44**
GE-01	8E	4.2E-03	1.1E-03	4.0E-03	9.9E-04	2.4E-03	6.0E-04	3.7E-05	9.4E-06	0.03	0.01	---	---	4.6E-03	1.2E-03	4.6E-03	2.1E-04	---	---	2.9E-04	7.4E-05	2.7E-04	6.8E-05	**0.05**	**0.01**
H-01	9E	---	---	---	---	2.3E-05	1.0E-04	---	---	8.2E-04	3.6E-03	0.02	0.09	---	---	3.7E-05	1.6E-04	---	---	---	---	1.3E-05	5.7E-05	**0.02**	**0.09**
H-02	10E	---	---	---	---	1.1E-05	4.7E-05	---	---	3.9E-04	1.7E-03	0.01	0.04	---	---	1.8E-05	7.7E-05	---	---	---	---	6.2E-06	2.7E-05	**0.01**	**0.04**
H-03	11E	---	---	---	---	1.5E-05	6.6E-05	---	---	5.4E-04	2.4E-03	0.01	0.06	---	---	2.4E-05	1.1E-04	---	---	---	---	8.6E-06	3.8E-05	**0.01**	**0.06**
H-04	12E	---	---	---	---	1.5E-05	6.6E-05	---	---	5.4E-04	2.4E-03	0.01	0.06	---	---	2.4E-05	1.1E-04	---	---	---	---	8.6E-06	3.8E-05	**0.01**	**0.06**
H-05	13E	---	---	---	---	4.8E-05	2.1E-04	---	---	1.7E-03	0.01	0.04	0.18	---	---	7.8E-05	3.4E-04	---	---	---	---	2.8E-05	1.2E-04	**0.04**	**0.19**
H-06	14E	---	---	---	---	4.8E-05	2.1E-04	---	---	1.7E-03	0.01	0.04	0.18	---	---	7.8E-05	3.4E-04	---	---	---	---	2.8E-05	1.2E-04	**0.04**	**0.19**
DH-01	15E	---	---	---	---	0.07	0.31	---	---	---	---	0.07	0.30	---	---	0.31	1.34	---	---	0.98	4.27	---	---	**1.42**	**6.22**
BLR-01	16E	---	---	---	---	4.6E-07	2.0E-06	---	---	1.6E-05	7.1E-05	3.9E-04	1.7E-03	---	---	7.4E-07	3.2E-06	---	---	---	---	2.6E-07	1.1E-06	**4.1E-04**	**1.8E-03**
FL-02	**18E**	---	---	---	---	0.01	1.6E-03	2.4E-03	3.0E-04	0.03	4.3E-03	0.92	0.12	---	---	0.02	0.00	---	---	0.00	0.00	5.4E-04	6.8E-05	**0.99**	**0.13**
TLO	20E	---	---	---	---	---	0.10	---	0.10	---	---	---	0.10	---	---	---	0.10	---	---	---	0.10	---	---	**---**	**0.49**
FUG	**21E**	---	---	---	---	**0.01**	**0.05**	**0.01**	**0.05**	---	---	**0.53**	**2.30**	---	---	**0.01**	**0.05**	---	---	**0.01**	**0.05**	---	---	**0.57**	**2.51**
T-03	22E	---	---	---	---	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	---	---	---	---	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 PTE:		**0.34**	**1.47**	**0.21**	**0.92**	**0.15**	**0.70**	**0.05**	**0.30**	**1.10**	**4.54**	**1.73**	**3.88**	**0.11**	**0.47**	**0.40**	**1.71**	**0.02**	**0.08**	**1.03**	**4.60**	**0.01**	**0.06**	**5.15**	**18.74**
NNSR/PSD:			**na**		**na**		**na**		**na**		**na**		**na**		**na**		**na**		**na**		**na**		**na**		**na**
TVOP:			**10**		**10**		**10**		**10**		**10**		**10**		**10**		**10**		**10**		**10**		**10**		**25**

Gray Shaded Cells Indicate Modified Data

Notes: 1 - Emissions are based on operation at 100% of rated load for 8,760 hrs/yr; except GE-01, TLO and SSM emissions are intermittent (and infrequent).

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

Greenhouse Gas (GHG) - Emissions Summary

Unit ID	Point ID	Description	Site Rating	Operating Hours	Heat Input		CO2 kg/MMBtu: 53.06 GWP: 1	CO2e	CH4 kg/MMBtu: 1.00E-03 GWP: 25	CO2e	N2O kg/MMBtu: 1.00E-04 GWP: 298	CO2e	TOTAL CO2e
				hr/yr	LHV MMBtu/hr	HHV MMBtu/hr	tpy	tpy	tpy	tpy	tpy	tpy	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	0.03	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	0.03	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	Start/Stop/Maintenance	na	8,760	---	---	---	---	164	4,094	---	---	**4,094**
RPC	7E	Rod Packing/Crankcase	na	8,760	---	---	371	371	180	4,511	---	---	**4,882**
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-02	**18E**	**New Process Flare (MODIFIED)**	90.0 MMscf/yr	8,760	11.92	13.25	7,150	7,150	34.06	852	0.04	13.34	**8,015**
TLO	20E	Truck Load-Out - Prod H2O/Condensate	600,000 bbl/yr	---	---	---	---	---	---	---	---	---	**---**
FUG	**21E**	**Process Piping Fugitives (MODIFIED)**	**24,550 Units**	8,760	---	---	---	---	**78**	**1,942**	---	---	**1,942**
T-03	22E	Produced Water Tank (9913)	400 bbl	8,760	---	---	---	---	---	---	---	---	**---**
T-04	23E	Produced Water Tank (9914)	400 bbl	8,760	---	---	---	---	---	---	---	---	**---**

Gray Shaded Cells Indicate Modified Data

TOTAL POINT SOURCE EMISSIONS:	**178.71**	**97,088**	**97,088**	**1,051**	**26,270**	**0.20**	**61**	**123,418**
NNSR/PSD Major Source Threshold:		**na**	**(OR)**	**na**	**(OR)**	**na**	**(AND)**	**na**
TVOP Major Source Threshold:		**na**		**na**		**na**		**100,000**

Notes: * Emission Units DH-01/15E and BLR-01/16E are authorized by Permit R13-3212A, issued 06/07/17; all other Emission Units are authorized by Permit R13-2826J, issued 06/16/16.

1 - Emissions shown are based on operation at 100% of rated load and capacity for 8,760 hrs/yr, except:

i. GE-01/8E potential to emit is based on 500 hr/yr (operation is unlimited during emergencies); and ii. SSM/6E and TLO/20E emissions are infrequent and intermittent.

2 - Engine CO2 and CH4 emissions are based on vendor specifications.

3 - Dehydrator CH4 emissions are based on "Worst Case" GRI-GLYCalc Model Output.

4 - SSM CH4 emissions are based on vendor specifications and operational experience.

5 - Fugitive CH4 emissions are based on EPA Fugitive Emission Factors for Oil and Gas Production Operations.

6 - All other GHG emissions are based on the most conservative values in either AP-42 or 40CFR98, Subpart C, Table C-1.

7 - CO2e is aggregated Greenhouse Gas (GHG), comprised of carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O), as adjusted for Global Warming Potential (GWP).

8 - GHG TVOP and NSR/PSD Major Source Thresholds are applicable only if other regulated air pollutants exceed the corresponding Thresholds.

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

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	0.20	0.88	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	2.52	11.06	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	2.52	11.06	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	2.52	11.06	4,523	19,813
SSM	6E	Start/Stop/Maintenance	na	---	---	---	---	---	9.57	---	---	---	0.00	---	0.17	---	5,617
RPC	7E	Rod Packing/Crankcase	na	---	---	---	---	2.81	12.29	0.05	0.22	0.01	0.04	0.10	0.44	1,115	4,882
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	2.7E-04	6.8E-05	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 Vent*	5.0 MMscfd	---	---	---	---	5.77	25.28	---	---	1.00	4.37	1.51	6.62	255	1,116
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-02	**18E**	**New Process Flare (MODIFIED)**	90.0 MMscf/yr	---	---	---	---	4,405.75	555.77	---	---	0.12	0.02	48.01	6.06	337,551	42,581
TLO	20E	Truck Load-Out - Prod H2O/Condensate	600,000 bbl/yr	---	---	---	---	---	1.96	---	---	---	0.10	---	0.49	---	---
FUG	**21E**	**Process Piping Fugitives (MODIFIED)**	**24,550**	---	---	---	---	**34.57**	**151.42**	---	---	**0.02**	**0.09**	**1.03**	**4.52**	**917**	**4,016**
T-03	22E	Produced Water Tank (9913)	400 bbl	---	---	---	---	0.23	1.01	---	---	0.01	0.05	0.06	0.25	---	---
T-04	23E	Produced Water Tank (9914)	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**	**4,472**	**857**	**6.45**	**28.14**	**1.19**	**4.79**	**58.88**	**54.14**	**363,723**	**162,134**
NNSR/PSD Threshold:					**250**		**250**		**250**		**na**		**na**		**na**		**na**
TVOP Threshold:					**100**		**100**		**100**		**10**		**10**		**25**		**100,000**

Notes: * Emission Units DH-01/15E and BLR-01/16E are authorized by Permit R13-3212A, issued 06/07/17; all other Emission Units are authorized by Permit R13-2826J, issued 06/16/16.

