Received
April 7, 2020
WV DEP/DIV OF AIR QUALITY

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

May 6, 2020
VIA Federal Express

Carrie McCumbers
Title V Operating Permit Program Manager
WV Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304-2345

RE: Application for Title V Permit (45CSR30) Renewal
Permit #R30-05100141-2015, Issued 11/10/2015
Williams Ohio Valley Midstream LLC
Moundsville Fractionation Plant
Marshall County, West Virginia

Dear Ms. McCumbers:

Williams Ohio Valley Midstream LLC is submitting this Application for a Title V Operating Permit Renewal in accordance with the West Virginia Air Control Act and Title 45 Series 30 (45CSR30) for the Moundsville Fractionation Plant located at 200 Caiman Drive, Moundsville, in Marshall County, West Virginia.

The Moundsville Fractionation Plant is currently operating under West Virginia Department of Environmental Protection Title V Permit No. R30-05100141-2015, issued November 10, 2015 with the expiration date of November 11, 2020. A renewal application is due six months prior to expiration or no later than May 10, 2020.

If you have any questions concerning this submittal or need additional information, please feel free to contact me at (304) 843-3191 or via email at steven.sobutka@williams.com .

Sincerely,

Steven J. Sobutka
Environmental Specialist III

Enclosures:
Title V Permit Application – checklist
Two electronically signed copies of the Application:

- Title V Permit Application – General Forms
- Attachments A through H
- Supplements 01 through 07

Two (2) flash drives each with/PDF file of the Application

Application for Title V Permit (45CSR30) Renewal
Williams Ohio Valley Midstream LLC
Moundsville Fractionation Plant

Title V Permit Application Checklist
For Administrative Completeness

A complete application is demonstrated when all of the information required below is properly prepared, completed and attached. The items listed below are required information which must be submitted with a Title V permit application. Any submittal will be considered incomplete if the required information is not included.*	
☒	Two signed copies of the application (at least one must contain the original "*Certification*" page signed and dated in blue ink) **(General Form No. 28)**
☒	Correct number of copies of the application on separate CDs or diskettes, (i.e. at least one disc per copy) **(Two (2) Paper Copies and Two (2) CDs)**
☒	*Table of Contents (needs to be included but not for administrative completeness)
☒	Facility information **(General Form No. 12)**
☒	Description of process and products, including NAICS and SIC codes, and including alternative operating scenarios **(General Form No. 14 and Supplement 01)**
☒	**Attachment A** - Area map showing plant location **(Attachment A)**
☒	**Attachment B** - Plot plan showing buildings and process areas **(Attachment B)**
☒	**Attachment C** - Process flow diagram(s), showing all emission units, control equipment, emission points, and their relationships **(Attachment C)**
☒	Identification of all applicable requirements with a description of the compliance status **(General Form No. 20, Attachment E, and Supplement 02)**, the methods used for demonstrating compliance **(General Form No. 20, Attachment E, and Supplement 03)**, and a Schedule of Compliance Form **(Attachment F)** for all requirements for which the source is not in compliance
☒	Listing of all active permits and consent orders (if applicable) **(General Form No. 21)**
☒	Facility-wide emissions summary **(General Form No. 23 and Supplement 03)**
☒	Identification of Insignificant Activities **(General Form No. 24)**
☒	**Attachment D** - Title V Equipment Table **(Attachment D)** completed for all emission units at the facility except those designated as insignificant activities **(General Form No. 24)**
☒	**Attachment E** - Emission Unit Form **(Attachment E)** completed for each emission unit listed in the Title V Equipment Table **(Attachment D)**
☐ na	**Attachment F** - Schedule of Compliance Form **(Attachment F)** for all requirements for which each emission unit is not in compliance **(Not Applicable)**
☒	**Attachment G** - Air Pollution Control Device Form **(Attachment G)** completed for each control device listed in the Title V Equipment Table **(Attachment D)**
☐ na	**Attachment H** - Compliance Assurance Monitoring (CAM) Form **(Not Applicable)** completed for each control device for which the "Is the device subject to CAM?" question is answered "Yes" on the Air Pollution Control Device Form **(Attachment G)**
☒	General Application Forms signed by a Responsible Official **(General Form No. 28)**
☐ na	Confidential Information submitted in accordance with 45CSR31 **(Not Applicable)**