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

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

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/MMBtu	lb/hr	tpy		g/bhp-hr	lb/MMBtu	lb/hr	tpy
CE-01/1E	**Caterpillar (CAT) G342NA Engine 4SRB w/ NSCR**	Vendor Specs	NOx	12.90	3.02	6.40	28.03	99.2%	0.10	0.02	**0.05**	**0.22**
		Vendor Specs	CO	13.70	3.20	6.80	29.77	85.4%	2.00	0.47	**0.99**	**4.35**
		Vendor Specs	THC	1.80	0.42	0.89	3.91	---	1.80	0.42	**0.89**	**3.91**
		Est = 50% x THC	NMHC	0.90	0.21	0.45	1.96	---	0.90	0.21	**0.45**	**1.96**
		Vendor Specs	NMNEHC	0.50	0.12	0.25	1.09	---	0.50	0.12	**0.25**	**1.09**
	225 bhp	NMNEHC+HCHO	VOC	0.75	0.18	0.37	1.63	25.3%	0.56	0.13	**0.28**	**1.22**
	1,200 rpm	AP-42 Table 3.2-3	SO2	2.5E-03	5.9E-04	1.2E-03	0.01	---	2.5E-03	5.9E-04	**1.2E-03**	**0.01**
		AP-42 Table 3.2-3	PM10/2.5	0.08	0.02	0.04	0.18	---	0.08	0.02	**0.04**	**0.18**
	Manufacture Date:	AP-42 Table 3.2-3	Acetaldehyde	0.01	2.8E-03	5.9E-03	0.03	---	0.01	2.8E-03	**0.01**	**0.03**
	Before 06/12/06	AP-42 Table 3.2-3	Acrolein	0.01	2.6E-03	5.6E-03	0.02	---	0.01	2.6E-03	**0.01**	**0.02**
	NESHAP ZZZZ (Existing)	AP-42 Table 3.2-3	Benzene	0.01	1.6E-03	3.4E-03	0.01	---	0.01	1.6E-03	**3.4E-03**	**0.01**
		AP-42 Table 3.2-3	Ethylbenzene	1.1E-04	2.5E-05	5.3E-05	2.3E-04	---	1.1E-04	2.5E-05	**5.3E-05**	**2.3E-04**
	8,760 hr/yr	Vendor Specs (Est.)	Formaldehyde	0.25	0.06	0.12	0.54	76.0%	0.06	0.01	**0.03**	**0.13**
		AP-42 Table 3.2-3	n-Hexane	---	---	---	---	---	---	---	**---**	**---**
	8,500 Btu/bhp-hr (LHV)	AP-42 Table 3.2-3	Methanol	1.3E-02	3.1E-03	6.5E-03	0.03	---	1.3E-02	3.1E-03	**0.01**	**0.03**
	9,424 Btu/bhp-hr (HHV)	AP-42 Table 3.2-3	Toluene	2.4E-03	5.6E-04	1.2E-03	0.01	---	2.4E-03	5.6E-04	**1.2E-03**	**0.01**
	1.91 MMBtu/hr (LHV)	AP-42 Table 3.2-3	2,2,4-TMP	---	---	---	---	---	---	---	**---**	**---**
	2.12 MMBtu/hr (HHV)	AP-42 Table 3.2-3	Xylenes	8.3E-04	2.0E-04	4.1E-04	1.8E-03	---	8.3E-04	2.0E-04	**4.1E-04**	**1.8E-03**
	16,754 MMBtu/yr (LHV)	AP-42 Table 3.2-3	Other HAPs	7.7E-04	1.8E-04	3.8E-04	0.00	---	7.7E-04	1.8E-04	**3.8E-04**	**0.00**
	2,079 scf/hr	Sum	Total HAP	0.30	0.07	0.15	0.65	64.0%	0.11	0.03	**0.05**	**0.23**
	18.21 MMscf/yr	40CFR98 - Table C-1	CO2	503	118	249	1,093	---	503	118	**249**	**1,093**
	920 Btu/scf (LHV)	Vendor Specs (THC)	CH4	1.80	0.42	0.89	3.91	---	1.80	0.42	**0.89**	**3.91**
	1,020 Btu/scf (HHV)	40CFR98 - Table C-2	N2O	9.4E-04	2.2E-04	4.7E-04	2.0E-03	---	9.4E-04	2.2E-04	**4.7E-04**	**2.0E-03**
		Weighted Sum	CO2e	548	128	272	1,191	---	548	128	**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

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

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/MMBtu	lb/hr	tpy		g/bhp-hr	lb/MMBtu	lb/hr	tpy
CE-02/2E	**Caterpillar (CAT) G398TA Engine 4SRB w/ NSCR**	Vendor Specs	NOx	9.80	2.32	13.50	59.14	94.9%	0.50	0.12	**0.69**	**3.02**
		Vendor Specs	CO	10.70	2.54	14.74	64.58	95.3%	0.50	0.12	**0.69**	**3.04**
		Vendor Specs	THC	0.80	0.19	1.10	4.83	20.0%	0.64	0.15	**0.88**	**3.86**
		Est = 50% x THC	NMHC	0.40	0.09	0.55	2.41	10.0%	0.32	0.09	**0.44**	**1.93**
		Vendor Specs	NMNEHC	0.20	0.05	0.28	1.21	80.0%	0.04	0.01	**0.06**	**0.24**
	625 bhp	NMNEHC+HCHO	VOC	0.30	0.07	0.41	1.81	78.7%	0.06	0.02	**0.09**	**0.39**
	1,200 rpm	AP-42 Table 3.2-3	SO2	2.5E-03	5.9E-04	3.4E-03	0.01	---	2.5E-03	5.9E-04	**3.4E-03**	**0.01**
		AP-42 Table 3.2-3	PM10/2.5	0.08	0.02	0.11	0.49	---	0.08	0.02	**0.11**	**0.49**
	Manufacture Date:	AP-42 Table 3.2-3	Acetaldehyde	0.01	2.8E-03	0.02	0.07	80.0%	0.00	5.6E-04	**3.2E-03**	**0.01**
	Before 06/12/06	AP-42 Table 3.2-3	Acrolein	0.01	2.6E-03	0.02	0.07	80.0%	0.00	5.3E-04	**3.1E-03**	**0.01**
	NESHAP ZZZZ (Existing)	AP-42 Table 3.2-3	Benzene	0.01	1.6E-03	0.01	0.04	80.0%	1.3E-03	3.2E-04	**1.8E-03**	**0.01**
		AP-42 Table 3.2-3	Ethylbenzene	1.0E-04	2.5E-05	1.4E-04	6.3E-04	80.0%	2.1E-05	5.0E-06	**2.9E-05**	**1.3E-04**
	8,760 hr/yr	Vendor Specs (Est.)	Formaldehyde	0.10	0.02	0.14	0.60	76.0%	0.02	0.01	**0.03**	**0.14**
		AP-42 Table 3.2-3	n-Hexane	---	---	---	---	80.0%	---	---	**---**	**---**
	8,387 Btu/bhp-hr (LHV)	AP-42 Table 3.2-3	Methanol	0.01	3.1E-03	0.02	0.08	80.0%	2.6E-03	6.1E-04	**3.6E-03**	**0.02**
	9,299 Btu/bhp-hr (HHV)	AP-42 Table 3.2-3	Toluene	2.4E-03	5.6E-04	3.2E-03	0.01	80.0%	4.7E-04	1.1E-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	2.0E-04	1.1E-03	5.0E-03	80.0%	1.6E-04	3.9E-05	**2.3E-04**	**9.9E-04**
	45,919 MMBtu/yr (LHV)	AP-42 Table 3.2-3	Other HAPs	7.6E-04	1.8E-04	0.00	0.00	80.0%	1.5E-04	3.6E-05	**2.1E-04**	**9.1E-04**
	5,698 scf/hr	Sum	Total HAP	0.15	0.03	0.20	0.88	77.3%	0.03	0.01	**0.05**	**0.20**
	49.91 MMscf/yr	40CFR98 - Table C-1	CO2	496	118	684	2,995	---	496	118	**684**	**2,995**
	920 Btu/scf (LHV)	Vendor Specs (THC)	CH4	0.80	0.19	1.10	4.83	---	0.80	0.19	**1.10**	**4.83**
	1,020 Btu/scf (HHV)	40CFR98 - Table C-2	N2O	9.3E-04	2.2E-04	1.3E-03	0.01	---	9.3E-04	2.2E-04	**1.3E-03**	**0.01**
		Weighted Sum	CO2e	516	122	712	3,117	---	516	122	**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

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

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/MMBtu	lb/hr	tpy		g/bhp-hr	lb/MMBtu	lb/hr	tpy
CE-03/3E CE-04/4E CE-05/5E	**Caterpillar (CAT) G3612LE Engine 4SLB w/ OxCat** **3,550 bhp (Each)** 1,000 rpm Commenced Construction After 06/12/06 NESHAP ZZZZ (New) **8,760 hr/yr (Each)** 6,629 Btu/bhp-hr (LHV) 7,350 Btu/bhp-hr (HHV) 23.53 MMBtu/hr (LHV) 26.09 MMBtu/hr (HHV) 206,149 MMBtu/yr (LHV) 25,579 scf/hr 224.07 MMscf/yr 920 Btu/scf (LHV) 1,020 Btu/scf (HHV)	Vendor Specs	NOx	0.50	0.15	3.91	17.14	0.0%	0.50	0.15	**3.91**	**17.14**
		Vendor Specs	CO	2.75	0.82	21.52	94.27	90.0%	0.28	0.08	**2.15**	**9.43**
		Vendor Specs	THC	6.46	1.94	50.56	221.45	5.0%	6.14	1.84	**48.02**	**210.31**
		Vendor Specs	NMHC	1.82	0.55	14.24	62.39	17.9%	1.50	0.45	**11.70**	**51.25**
		Vendor Specs	NMNEHC	0.65	0.19	5.09	22.28	50.0%	0.33	0.10	**2.54**	**11.14**
		NMNEHC+HCHO	VOC	0.91	0.27	7.12	31.19	60.0%	0.36	0.11	**2.85**	**12.48**
		AP-42 Table 3.2-2	SO2	2.0E-03	5.88E-04	0.02	0.07	---	2.0E-03	5.9E-04	**0.02**	**0.07**
		AP-42 Table 3.2-2	PM10/2.5	0.03	0.01	0.26	1.14	---	0.03	0.01	**0.26**	**1.14**
		AP-42 Table 3.2-2	Acetaldehyde	0.03	0.01	0.22	0.96	50.0%	0.01	4.2E-03	**0.11**	**0.48**
		AP-42 Table 3.2-2	Acrolein	0.02	0.01	0.13	0.59	50.0%	0.01	2.6E-03	**0.07**	**0.29**
		AP-42 Table 3.2-2	Benzene	1.5E-03	4.40E-04	0.01	0.05	50.0%	7.3E-04	2.2E-04	**0.01**	**0.03**
		AP-42 Table 3.2-2	Ethylbenzene	1.3E-04	3.97E-05	1.0E-03	4.5E-03	50.0%	6.6E-05	2.0E-05	**5.2E-04**	**2.3E-03**
		Vendor Specs	Formaldehyde	0.26	0.08	2.03	8.91	85.0%	0.04	0.01	**0.31**	**1.34**
		AP-42 Table 3.2-2	n-Hexane	3.7E-03	1.11E-03	0.03	0.13	50.0%	1.9E-03	5.6E-04	**0.01**	**0.06**
		AP-42 Table 3.2-2	Methanol	0.01	2.50E-03	0.07	0.29	50.0%	4.2E-03	1.3E-03	**0.03**	**0.14**
		AP-42 Table 3.2-2	Toluene	1.4E-03	4.08E-04	0.01	0.05	50.0%	6.8E-04	2.0E-04	**0.01**	**0.02**
		AP-42 Table 3.2-2	2,2,4-TMP	8.3E-04	2.50E-04	0.01	0.03	50.0%	4.2E-04	1.3E-04	**3.3E-03**	**0.01**
		AP-42 Table 3.2-2	Xylenes	6.1E-04	1.84E-04	4.8E-03	0.02	50.0%	3.1E-04	9.2E-05	**2.4E-03**	**0.01**
		AP-42 Table 3.2-2	Other HAPs	1.1E-03	3.21E-04	0.01	0.04	50.0%	5.3E-04	1.6E-04	**0.00**	**0.02**
		Sum	Total HAP	0.32	0.10	2.52	11.06	78.2%	0.07	0.02	**0.55**	**2.41**
		Vendor Specs	CO2	441	132.29	3,451	15,117	---	441	132	**3,451**	**15,117**
		Vendor Specs	CH4	5.47	1.64	42.81	187.51	---	5.47	1.64	**42.81**	**187.51**
		40CFR98 - Table C-2	N2O	7.3E-04	2.20E-04	0.01	0.03	---	7.3E-04	2.2E-04	**0.01**	**0.03**
		Weighted Sum	CO2e	578	173	4,523	19,813	---	578	173	**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

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

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

Unit		No of Comp-ressor 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	VOC 13,521 (Inlet) 926 (Residue) lb/MMscf tpy	n-Hexane 141 (Inlet) 21 (Residue) lb/MMscf tpy	BTEX,TMP 1 (Inlet) 0 (Residue) lb/MMscf tpy	Total HAP 148 (Inlet) 22 (Residue) lb/MMscf tpy	CH4 37,259 (Inlet) 42,275 (Residue) lb/MMscf tpy	CO2e GWP = 25 tpy
CE-01 and CE-02	a. Cold Start (Engines)	2	na	1,400	na	104	0.15	0.98	0.01	9.9E-05	0.01	2.7	68
	b. Blowdown (Recip Comp)	2	850	na	5,283	104	0.55	3.71	0.04	3.7E-04	0.04	10.2	256
CE-03 thru CE-05	a. Cold Start (Engines)	3	na	2,100	na	104	0.22	0.10	0.00	3.4E-05	2.4E-03	4.6	115
	b. Blowdown (Recip Comp)	3	10,650	na	66,192	104	6.88	3.19	0.07	1.1E-03	0.08	145.5	3,638
CM-01	a. Cold Start (Electric Motor)	na	na	na	na	na	na	na	na	na	na	na	na
	b. Blowdown (Recip Comp)	1	500	na	3,108	12	0.04	0.25	0.00	2.5E-05	2.8E-03	0.7	17
CM-02 thru CM-07	a. Cold Start (Electric Motor)	na	na	na	na	na	na	na	na	na	na	na	na
	b. Blowdown (Recip Comp)	6	38,630	na	240,094	12	2.88	1.33	0.03	4.5E-04	0.03	60.9	1,522
TOTAL FACILITY-WIDE PRE-CONTROLLED SSM EMISSIONS:								**9.57**	**0.16**	**0.00**	**0.17**	**225**	**5,617**
BLOWDOWN EMISSIONS FROM CM-02 THRU CM-07 INCLUDED IN NEW FLARE (FL-02/18E):								(1.33)	(0.03)	(0.00)	(0.03)	(60.90)	(1,522)
TOTAL FACILITY-WIDE CONTROLLED SSM EMISSIONS:								**8.24**	**0.13**	**0.00**	**0.13**	**164**	**4,094**

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	262.62 lb/MMscf	203.37 lb/MMscf	244.04 lb/MMscf
Methane	31,049.14 lb/MMscf	37,258.97 lb/MMscf	35,798.08 lb/MMscf	42,275.00 lb/MMscf
VOC (Propane)	11,267.63 lb/MMscf	13,521.16 lb/MMscf	771.50 lb/MMscf	925.80 lb/MMscf
n-Hexane	117.63 lb/MMscf	141.16 lb/MMscf	17.34 lb/MMscf	20.81 lb/MMscf
Benzene	1.65 lb/MMscf	1.98 lb/MMscf	0.21 lb/MMscf	0.25 lb/MMscf
Toluene	3.16 lb/MMscf	3.79 lb/MMscf	0.24 lb/MMscf	0.29 lb/MMscf
Ethylbenzene	0.28 lb/MMscf	0.34 lb/MMscf	0.28 lb/MMscf	0.34 lb/MMscf
Xylenes	0.28 lb/MMscf	0.34 lb/MMscf	0.28 lb/MMscf	0.34 lb/MMscf
2,2,4-TMP	0.30 lb/MMscf	0.36 lb/MMscf	0.30 lb/MMscf	0.36 lb/MMscf
Total HAP:	123.30 lb/MMscf	147.96 lb/MMscf	18.65 lb/MMscf	22.38 lb/MMscf

5 - Emission estimates are conservatively based on:

2.0	Starts-Stops per week per Engine.
2.0	Blowdown(s) per week per Compressor (except electrically driven compressors, see above).

6 - CE-01, CE-02, and CM-01 are in Inlet Gas service. CE-03 thru CE-05 and CM-02 thru CM-07 are in Residue Gas service.

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

Compressor Rod Packing Leaks (Natural Gas)

Unit Description	No. of Recip Comp-ressors	Cyl per Recip Comp-ressor	scfh per Cylinder	Contin-gency	Total Leak Rate	VOC 13,521 (Inlet) 926 (Residue) lb/MMscf		HCHO na na lb/MMscf		BTEX,Hex,TMP(Ea) 25 (Inlet) 4 (*Residue) lb/MMscf		Total HAP 148 (Inlet) 22 (*Residue) lb/MMscf		CO2 263 (Inlet) 244 (Residue) lb/MMscf		CH4 37,259 (Inlet) 42,275 (Residue) lb/MMscf		CO2e 931,737 (Inlet) 1,057,119 (Residue) lb/MMscf	
					MMscf/yr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Rod Packing - CM-01(Inlet)	1	2	15	15%	0.30	0.47	2.04	na	na	8.5E-04	0.00	0.01	0.02	0.01	0.04	1	6	32	141
Rod Packing - CE-04 (inlet)	1	4	15	15%	0.60	0.93	4.09	na	na	0.00	0.01	0.01	0.04	0.02	0.08	3	11	64	282
Rod Packing - CE-05 (Inlet)	1	2	15	15%	0.30	0.47	2.04	na	na	8.5E-04	0.00	0.01	0.02	0.01	0.04	1	6	32	141
Rod Packing* - CM-02 thru -07	6	6	15	15%	5.44	0.57	2.52	na	na	0.00	0.01	0.01	0.06	0.15	0.66	26	115	656	2,875
Rod Packing* - CE-01 thru -03	3	4	15	15%	1.81	0.19	0.84	na	na	0.00	0.00	0.00	0.02	0.05	0.22	9	38	219	958

*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 12.13 lb/MMscf		HCHO 3.47 lb/MMscf		BTEX,Hex,TMP(Ea) 0.14 lb/MMscf		Total HAP 4.30 lb/MMscf		CO2 5,879 lb/MMscf		CH4 73 lb/MMscf		CO2e 7,702 lb/MMscf	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Crankcase Emissions**	11,500	50.37	250%	0.17	0.76	0.05	0.22	2.0E-03	0.01	0.06	0.27	85	370	1	5	111	485

**Crankcase - CE-01 thru -05

CM-01 thru CM-07 are Electric Motor Driven Compressors.
CE-01 thru CE-05 are Gas-Fired Engine Driven Compressors.

	VOC		HCHO		BTEX,Hex,TMP(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
Total RPC:	**2.81**	**12.29**	**0.05**	**0.22**	**0.01**	**0.04**	**0.10**	**0.44**	**85**	**371**	**41**	**180**	**1,115**	**4,882**

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	263 lb/MMscf	244 lb/MMscf
CH4	37,259 lb/MMscf	42,275 lb/MMscf
VOC	13,521 lb/MMscf	926 lb/MMscf
BTEX,Hex,TMP (ea)	25 lb/MMscf	4 lb/MMscf
Total HAP	148 lb/MMscf	22 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	0.36	tpy BTEX	0.14	lb BTEX / MMscf TEEx
Crankcase HAP (tot) emissions (Mas	11.06	tpy HAP	4.30	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) (MMsfy/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

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

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/MMBtu	lb/hr	tpy		g/bhp-hr	lb/MMBtu	lb/hr	tpy
GE-01/8E	**Olympian G70LG (4SRB) 4SRB - EPA Certified**	Vendor Data	NOx	3.55	0.92	0.93	0.23	---	3.55	0.92	**0.93**	**0.23**
		Vendor Data	CO	111.49	28.92	29.10	7.28	---	111.49	28.92	**29.10**	**7.28**
		Vendor Data	THC	1.46	0.38	0.38	0.10	---	1.46	0.38	**0.38**	**0.10**
		Conservative Est.	NMHC	1.46	0.38	0.38	0.10	---	1.46	0.38	**0.38**	**0.10**
	118 bhp	Conservative Est.	NMNEHC	1.46	0.38	0.38	0.10	---	1.46	0.38	**0.38**	**0.10**
	1,800 rpm	Conservative Est.	VOC	1.46	0.38	0.38	0.10	---	1.46	0.38	**0.38**	**0.10**
		AP-42 Table 3.2-3	SO2	2.3E-03	5.88E-04	8.9E-04	2.2E-04	---	2.3E-03	5.88E-04	**8.9E-04**	**2.2E-04**
	Manufacture Date:	AP-42 Table 3.2-3	PM10/2.5	0.07	0.02	0.03	0.01	---	0.07	0.02	**0.03**	**0.01**
	After 01/01/09	AP-42 Table 3.2-3	Acetaldehyde	0.01	2.79E-03	4.2E-03	1.1E-03	---	0.01	2.79E-03	**4.2E-03**	**1.1E-03**
	NSPS Affected	AP-42 Table 3.2-3	Acrolein	0.01	2.63E-03	4.0E-03	9.9E-04	---	0.01	2.63E-03	**4.0E-03**	**9.9E-04**
	NESHAP ZZZZ (New)	AP-42 Table 3.2-3	Benzene	0.01	1.58E-03	2.4E-03	6.0E-04	---	0.01	1.58E-03	**2.4E-03**	**6.0E-04**
		AP-42 Table 3.2-3	Ethylbenzene	9.6E-05	2.48E-05	3.7E-05	9.4E-06	---	9.6E-05	2.48E-05	**3.7E-05**	**9.4E-06**
	500 hr/yr	AP-42 Table 3.2-3	Formaldehyde	0.08	0.02	0.03	0.01	---	0.08	0.02	**0.03**	**0.01**
		AP-42 Table 3.2-3	n-Hexane	---	---	---	---	---	---	---	**---**	**---**
	7,650 Btu/bhp-hr (LHV)	AP-42 Table 3.2-3	Methanol	0.01	3.06E-03	4.6E-03	1.2E-03	---	0.01	3.06E-03	**4.6E-03**	**1.2E-03**
	8,500 Btu/bhp-hr (HHV)	AP-42 Table 3.2-3	Toluene	2.2E-03	5.58E-04	8.4E-04	2.1E-04	---	2.2E-03	5.58E-04	**8.4E-04**	**2.1E-04**
	0.91 MMBtu/hr (LHV)	AP-42 Table 3.2-3	2,2,4-TMP	---	---	---	---	---	---	---	**---**	**---**
	1.01 MMBtu/hr (HHV)	AP-42 Table 3.2-3	Xylenes	7.5E-04	1.95E-04	2.9E-04	7.4E-05	---	7.5E-04	1.95E-04	**2.9E-04**	**7.4E-05**
	453 MMBtu/yr (LHV)	AP-42 Table 3.2-3	Other HAPs	6.9E-04	1.79E-04	2.7E-04	6.8E-05	---	6.9E-04	1.79E-04	**2.7E-04**	**6.8E-05**
	985 scf/hr	Sum	Total HAP	0.12	0.03	0.05	0.01	---	0.12	0.03	**0.05**	**0.01**
	0.49 MMscf/yr	40CFR98 Table C-1	CO2	522	135	136	34	---	522	135.46	**136**	**34**
	920 Btu/scf (LHV)	AP-42 Table 3.2-3	CH4	4.82	1.25	1.26	0.31	---	4.82	1.25	**1.26**	**0.31**
	1,020 Btu/scf (HHV)	40CFR98 Table C-1	N2O	0.01	1.32E-03	1.3E-03	3.3E-04	---	0.01	1.3E-03	**1.3E-03**	**3.3E-04**
		Weighted Sum	CO2e	644	167	168	42	---	644	167	**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