Application for
Title V Permit (45CSR30) Renewal
(R30-051-00141-2015)

For the:

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

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 26041-2790

Prepared by:

EcoLogic Environmental Consultants, LLC
864 Windsor Court
Santa Barbara, CA 93111-1037

March 2020

Application for
Title V Permit (45CSR30) Renewal
(R30-051-00141-2015)

Williams Ohio Valley Midstream LLC
Moundsville Fractionation Plant
Marshall County, West Virginia

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- Attachment B Plot Plan(s)
- Attachment C Process Flow Diagram (PFD)
- Attachment D Equipment Table
- Attachment E Emission Unit Form(s)
- Attachment F Schedule of Compliance Form (Not Applicable)
- Attachment G Air Pollution Control Device Form(s)
- Attachment H Compliance Assurance Monitoring (CAM) (Not Applicable)

Supplements to the Application

- Supplement 01 Process Description
- Supplement 02 Regulatory Discussion
- Supplement 03 Emission Calculations
- Supplement 04 Emission Program Results (Not Applicable)
- Supplement 05 Lab Analysis
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Title V Permit Renewal

General Forms

- **Section 1: General Information**
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- **Section 4: Insignificant Activities**
- **Section 5: Emission Units, Control Devices, and Emission Points**
- **Section 6: Certification of Information**

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street SE
Charleston, WV 25304
Phone: (304) 926-0475
www.dep.wv.gov/daq

Received
April 7, 2020
WV DEP/DIV OF AIR QUALITY

INITIAL/RENEWAL TITLE V PERMIT APPLICATION - GENERAL FORMS

Section 1: General Information

1. Name of Applicant (As registered with the WV Secretary of State's Office):
Williams Ohio Valley Midstream LLC

2. Facility Name or Location:
Moundsville Fractionation Plant

3. DAQ Plant ID No.:
0 5 1 - 0 0 1 4 1

4. Federal Employer ID No. (FEIN):
2 7 - 0 8 5 6 7 0 7

5. Permit Application Type:
- ☐ Initial Permit
- ☑ Permit Renewal
- ☐ Update to Initial/Renewal Permit Application

When did operations commence? 2012
What is the expiration date of the existing permit?
11/10/2020

6. Type of Business Entity:
- ☐ Corporation
- ☐ Government Agency
- ☑ LLC
- ☐ Partnership
- ☐ Limited Partnership

7. Is the Applicant the:
- ☑ Owner
- ☐ Operator
- ☑ Both

If the Applicant is not both the owner and operator, please provide the name and address of the other party.

na

8. Number of On-site Employees:
~37

9. Governmental Code:
- ☑ Privately owned and operated; 0
- ☐ Federally owned and operated; 1
- ☐ State government owned and operated; 2
- ☐ County government owned and operated; 3
- ☐ Municipality government owned and operated; 4
- ☐ District government owned and operated; 5

10. 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.

Section 1: General Information - Continued

11. Mailing Address

Street or P.O. Box:
Williams Ohio Valley Midstream LLC
100 Teletech Drive, Suite 2

City:	**State:**	**Zip:**
Moundsville	WV	26041-2790
Telephone Number: (304) 843-3103	**Fax Number:** (304) 843-3131	

12. Facility Location

Street:	**City:**	**County:**
200 Caiman Drive ~2 Miles South of Moundsville	Moundsville	Marshall
UTM Easting: 517.35 km	**UTM Northing:** 4,418.11 km	**Zone:** ☑ 17 ☐ 18

Directions:
From Moundsville -
1) WV-2/Lafayette Ave South, then West, approximately 2 miles.
2) Site is on the right, at the site of the former Olin Facility in Round Bottom.