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

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)** **8,760 hr/yr** 10,870 scf/hr 260.87 Mscfd 95.22 MMscf/yr 920 Btu/scf (LHV) 1,020 Btu/scf (HHV)	EPA AP-42 Table 1.4-2	NOx	100.00	9.80E-02	1.09	4.76	---	**1.09**	**4.76**
		EPA AP-42 Table 1.4-2	CO	84.00	8.24E-02	0.91	4.00	---	**0.91**	**4.00**
		EPA AP-42 Table 1.4-2	THC	11.00	1.08E-02	0.12	0.52	---	**0.12**	**0.52**
		EPA AP-42 Table 1.4-2	NMHC	8.75	1.20E-01	1.33	5.83	---	**1.33**	**5.83**
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	5.32E-03	0.06	0.26	---	**0.06**	**0.26**
		EPA AP-42 Table 1.4-2	VOC	5.50	5.39E-03	0.06	0.26	---	**0.06**	**0.26**
		EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	0.01	0.03	---	**0.01**	**0.03**
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	7.45E-03	0.08	0.36	---	**0.08**	**0.36**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	2.1E-03	2.06E-06	2.3E-05	1.0E-04	---	**2.3E-05**	**1.0E-04**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	0.08	7.35E-05	8.2E-04	3.6E-03	---	**8.2E-04**	**3.6E-03**
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	0.02	0.09	---	**0.02**	**0.09**
		EPA AP-42 Table 1.4-3	Methanol	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Toluene	3.4E-03	3.33E-06	3.7E-05	1.6E-04	---	**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 HAPs	1.2E-03	1.18E-06	1.3E-05	5.7E-05	---	**1.3E-05**	**5.7E-05**
		EPA AP-42 Table 1.4-3	Total HAP	1.88	1.84E-03	0.02	0.09	---	**0.02**	**0.09**
		40CFR98 - Table C-1	CO2	119,317	1.17E+02	1,297	5,681	---	**1,297**	**5,681**
		40CFR98 - Table C-2	CH4	2.25	2.20E-03	0.02	0.11	---	**0.02**	**0.11**
		40CFR98 - Table C-2	N2O	0.22	2.20E-04	2.4E-03	0.01	---	**2.4E-03**	**0.01**
		Weighted Sum	CO2e	119,440	1.17E+02	1,298	5,686	---	**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

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

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	9.80E-02	0.52	2.26	---	**0.52**	**2.26**
		EPA AP-42 Table 1.4-2	CO	84.00	8.24E-02	0.43	1.90	---	**0.43**	**1.90**
		EPA AP-42 Table 1.4-2	THC	11.00	1.08E-02	0.06	0.25	---	**0.06**	**0.25**
		EPA AP-42 Table 1.4-2	NMHC	8.75	1.20E-01	0.63	2.76	---	**0.63**	**2.76**
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	5.32E-03	0.03	0.12	---	**0.03**	**0.12**
		EPA AP-42 Table 1.4-2	VOC	5.50	5.39E-03	0.03	0.12	---	**0.03**	**0.12**
		EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	3.1E-03	0.01	---	**0.00**	**0.01**
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	7.45E-03	0.04	0.17	---	**0.04**	**0.17**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	2.1E-03	2.06E-06	1.1E-05	4.7E-05	---	**1.1E-05**	**4.7E-05**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	0.08	7.35E-05	3.9E-04	1.7E-03	---	**3.9E-04**	**1.7E-03**
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	0.01	0.04	---	**0.01**	**0.04**
		EPA AP-42 Table 1.4-3	Methanol	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Toluene	3.4E-03	3.33E-06	1.8E-05	7.7E-05	---	**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 HAPs	1.2E-03	1.18E-06	6.2E-06	2.7E-05	---	**6.2E-06**	**2.7E-05**
		EPA AP-42 Table 1.4-3	Total HAP	1.88	1.84E-03	0.01	0.04	---	**0.01**	**0.04**
		40CFR98 - Table C-1	CO2	119,317	1.17E+02	615	2,693	---	**615**	**2,693**
		40CFR98 - Table C-2	CH4	2.25	2.20E-03	0.01	0.05	---	**0.01**	**0.05**
		40CFR98 - Table C-2	N2O	0.22	2.20E-04	1.2E-03	0.01	---	**1.2E-03**	**0.01**
		Weighted Sum	CO2e	119,440	1.17E+02	615	2,695	---	**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.

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	9.80E-02	0.72	3.14	---	**0.72**	**3.14**
		EPA AP-42 Table 1.4-2	CO	84.00	8.24E-02	0.60	2.64	---	**0.60**	**2.64**
		EPA AP-42 Table 1.4-2	THC	11.00	1.08E-02	0.08	0.35	---	**0.08**	**0.35**
		EPA AP-42 Table 1.4-2	NMHC	8.75	1.20E-01	0.88	3.85	---	**0.88**	**3.85**
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	5.32E-03	0.04	0.17	---	**0.04**	**0.17**
	6.60 MMBtu/hr (LHV) (ea)	EPA AP-42 Table 1.4-2	VOC	5.50	5.39E-03	0.04	0.17	---	**0.04**	**0.17**
	7.32 MMBtu/hr (HHV) (ea)	EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	4.3E-03	0.02	---	**4.3E-03**	**0.02**
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	7.45E-03	0.05	0.24	---	**0.05**	**0.24**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	---	---	---	**---**	**---**
	8,760 hr/yr	EPA AP-42 Table 1.4-3	Acrolein	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	2.1E-03	2.06E-06	1.5E-05	6.6E-05	---	**1.5E-05**	**6.6E-05**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	0.08	7.35E-05	5.4E-04	2.4E-03	---	**5.4E-04**	**2.4E-03**
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	0.01	0.06	---	**0.01**	**0.06**
	7,174 scf/hr	EPA AP-42 Table 1.4-3	Methanol	---	---	---	---	---	**---**	**---**
	172.17 Mscfd	EPA AP-42 Table 1.4-3	Toluene	3.4E-03	3.33E-06	2.4E-05	1.1E-04	---	**2.4E-05**	**1.1E-04**
	62.84 MMscf/yr	EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Xylenes	---	---	---	---	---	**---**	**---**
	920 Btu/scf (LHV)	EPA AP-42 Table 1.4-3	Other HAPs	1.2E-03	1.18E-06	8.6E-06	3.8E-05	---	**8.6E-06**	**3.8E-05**
	1,020 Btu/scf (HHV)	EPA AP-42 Table 1.4-3	Total HAP	1.88	1.84E-03	0.01	0.06	---	**0.01**	**0.06**
		40CFR98 - Table C-1	CO2	119,317	1.17E+02	856	3,749	---	**856**	**3,749**
		40CFR98 - Table C-2	CH4	2.25	2.20E-03	0.02	0.07	---	**0.02**	**0.07**
		40CFR98 - Table C-2	N2O	0.22	2.20E-04	1.6E-03	0.01	---	**1.6E-03**	**0.01**
		40CFR98 - Table A-1	CO2e	119,440	1.17E+02	857	3,753	---	**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.

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**	EPA AP-42 Table 1.4-2	NOx	100.00	9.80E-02	2.31	10.10	na	**2.31**	**10.10**
		EPA AP-42 Table 1.4-2	CO	84.00	8.24E-02	1.94	8.49	na	**1.94**	**8.49**
		EPA AP-42 Table 1.4-2	THC	11.00	1.08E-02	0.25	1.11	na	**0.25**	**1.11**
		EPA AP-42 Table 1.4-2	NMHC	8.75	1.20E-01	2.82	12.37	na	**2.82**	**12.37**
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	5.32E-03	0.13	0.55	na	**0.13**	**0.55**
	21.22 MMBtu/hr (LHV) (ea)	EPA AP-42 Table 1.4-2	VOC	5.50	5.39E-03	0.13	0.56	na	**0.13**	**0.56**
	23.53 MMBtu/hr (HHV) (ea)	EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	1.4E-02	0.06	na	**1.4E-02**	**0.06**
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	7.45E-03	0.18	0.77	na	**0.18**	**0.77**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	---	---	na	---	---
	8,760 hr/yr	EPA AP-42 Table 1.4-3	Acrolein	---	---	---	---	na	---	---
		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	Formaldehyde	0.08	7.35E-05	1.7E-03	0.01	na	**1.7E-03**	**0.01**
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	0.04	0.18	na	**0.04**	**0.18**
	23,065 scf/hr	EPA AP-42 Table 1.4-3	Methanol	---	---	---	---	---	---	---
	553.57 Mscfd	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**
	202.05 MMscf/yr	EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Xylenes	---	---	---	---	---	**---**	**---**
	920 Btu/scf (LHV)	EPA AP-42 Table 1.4-3	Other HAPs	1.2E-03	1.18E-06	2.8E-05	1.2E-04	na	**2.8E-05**	**1.2E-04**
	1,020 Btu/scf (HHV)	EPA AP-42 Table 1.4-3	Total HAP	1.88	1.84E-03	0.04	0.19	---	**0.04**	**0.19**
		40CFR98 - Table C-1	CO2	119,317	1.17E+02	2,752	12,054	na	**2,752**	**12,054**
		40CFR98 - Table C-2	CH4	2.25	2.20E-03	0.05	0.23	na	**0.05**	**0.23**
		40CFR98 - Table C-2	N2O	0.22	2.20E-04	0.01	0.02	na	**0.01**	**0.02**
		40CFR98 - Table A-1	CO2e	119,440	1.17E+02	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.

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

Authorized by R13-3212A - Groves Dehydration Station

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)** 5.00 MMscfd 8,760 hr/yr 0.21 MMscf/hr 1,825 MMscf/yr NESHAP HH - Exempt	See BLR-01	NOx	---	---	---	---	---	**---**	**---**
		See BLR-01	CO	---	---	---	---	---	**---**	**---**
		GRI-GLYCalc 4.0	THC	---	---	19.75	86.49	45%	**10.96**	**48.00**
		GRI-GLYCalc 4.0	NMHC	---	---	9.56	41.85	39%	**5.82**	**25.51**
		GRI-GLYCalc 4.0	NMNEHC	---	---	5.77	25.28	33%	**3.88**	**17.00**
		GRI-GLYCalc 4.0	VOC	---	---	5.77	25.28	33%	**3.88**	**17.00**
		See BLR-01	SO2	---	---	---	---	---	**---**	**---**
		See BLR-01	PM10/2.5	---	---	---	---	---	**---**	**---**
		See BLR-01	Acetaldehyde	---	---	---	---	---	---	---
		See BLR-01	Acrolein	---	---	---	---	---	---	---
		GRI-GLYCalc 4.0	Benzene	---	---	0.08	0.34	7%	**0.07**	**0.31**
		GRI-GLYCalc 4.0	Ethylbenzene	---	---	---	---	---	**---**	**---**
		See BLR-01	Formaldehyde	---	---	---	---	---	**---**	**---**
		GRI-GLYCalc 4.0	n-Hexane	---	---	0.11	0.50	40%	**0.07**	**0.30**
		See BLR-01	Methanol	---	---	---	---	---	---	---
		GRI-GLYCalc 4.0	Toluene	---	---	0.32	1.41	5%	**0.31**	**1.34**
		GRI-GLYCalc 4.0	2,2,4-TMP	---	---	---	---	---	**---**	**---**
		GRI-GLYCalc 4.0	Xylenes	---	---	1.00	4.37	2%	**0.98**	**4.27**
		See BLR-01	Other HAPs	---	---	---	---	---	**---**	**---**
		GRI-GLYCalc 4.0	Total HAP	---	---	1.51	6.62	6%	**1.42**	**6.22**
		See BLR-01	CO2	---	---	---	---	---	**---**	**---**
		GRI-GLYCalc 4.0	CH4	---	---	10.19	44.63	50%	**5.14**	**22.50**
		See BLR-01	N2O	---	---	---	---	---	**---**	**---**
		40CFR98 - Table A-1	CO2e	---	---	255	1,116	50%	**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:

	GRI-GLYCalc 4.0*	Worst-Case Assumption
THC	40.00 tpy	48.00 tpy
NMHC	21.25 tpy	25.51 tpy
NMNEHC = VOC	14.16 tpy	17.00 tpy
Benzene	0.26 tpy	0.31 tpy
Ethylbenzene	--- tpy	--- tpy
HCHO	--- tpy	--- tpy
n-Hexane	0.25 tpy	0.30 tpy
Toluene	1.11 tpy	1.34 tpy
2,2,4-TMP	--- tpy	--- tpy
Xylenes	3.56 tpy	4.27 tpy
Total HAP	5.19 tpy	6.22 tpy
CH4	18.75 tpy	22.50 tpy

***Dehydrator Operating Parameters (See Attachment L)**

Flow Rate:	5.0 gal/lb-H2O	Gas Analysis:	07/02/13
Wet Gas Temperature:	72 oF	Flash Tank Temperature:	150 oF
Wet Gas Presssure:	836 psig	Flash Tank Pressure:	50 psig
Wet Gas Water Content:	Saturated	Flash Tank Off-Gas Control:	50% Recycle
Dry Gas Water Content:)	lb-H2O/MMscf	Stripping Gas:	na
Lean Glycol Water Content:	1.5 wt% H2O	Condenser Temperature:	na
Glycol Circulation Rate:	0.67 gpm	Condenser Pressure:	na
Glycol Pump:	Gas Injection	Regen/Cond Off-Gas Control:	na

Additional Model Results:

Glycol Recirculation Ratio:	7.1 gal/lb-H2O	Flash Tank Off-Gas Flow:	262 scfh
Rich Glycol Water Content:	2.8 gal/lb-H2O	Regen/Cond Off-Gas Flow:	128 scfh

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

Authorized by R13-3212A - Groves Dehydration Station

Unit ID	Description	Reference	Pollutant	Emission Factor		Pre-Controlled Emissions		Control Efficiency	Controlled Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy	%	lb/hr	tpy
BLR-01/16E	**Reboiler 01 (Combustion Only)** **0.20 MMBtu/hr (LHV)** **0.22 MMBtu/hr (HHV)** **8,760 hr/yr** 217 scf/hr 5.22 Mscfd 1.90 MMscf/yr 920 Btu/scf (LHV) 1,020 Btu/scf (HHV)	EPA AP-42 Table 1.4-2	NOx	100.00	9.80E-02	0.02	0.10	---	**0.02**	**0.10**
		EPA AP-42 Table 1.4-2	CO	84.00	8.24E-02	0.02	0.08	---	**0.02**	**0.08**
		EPA AP-42 Table 1.4-2	THC	11.00	1.08E-02	2.4E-03	0.01	---	**2.4E-03**	**0.01**
		EPA AP-42 Table 1.4-2	NMHC	8.75	1.20E-01	2.7E-02	0.12	---	**2.7E-02**	**0.12**
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	5.32E-03	1.2E-03	0.01	---	**1.2E-03**	**0.01**
		EPA AP-42 Table 1.4-2	VOC	5.50	5.39E-03	1.2E-03	0.01	---	**1.2E-03**	**0.01**
		EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	1.3E-04	5.7E-04	---	**1.3E-04**	**5.7E-04**
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	7.45E-03	1.7E-03	0.01	---	**1.7E-03**	**0.01**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	Acrolein	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	Benzene	2.1E-03	2.06E-06	4.6E-07	2.0E-06	---	**4.6E-07**	**2.0E-06**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	0.08	7.35E-05	1.6E-05	7.1E-05	---	**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	---	**3.9E-04**	**1.7E-03**
		EPA AP-42 Table 1.4-3	Methanol	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	Toluene	3.4E-03	3.33E-06	7.4E-07	3.2E-06	---	**7.4E-07**	**3.2E-06**
		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 HAPs	1.2E-03	1.18E-06	2.6E-07	1.1E-06	---	**2.6E-07**	**1.1E-06**
		EPA AP-42 Table 1.4-3	Total HAP	1.88	1.84E-03	4.1E-04	1.8E-03	---	**4.1E-04**	**1.8E-03**
		40CFR98 - Table C-1	CO2	119,317	1.17E+02	26	114	---	**26**	**114**
		40CFR98 - Table C-2	CH4	2.25	2.20E-03	4.9E-04	2.1E-03	---	**4.9E-04**	**2.1E-03**
		40CFR98 - Table C-2	N2O	0.22	2.20E-04	4.9E-05	2.1E-04	---	**4.9E-05**	**2.1E-04**
		40CFR98 - Table A-1	CO2e	119,440	1.17E+02	26	114	---	**26**	**114**

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

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

New Process Flare (FL-02/18E) (MODIFIED)

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 1.4-1**	**NOx**	**126.43**	**0.10**	---	---	---	**45.10**	**5.69**
		EPA AP-42 Table 13.5-1	CO	399.77	0.31	---	---	---	**142.61**	**17.99**
		Engineering Estimate	THC	50,200	38.93	17,908	2,259	98.0%	**358.16**	**45.18**
		Engineering Estimate	NMHC	12,350	9.58	4,406	556	98.0%	**88.11**	**11.12**
	98% Control Efficiency	Engineering Estimate	NMNEHC	12,350	9.58	4,406	556	98.0%	**88.11**	**11.12**
		Engineering Estimate	VOC	12,350	9.58	4,406	556	98.0%	**88.11**	**11.12**
		EPA AP-42 Table 1.4-2	SO2	0.76	5.88E-04	---	---	---	**0.27**	**0.03**
	460.03 MMBtu/hr (HHV) (max)	EPA AP-42 Table 1.4-2	PM10/2.5	9.61	7.45E-03	---	---	---	**3.43**	**0.43**
	13.25 MMBtu/hr (HHV) (avg)	Engineering Estimate	Acetaldehyde	---	---	---	---	---	**---**	**---**
		Engineering Estimate	Acrolein	---	---	---	---	---	**---**	**---**
	8,760 hr/yr	**Engineering Estimate**	**Benzene**	**1.80**	**1.39E-03**	**0.64**	**0.08**	98.0%	**0.01**	**0.00**
		Engineering Estimate	**Ethylbenzene**	**0.34**	**2.60E-04**	**0.12**	**0.02**	98.0%	**0.00**	**0.00**
	90.00 MMscf/yr	EPA AP-42 Table 1.4-2	Formaldehyde	0.09	7.35E-05	---	---	---	**0.03**	**4.3E-03**
		Engineering Estimate	**n-Hexane**	**128.68**	**0.10**	**45.91**	**5.79**	98.0%	**0.92**	**0.12**
		EPA AP-42 Table 1.4-2	Methanol	---	---	---	---	---	**---**	**---**
	10,274 scf/hr (avg)	**Engineering Estimate**	**Toluene**	**3.43**	**2.66E-03**	**1.22**	**0.15**	98.0%	**0.02**	**3.1E-03**
	246.58 Mscfd (avg)	EPA AP-42 Table 1.4-2	2,2,4-TMP	---	---	---	---	---	**---**	**---**
		Engineering Estimate	**Xylenes**	**0.34**	**2.60E-04**	**0.12**	**0.02**	98.0%	**2.4E-03**	**3.0E-04**
		EPA AP-42 Table 1.4-2	Other HAPs	1.5E-03	1.18E-06	5.4E-04	6.8E-05	---	**5.4E-04**	**6.8E-05**
	1,290 Btu/scf (HHV) - avg	**Engineering Estimate**	**Total HAP**	**134.67**	**0.10**	**48.01**	**6.06**	97.9%	**0.99**	**0.13**
		40CFR98 - Table C-1	CO2	158,892	123.21	---	---	---	**56,681**	**7,150**
		Mass Balance	CH4	37,850	29.35	13,502	1,703	98.0%	**270**	**34**
		40CFR98 - Table C-2	N2O	1.00	7.72E-04	---	---	---	**0.35**	**0.04**
		40CFR98 - Table A-1	CO2e	1,105,432	857.21	337,551	42,581	81.2%	**63,538**	**8,015**

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 21,000 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)						CO2 (40CFR98)		
	Mol% (Vol%)	MMscf/yr	scf/hr	Btu/scf (HHV)	MMBtu/hr	lb/MMscf	Wgt%	kg/MMBtu	lb/MMBtu
Nitrogen	0.5%	0.44	49.95	---	---	---	0.6%	---	---
Carbon Dioxide	0.2%	0.17	19.24	---	---	---	0.4%	---	---
Methane	74.6%	67.15	7,665.31	1,010	7.75	37,850	56.6%	53.06	116.98
Ethane	16.9%	15.23	1,738.73	1,799	3.13	---	24.1%	59.60	131.40
VOC (Non-HAP)	7.7%	6.97	795.42	2,957	2.35	12,215	18.1%	62.87	138.60
n-Hexane	0.0472%	0.0425	4.85	4,893	0.0237	129	0.193%	---	---
Benzene	0.0007%	0.0007	0.07	3,989	0.0003	2	0.003%	---	---
Toluene	0.0012%	0.0011	0.12	4,749	0.0006	3	0.005%	---	---
Ethylenzene	0.0001%	0.0001	0.01	5,523	0.0001	0	0.001%	---	---
Xylenes	0.0001%	0.0001	0.01	5,509	0.0001	0	0.001%	---	---
2,2,4-TMP	0.0001%	0.0001	0.01	6,924	0.0001	0	0.001%	---	---
Total HAP	0.05%	0.04	5.08	4,869	0.02	135	0.202%	68.02	149.96
TOTAL	**100.0%**	**90.00**	**10,274**	**1,290**	**13.25**	**50,200**	**100.0%**	**55.89**	**123.21**

13.17

Truck Load-Out (TLO/20E)

Unit ID	Description	S sat. fac.	P psia	M lb/lb-mol	T oR	CE %	L_L lb/Mgal	T-Put Mgal/yr	VOC AP-42 Sect 5.2 tpy	BTEX, n-hexane (Ea) 5.00% of VOC tpy	Total HAP 25.00% of VOC tpy
TLO/20E	Truck Load-Out - Prod H2O/Condensat	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

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

Process Piping Fugitive Emissions (FUG/21E) (MODIFIED) - Page 01 of 02

Unit	Description	Component (Unit) Type (Gas/Vapor)	Unit Count	THC Factor lb/hr/Unit	LDAR Control Credit	THC Emissions lb/hr	VOC 23.90 Wgt%		n-Hexane 0.25 Wgt%		BTEX,TMP (Ea) 0.002 Wgt%		Total HAP 0.26 Wgt%		CO2 0.46 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	lb/hr	tpy
FUG/21E	Process Piping Fugitives (Gas/Vapor)	Valves	3,575	0.00992	67%	11.71	2.80	12.25	0.03	0.13	2.8E-04	1.2E-03	0.03	0.13	0.1	0.2	9	38	220	962
		Pump Seals	---	na	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Pressure Relief	159	0.01940	0%	3.08	0.74	3.22	0.01	0.03	7.4E-05	3.2E-04	0.01	0.04	0.01	0.1	2	10	58	253
		Connectors	7,501	0.00044	0%	3.31	0.79	3.46	0.01	0.04	7.9E-05	3.5E-04	0.01	0.04	0.02	0.1	2	11	62	272
		Flanges	1,787	0.00086	0%	1.54	0.37	1.61	3.8E-03	0.02	3.7E-05	1.6E-04	4.0E-03	0.02	0.01	0.03	1	5	29	126
		Open-ended lines	20	0.00441	0%	0.09	0.02	0.09	2.20E-04	9.64E-04	2.1E-06	9.28E-06	2.31E-04	1.01E-03	4E-04	2E-03	0.1	0.3	2	7
		Compressors	14	0.00750	0%	0.10	0.02	0.11	2.6E-04	1.1E-03	2.5E-06	1.1E-05	2.7E-04	1.2E-03	5E-04	2E-03	0.1	0.3	2	9
		SubTotal:	13,056			**SubTotal:**	4.74	20.75	0.05	0.22	4.8E-04	2.1E-03	0.05	0.23	0.1	0.4	15	65	372	1,628

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-Hexane 3.47 Wgt%		BTEX,TMP (Ea) 0.08 Wgt%		Total HAP 3.80 Wgt%		CO2 --- Wgt%		CH4 11.41 Wgt%		CO2e GWP = 25	
							lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FUG/21E	Process Piping Fugitives (Light Oil)	Valves	2,924	0.00551	61%	6.29	6.29	27.53	0.22	0.95	0.01	0.02	0.24	1.05	---	---	1	3	18	79
		Pump Seals	47	0.02866	45%	0.74	0.74	3.26	0.03	0.11	6.2E-04	2.7E-03	0.03	0.12	---	---	0.1	0.4	2	9
		Pressure Relief	79	0.01653	0%	1.31	1.31	5.75	0.05	0.20	1.1E-03	4.8E-03	0.05	0.22	---	---	0.1	1	4	16
		Connectors	6,599	0.00046	0%	3.06	3.06	13.38	0.11	0.46	2.5E-03	0.01	0.12	0.51	---	---	0.3	2	9	38
		Flanges	1,056	0.00024	0%	0.26	0.26	1.12	0.01	0.04	2.1E-04	9.3E-04	0.01	0.04	---	---	0.03	0.1	1	3
		Open-ended lines	10	0.00309	0%	0.03	0.03	0.14	1.1E-03	4.7E-03	2.6E-05	1.1E-04	1.2E-03	0.01	---	---	4E-03	0.02	0.1	0.4
		Compressors	---	0.01653	0%	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		SubTotal:	10,716			**SubTotal:**	11.68	51.17	0.41	1.77	0.01	0.04	0.44	1.95	---	---	1	6	33	146

Notes: 1 - Assumed 8,760 hours per year of fugitive emissions.

2 - Updated component counts from recent LDAR monitoring w/: 15% Contingency

3 - Gas/Vapor emissions calculated using EPA Protocol for Equipment Leak Emission Estimates, 1995, EPA-453/R-95-017

TABLE 2.4 O&G PROD (AVE)	Gas/Vapor		Light Oil		Heavy Oil		Mixture (Max)	
	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr
Valves	4.50E-03	0.00992	2.50E-03	0.00551	8.40E-06	0.00002	4.50E-03	0.00992
Pump Seals	na	na	1.30E-02	0.02866	2.40E-03	0.00529	1.30E-02	0.02866
Other[4]	8.80E-03	0.01940	7.50E-03	0.01653	3.20E-05	0.00007	8.80E-03	0.01940
Connectors	2.00E-04	0.00044	2.10E-04	0.00046	7.50E-06	0.00002	2.10E-04	0.00046
Flanges	3.90E-04	0.00086	1.10E-04	0.00024	3.90E-07	0.00000	3.90E-04	0.00086
Open-ended lines	2.00E-03	0.00441	1.40E-03	0.00309	1.40E-04	0.00031	2.00E-03	0.00441

4 - "Other" components include compressor seals, relief valves, diaphragms, drains, meters, etc.

5 - LDAR Control Credit from "Leak Detection and Repair Compliance Assistance Guidance—A Best Practices Guide" Table 4-1, w/ Quarterly Monitoring and 10,000 ppm Leak Definition.

6 - THC = total hydrocarbons, including methane (CH4) and ethane (C2H6).

7 - VOC = non-methane/non-ethane THC (C3+).

8 - HAP = hazardous air pollutants as designated by EPA, primarily n-hexane/BTEX.

9 - The following gas characteristics were assumed: 20.0% Safety Margin

Pollutant	Gas/Vapor Estimated	Light Oil Estimated	Heavy Oil Estimated	Mixture (Max) Estimated
Carbon Dioxide	0.46 Wgt%	--- Wgt%	--- Wgt%	0.46 Wgt%
Methane	75.00 Wgt%	11.41 Wgt%	--- Wgt%	75.00 Wgt%
VOC (Propane)	23.90 Wgt%	100.00 Wgt%	100.00 Wgt%	100.00 Wgt%
n-Hexane	0.25 Wgt%	3.47 Wgt%	3.47 Wgt%	3.47 Wgt%
Benzene	0.003 Wgt%	0.05 Wgt%	0.05 Wgt%	0.05 Wgt%
Toluene	0.01 Wgt%	0.15 Wgt%	0.15 Wgt%	0.15 Wgt%
Ethylbenzene	0.001 Wgt%	0.005 Wgt%	0.005 Wgt%	0.005 Wgt%
Xylenes	0.001 Wgt%	0.01 Wgt%	0.01 Wgt%	0.01 Wgt%
2,2,4-TMP	0.001 Wgt%	0.12 Wgt%	0.12 Wgt%	0.12 Wgt%
Total HAP:	0.26 Wgt%	3.80 Wgt%	3.80 Wgt%	3.80 Wgt%

Williams Ohio Valley Midstream LLC

FORT BEELER GAS PROCESSING PLANT

Class II Administrative Update (R13-2826J)

Attachment N - Supporting Emissions Calculations

Process Piping Fugitive Emissions (FUG/21E) (MODIFIED) - Page 02 of 02

Unit	Description	Component (Unit) Type (Gas/Vapor)	Unit Count	THC Factor lb/hr/Unit	LDAR Control Credit	THC Emissions lb/hr	VOC 100.00 Wgt% lb/hr	VOC 100.00 Wgt% tpy	n-Hexane 3.47 Wgt% lb/hr	n-Hexane 3.47 Wgt% tpy	BTEX (Ea) 0.08 Wgt% lb/hr	BTEX (Ea) 0.08 Wgt% tpy	Total HAP 3.80 Wgt% lb/hr	Total HAP 3.80 Wgt% tpy	CO2 --- Wgt% lb/hr	CO2 --- Wgt% tpy	CH4 --- Wgt% lb/hr	CH4 --- Wgt% tpy	CO2e GWP = 25 lb/hr	CO2e GWP = 25 tpy
FUG/21E	Process Piping Fugitives (Heavy Oil)	Valves	67	0.00002	0%	1.2E-03	1.2E-03	5.4E-03	4.3E-05	1.9E-04	1.0E-06	4.5E-06	4.7E-05	2.1E-04	---	---	---	---	---	---
		Pump Seals	---	0.00529	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Pressure Relief	2	0.00007	0%	1.6E-04	1.6E-04	7.1E-04	5.6E-06	2.5E-05	1.4E-07	5.9E-07	6.2E-06	2.7E-05	---	---	---	---	---	---
		Connectors	131	0.00002	0%	2.2E-03	2.2E-03	0.01	7.5E-05	3.3E-04	1.8E-06	7.9E-06	8.2E-05	3.6E-04	---	---	---	---	---	---
		Flanges	---	0.00000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Open-ended lines	---	0.00031	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Compressors	---	0.00002	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		SubTotal:	200			**SubTotal:**	3.6E-03	0.02	1.2E-04	5.4E-04	3.0E-06	1.3E-05	1.4E-04	5.9E-04	---	---	---	---	---	---

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% lb/hr	VOC 100.00 Wgt% tpy	n-Hexane 3.47 Wgt% lb/hr	n-Hexane 3.47 Wgt% tpy	BTEX (Ea) 0.08 Wgt% lb/hr	BTEX (Ea) 0.08 Wgt% tpy	Total HAP 3.80 Wgt% lb/hr	Total HAP 3.80 Wgt% tpy	CO2 0.46 Wgt% lb/hr	CO2 0.46 Wgt% tpy	CH4 75.00 Wgt% lb/hr	CH4 75.00 Wgt% tpy	CO2e GWP = 25 lb/hr	CO2e GWP = 25 tpy
FUG/21E	Process Piping Fugitives (Mixture)	Valves	187	0.00992	0%	1.86	1.86	8.15	0.06	0.28	1.5E-03	6.8E-03	0.07	0.31	8.6E-03	0.04	1.4	6	35	153
		Pump Seals	---	0.02866	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Pressure Relief	---	0.01940	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Connectors	351	0.00046	0%	0.16	0.16	0.71	0.01	0.02	1.4E-04	5.9E-04	0.01	0.03	8E-04	3.3E-03	0.1	1	3	13
		Flanges	37	0.00086	0%	0.03	0.03	0.14	1.1E-03	4.8E-03	2.6E-05	1.2E-04	1.2E-03	0.01	1E-04	6.4E-04	0.02	0.10	1	3
		Open-ended lines	---	0.00441	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Compressors	---	0.01940	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		SubTotal:	575			**SubTotal:**	2.05	9.00	0.07	0.31	1.7E-03	7.5E-03	0.08	0.34	9.5E-03	0.04	2	7	39	169
	CURRENT PERMIT:	**18,470**	24,550	**TOTAL FUGITIVE EMISSIONS:**			18.48	80.93	0.53	2.30	0.01	0.05	0.57	2.51	0.1	0.4	18	78	444	1,943

Notes: 1 - Assumed 8,760 hours per year of fugitive emissions.

2 - Updated component counts from recent LDAR monitoring w/: 15% Contingency

3 - Gas/Vapor emissions calculated using EPA Protocol for Equipment Leak Emission Estimates, 1995, EPA-453/R-95-017

TABLE 2.4 O&G PROD (AVE)	Gas/Vapor kg/hr	Gas/Vapor lb/hr	Light Oil kg/hr	Light Oil lb/hr	Heavy Oil kg/hr	Heavy Oil lb/hr	Mixture (Max) kg/hr	Mixture (Max) lb/hr
Valves	4.50E-03	0.00992	2.50E-03	0.00551	**8.40E-06**	**0.00002**	**4.50E-03**	**0.00992**
Pump Seals	na	na	1.30E-02	0.02866	**2.40E-03**	**0.00529**	**1.30E-02**	**0.02866**
Other[4]	8.80E-03	0.01940	7.50E-03	0.01653	**3.20E-05**	**0.00007**	**8.80E-03**	**0.01940**
Connectors	2.00E-04	0.00044	2.10E-04	0.00046	**7.50E-06**	**0.00002**	**2.10E-04**	**0.00046**
Flanges	3.90E-04	0.00086	1.10E-04	0.00024	**3.90E-07**	**0.00000**	**3.90E-04**	**0.00086**
Open-ended lines	2.00E-03	0.00441	1.40E-03	0.00309	**1.40E-04**	**0.00031**	**2.00E-03**	**0.00441**

4 - "Other" components include compressor seals, relief valves, diaphragms, drains, meters, etc.

5 - LDAR Control Credit from "Leak Detection and Repair Compliance Assistance Guidance—A Best Practices Guide" Table 4-1, w/ Quarterly Monitoring and 10,000 ppm Leak Definition.

6 - THC = total hydrocarbons, including methane (CH4) and ethane (C2H6).

7 - VOC = non-methane/non-ethane THC (C3+).

8 - HAP = hazardous air pollutants as designated by EPA, primarily n-hexane/BTEX.

9 - The following gas characteristics were assumed: 20.0% Safety Margin

Pollutant	Gas/Vapor Estimated	Light Oil Estimated	Heavy Oil Estimated	Mixture (Max) Estimated
Carbon Dioxide	0.46 Wgt%	--- Wgt%	**--- Wgt%**	**0.46 Wgt%**
Methane	75.00 Wgt%	11.41 Wgt%	**--- Wgt%**	**75.00 Wgt%**
VOC (Propane)	23.90 Wgt%	100.00 Wgt%	**100.00 Wgt%**	**100.00 Wgt%**
n-Hexane	0.25 Wgt%	3.47 Wgt%	**3.47 Wgt%**	**3.47 Wgt%**
Benzene	0.003 Wgt%	0.05 Wgt%	**0.05 Wgt%**	**0.05 Wgt%**
Toluene	0.01 Wgt%	0.15 Wgt%	**0.15 Wgt%**	**0.15 Wgt%**
Ethylbenzene	0.001 Wgt%	0.005 Wgt%	**0.005 Wgt%**	**0.005 Wgt%**
Xylenes	0.001 Wgt%	0.01 Wgt%	**0.01 Wgt%**	**0.01 Wgt%**
2,2,4-TMP	0.001 Wgt%	0.12 Wgt%	**0.12 Wgt%**	**0.12 Wgt%**
Total HAP:	0.26 Wgt%	3.80 Wgt%	**3.80 Wgt%**	**3.80 Wgt%**

Produced Water 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	bbl		gal/yr	bbl/yr		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
T-03/22E	Produced Water (9913)	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-04/23E	Produced Water (9914)	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 Virigina Air quality regulation 45CSR13.

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
	NMNEHC (VOC w/o HCHO)	6.48E-02	6.52E-02	9.10E-03	1.39E-03	1.39E-03	2.08E-03
	VOC (NMNEHC w/HCHO)	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 (Total)	4.83E-02	9.99E-03	1.94E-02	6.60E-03	6.60E-03	6.60E-03
HAPs	Acetaldehyde	7.76E-03	8.36E-03	2.79E-03	4.00E-05	4.00E-05	4.00E-05
	Acrolein	7.78E-03	5.14E-03	2.63E-03	6.40E-06	6.40E-06	6.40E-06
	Benzene	1.94E-03	4.40E-04	1.58E-03	1.20E-05	1.20E-05	9.10E-07
	Butadiene, 1,3-	8.20E-04	2.67E-04	6.63E-04	4.30E-07	4.30E-07	4.30E-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	---	---	---	---
	Methanol (MeOH)	2.48E-03	2.50E-03	3.06E-03	---	---	---
	Polycyclic Organic Matter (POM)	1.34E-04	3.47E-04	9.71E-05	3.03E-05	3.03E-05	3.03E-05
	Toluene	9.63E-04	4.08E-04	5.58E-04	1.30E-04	1.30E-04	1.30E-04
	Trimethylpentane, 2,2,4- (i-Octane)	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/Trace HAP	6.57E-04	3.21E-04	1.79E-04	2.90E-05	2.90E-05	2.90E-05
	TOTAL HAP	7.94E-02	7.22E-02	3.23E-02	1.05E-03	1.05E-03	3.53E-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*
	AP-42 CO2e vs. Part 98 CO2e:	1.17E+02	1.17E+02	1.17E+02			

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

	Pollutant	GAS-FIRED EXTERNAL COMBUSTION			FLARE	DIESEL ENGINES	
		AP-42 Table 1.4-1; 1.4-2; 1.4-3 (<100 MMBtu/hr) 07/98			13.5-1 12/16	3.3-1; 3.3-2 10/96	Tier 4 ≥ 750 bhp
		Uncontrolled lb/MMBtu	LoNOx Burners lb/MMBtu	Flue Gas Recirc lb/MMBtu	Combustion lb/MMBtu	Uncontrolled lb/MMBtu	Uncontrolled lb/MMBtu
CRITERIA	NOX (<100 MMBtu/hr))	9.80E-02	4.90E-02	3.14E-02	External Combustion	4.41E+00	8.34E-01
	CO (<100 MMBtu/hr)	8.24E-02	8.24E-02	8.24E-02	3.1E-01	9.50E-01	8.34E-01
	NMNEHC (VOC w/o HCHO)	5.32E-03	5.32E-03	5.32E-03		3.53E-01	4.47E-02
	VOC (NMNEHC w/HCHO)	5.39E-03	5.39E-03	5.39E-03		3.55E-01	4.59E-02
	SO2 (2,000 gr-S/MMscf)	5.88E-04	5.88E-04	5.88E-04		2.90E-01	2.90E-01
	PM10/2.5 (Total)	7.45E-03	7.45E-03	7.45E-03		3.10E-01	9.39E-03
HAPs	Acetaldehyde	---	---	---		7.67E-04	7.67E-04
	Acrolein	---	---	---		9.25E-05	9.25E-05
	Benzene	2.06E-06	2.06E-06	2.06E-06		9.33E-04	9.33E-04
	Butadiene, 1,3-	---	---	---	*USE*	3.91E-05	3.91E-05
	Ethylbenzene	---	---	---		---	---
	Formaldehyde (HCHO)	7.35E-05	7.35E-05	7.35E-05	≥98% DRE	1.18E-03	1.18E-03
	n-Hexane	1.76E-03	1.76E-03	1.76E-03		---	---
	Methanol (MeOH)	---	---	---	*OR*	---	---
	Polycyclic Organic Matter (POM)	6.85E-07	6.85E-07	6.85E-07		1.52E-04	1.52E-04
	Toluene	3.33E-06	3.33E-06	3.33E-06	External Combustion	4.09E-04	4.09E-04
	Trimethylpentane, 2,2,4- (i-Octane)	---	---	---		---	---
	Xylenes	---	---	---	*AS APPLICABLE*	2.85E-04	2.85E-04
	Other/Trace HAP	1.18E-06	1.18E-06	1.18E-06		---	---
	TOTAL HAP	1.85E-03	1.85E-03	1.85E-03		3.86E-03	3.86E-03
GHG	CO2 (GWP=1)	1.18E+02	1.18E+02	1.18E+02		1.64E+02	1.64E+02
	CH4 (GWP=25)	2.25E-03	2.25E-03	2.25E-03		*6.61E-03*	*6.61E-03*
	N2O (GWP=298)	2.16E-03	2.16E-03	2.16E-03		*1.32E-03*	*1.32E-03*
	CO2e	*1.18E+02*	*1.18E+02*	*1.18E+02*		*1.65E+02*	*1.65E+02*
	AP-42 CO2e vs. Part 98 CO2e:	1.17E+02	1.17E+02	1.17E+02		1.64E+02	1.64E+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)	138,000 Btu/gal	163.0539	0.00661	0.00132
Propane	91,000 Btu/gal	138.6046	0.00661	0.00132
Natural Gas	1,026 Btu/scf	116.9773	0.00220	0.00022

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

Conversion Factors

1.0 lb	=	453.5924 g
1.0 kg	=	2.2046 lb
1.0 hp	=	746.0000 Watt
1.0 hp-hr	=	2,544.4336 Btu
1.0 kW-hr	=	3,412.1416 Btu
1.0 kW-hr	=	1.3410 hp-hr
1.0 cf	=	7.4805 gal
1.0 gal H2O	=	8.3378 lb
1.0 m	=	3.2808 ft
1.0 km	=	0.6214 mile
1.0 acre	=	43,560.1742 ft2
1.0 oF	=	(^{o}C*9/5)+32
1.0 oR	=	^{o}F+459.67
1.0 atm	=	14.6959 psia
1.0 lbmol (60 °F & 1 atm)	=	379.482 scf

Reviewed and Revised: 05/25/17 - CAR

ATTACHMENT O

Monitoring/Recordkeeping/Reporting/Testing Plans

"31. **Monitoring, Recordkeeping, Reporting and Testing Plans**. Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as Attachment O."

Williams Ohio Valley Midstream LLC proposes that all monitoring, recordkeeping, reporting and testing requirements remain unchanged from the current permit.

ATTACHMENT P

Public Notice

"32. **Public Notice**. At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and Example Legal Advertisement for details). Please submit the **Affidavit of Publication** as Attachment P immediately upon receipt."

The applicant shall cause such legal advertisement to appear a minimum of one (1) day in the newspaper most commonly read in the area where the facility exists or will be constructed. The notice must be published no earlier than five (5) working days of receipt by this office of your application. The original affidavit of publication must be received by this office no later than the last day of the public comment period.

Types and amounts of pollutants discharged must include all regulated pollutants (PM, PM10, VOC, SO2, Xylene, etc.) and their potential to emit or the permit level being sought in units of tons per year (including fugitive emissions).

- Legal Advertisement (as shown) will be placed in a newspaper of general circulation in the area where the source is located (See 45CSR§13-8.3 thru 45CSR§13-8.5).
- An Affidavit of Publication shall be submitted immediately upon receipt.

Attachment P - Public Notice

AIR QUALITY PUBLIC NOTICE
Notice of Application

Notice is given that Williams Ohio Valley Midstream LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a 45CSR13 Class II Administrative Update for the existing Fort Beeler Gas Processing Plant, located south of the intersection of County Highway 34 and US Route 250, near Cameron, in Marshall County, West Virginia.

The latitude and longitude coordinates are 39.8783^{O} North and -80.5907^{O} West.

The applicant estimates the increase/(decrease) in the potential to discharge regulated air pollutants will be as follows:

0.79	tons of nitrogen oxides per year
(4.36)	tons of carbon monoxide per year
(4.24)	tons of volatile organic compounds per year
(0.01)	tons of sulfur dioxide per year
(0.10)	tons of particulate matter per year
(5.22)	tons of total hazardous air pollutants per year
(1,696)	tons of carbon dioxide equivalent per year

Startup of modifications are anticipated upon permit issuance.

Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality (DAQ), 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the _____ day of _____ 2017.

By: Williams Ohio Valley Midstream LLC
Paul V. Hunter
General Manager Ohio River Supply Hub
Park Place Corporate Center 2
2000 Commerce Drive
Pittsburgh, PA 15275

ATTACHMENT Q

Business Confidential Claims

(NOT APPLICABLE)

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also

ATTACHMENT R

Authority Forms

(NOT APPLICABLE)

ATTACHMENT S

Title V Permit Revision Information

Attachment S

Title V Permit Revision Information

1. New Applicable Requirements Summary	
Mark all applicable requirements associated with the changes involved with this permit revision:	
☐ SIP	☐ FIP
☒ **Minor source NSR (45CSR13)**	☐ PSD (45CSR14)
☐ NESHAP (45CSR15)	☐ Nonattainment NSR (45CSR19)
☒ **Section 111 NSPS (Subpart(s) A, KKK and OOOO)**	☐ Section 112(d) MACT standards (Subpart(s) _____)
☐ Section 112(g) Case-by-case MACT	☐ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts	☐ Stratospheric ozone (Title VI)
☐ Tank vessel reqts, section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☐ 45CSR27 State enforceable only rule
☐ 45CSR4 State enforceable only rule (Odors)	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ Compliance Assurance Monitoring (40CFR64) (1)
☐ NO_x Budget Trading Program Non-EGUs (45CSR1)	☐ NO_x Budget Trading Program EGUs (45CSR26)

(1) If this box is checked, please include **Compliance Assurance Monitoring (CAM) Form(s)** for each Pollutants Specific Emission Unit (PSEU) (See Attachment H to Title V Application). If this box is not checked, please explain why **Compliance Assurance Monitoring** is not applicable:

NA

2. Non-Applicability Determinations
List all requirements, which the source has determined not applicable to this permit revision and for which a permit shield is requested. The listing shall also include the rule citation and a rationale for the determination. **NA**
☐ **Permit Shield Requested** *(not applicable to Minor Modifications)*
All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

3. Suggested Title V Draft Permit Language

Are there any changes involved with this Title V Permit revision outside of the scope of the NSR Permit revision? ☐ Yes ☒ No If Yes, describe the changes below.

Also, please provide **Suggested Title V Draft Permit language** for the proposed Title V Permit revision (including all applicable requirements associated with the permit revision and any associated monitoring /recordkeeping/ reporting requirements), OR attach a marked up pages of current Title V Permit. Please include appropriate citations (Permit or Consent Order number, condition number and/or rule citation (e.g. 45CSR§7-4.1)) for those requirements being added / revised.

1.1 Emission Units:

Removal of FL-01 | 17E Old Process Flare | All Plants | 2011 | 5 MMscf/yr | NA
SSM | 6E Startup/Shutdown/Maint | All Plants | 2010/2017 | NA | FL-02 (18E) See Note 3
FL-02 | 18E New Process Flare | All Plants | 2014 | 90.00 MMscf/yr | NA

6.0 Removal of this section as Flare Control Device FL-01 is permanently disconnected.

7.1.1. Increase FL-02 Maximum Flare Gas thru-put from 59.21 MMscf/yr to 90.00 MMscf/yr.

7.1.2. Change FL-02 VOC emission limits from 127.79 lb/hr and 8.88 tpy to 88.11 lb/hr and 11.12 tpy.
Increase FL-02 NOx emission limits from 36.85 lb/hr and 2.56 tpy to 45.10 lb/hr and 5.69 tpy.
Change FL-02 CO emission limits from 200.51 lb/hr and 13.94 tpy to 142.61 lb/hr and 17.99 tpy.
Increase FL-02 PM10 emission limits from 4.04 lb/hr and 0.28 tpy to 3.43 lb/hr and 0.43 tpy.

4. Active NSR Permits/Permit Determinations/Consent Orders Associated With This Permit Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
R13-2826J	**06/16/2016**	**8.1.2.a. Increase FL-02 NOx emission limits from 31.28 lb/hr and 3.95 tpy to 45.10 lb/hr and 5.69 tpy.**

5. Inactive NSR Permits/Obsolete Permit or Consent Orders Conditions Associated With This Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
	mm/dd/yyyy	

6. Change in Potential Emissions (vs. R13-2826J)

Pollutant	Change in Potential Emissions (+ or -), TPY
NOx	**+0.79**
CO	**-4.36**
VOC	**-4.24**
PM	**-0.10**
SO2	**-0.01**
HAPs	**-5.22**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

7. Certification For Use Of Minor Modification Procedures *(Required Only for Minor Modification Requests)*

Note:	*This certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete. The criteria for allowing the use of Minor Modification Procedures are as follows:*

i. Proposed changes do not violate any applicable requirement;

ii. Proposed changes do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;

iii. Proposed changes do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient air quality impacts, or a visibility increment analysis;

iv. Proposed changes do not seek to establish or change a permit term or condition for which there is no underlying applicable requirement and which permit or condition has been used to avoid an applicable requirement to which the source would otherwise be subject (synthetic minor). Such terms and conditions include, but are not limited to a federally enforceable emissions cap used to avoid classification as a modification under any provision of Title I or any alternative emissions limit approved pursuant to regulations promulgated under § 112(j)(5) of the Clean Air Act;

v. Proposed changes do not involve preconstruction review under Title I of the Clean Air Act or 45CSR14 and 45CSR19;

vi. Proposed changes are not required under any rule of the Director to be processed as a significant modification;

Notwithstanding subparagraph 45CSR§30-6.5.a.1.A. (items i through vi above), minor permit modification procedures may be used for permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, to the extent that such minor permit modification procedures are explicitly provided for in rules of the Director which are approved by the U.S. EPA as a part of the State Implementation Plan under the Clean Air Act, or which may be otherwise provided for in the Title V operating permit issued under 45CSR30.

Pursuant to 45CSR§30-6.5.a.2.C., the proposed modification contained herein meets the criteria for use of Minor permit modification procedures as set forth in Section 45CSR§30-6.5.a.1.A. The use of Minor permit modification procedures are hereby requested for processing of this application.

(Signed):		Date:	____ / ____ /2017
	(Please use blue ink)		*(Please use blue ink)*
Named (typed):	**PAUL HUNTER**	Title:	**GENERAL MANAGER OHIO RIVER SUPPLY HUB**

Note: Please check if the following included (if applicable):	
☐	Compliance Assurance Monitoring Form(s)
☐	Suggested Title V Draft Permit Language

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

APPLICATION FEE

Include a check payable to WVDEP – Division of Air Quality.

As per WV Rule 22 (45CSR22) filed on May 6, 1991, a **minimum fee of** … **$300 for each Class II administrative update application** filed with the WVDEP-DAQ.

- **Additional charges** may apply, depending on the nature of the application as outlined in Section 3.4.b. of Regulation 22, and shown below:

o	**NSPS Requirements:**	**$1,000**	**Applicable**
o	NESHAP Requirements:	$2,500	Not Applicable
o	New Major Source:	$10,000	Not Applicable
o	Major Modifications:	$5,000	Not Applicable

- Total application fee is **$1,300** [= $300 minimum fee + $1,000 additional charges]

******* End of Application for Class II Administrative Update ******