Portable Source?
☐ Yes ☑ No

Is facility located w/in a nonattainment area? ☐ Yes ☑ No	**If yes, for what air pollutants?** na
Is facility located w/n 50 miles of another state? ☑ Yes ☐ No	**If yes, name the affected state(s).** Ohio and Pennsylvania
Is facility located w/in 100 km of a Class I Area[1]? ☐ Yes ☑ No **If no, do emissions impact a Class I Area[1]?** ☐ Yes ☑ No	**If yes, name the area(s).** na

[1] *Class I areas include Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and Shenandoah National Park James River Face Wilderness Area in Virginia.*

Section 1: General Information - Continued

13. Contact Information		
Responsible Official: Paul V. Hunter	**Title:** Vice President	
Street or P.O. Box: Williams Ohio Valley Midstream LLC Park Place Corporate Center 2 2000 Commerce Drive		
City: Pittsburgh	**State:** PA	**Zip:** 15275-1026
Telephone Number: (412) 787-7300	**Fax Number:** (412) 787-6002	
E-mail address: PaulV.Hunter@Williams.Com		
Environmental Contact: Steven Sobutka	**Title:** Environmental Specialist	
Street or P.O. Box: Williams Ohio Valley Midstream LLC 100 Teletech Drive, Suite 2		
City: Moundsville	**State:** WV	**Zip:** 26041-2790
Telephone Number: (304) 843-3191	**Fax Number:** (304) 843-3131	
E-mail address: Steven.Sobutka@Williams.Com		
Application Preparer: Walter Konkel, III	**Title:** Principal Scientist	
Company: EcoLogic Environmental Consultants, LLC		
Street or P.O. Box: 864 Windsor Court		
City: Santa Barbara	**State:** CA	**Zip:** 93111-1037
Telephone Number: (805) 964-7597	**Fax Number:** ---	
E-mail address: WKonkel@ELogicLLC.com		

Section 1: General Information - Continued

14. Facility Description

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

Process	Products	NAICS	SIC
Natural Gas Liquid (NGL) Fractionation	Propane, Butane, and Natural Gasoline	211112	1321
Finished Product Loading	Propane, Butane, and Natural Gasoline	211112	1321
Stabilized Condensate Loading	Stabilized Condensate	211112	1321

Provide a general description of operations.

Please reference SUPPLEMENT 01 – Process Description

The OVM Moundsville Fractionation Plant has the capacity to fractionate 42,500 barrels per day of raw, mixed, Natural Gas Liquids (NGL) into propane (C3), butanes (C4), and natural gasoline (C5+).

Emissions will include the following:

- Fractionation Plant (Frac1/1S and Frac2/1S) Fugitive Emissions
- Natural Gas Combustion for the Hot Oil Heaters (HTR-01 (1E) and HTR-02 (2E)
- Waste Gas Combustion in the Flare (FL-02/5S).

Note that there are no vents or other emission points in the fractionation process other than fugitive emissions from valves and fittings. Similarly, storage tanks and truck/rail loading are accomplished with totally enclosed systems with vapor return lines and no vents. (Except that emissions from two (2) 420,000 gal natural gasoline tanks, and from natural gasoline truck and rail load-out, are controlled by the flare (FL-02/5S).)

The hot oil heaters are fueled with commercially supplied natural gas

The flare (FL-02/5S) is used for combustion of waste NGL and products associated with continuous and plant operations and periodic maintenance (e.g., blowdown) activities.

15. Provide an **Area Map** showing plant location as **ATTACHMENT A**.

16. Provide a Plot Plan(s), e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is located as **ATTACHMENT B**. For instructions, refer to "Plot Plan - Guidelines."

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

Section 2: Applicable Requirements

18. Applicable Requirements Summary	
Instructions: Mark all applicable requirements.	
☐ SIP	☐ FIP
☑ **Minor source NSR (45CSR13)**	☐ PSD (45CSR14)
☑ **NESHAP (45CSR34) (DDDDD)**	☐ Nonattainment NSR (45CSR19)
☑ **Section 111 NSPS (Dc, Kb, JJJJ, and OOOO)**	☐ Section 112(d) MACT Standards
☐ Section 112(g) Case-by-case MACT	☑ **112(r) RMP**
☐ Section 112(i) Early Reduction of HAP	☐ Consumer/Commercial Prod. Reqts., Sect 183(e)
☐ Section 129 Standards/Reqts.	☐ Stratospheric Ozone (Title VI)
☐ Tank vessel Reqt., Section 183(f)	☐ Emissions Cap 45CSR§30-2.6.2
☐ NAAQS, Increments or Visibility (temp. sources)	☐ 45CSR27 State Enforceable Only Rule (CPU)
☑ **45CSR4 State Enforceable Only Rule (Malodors)**	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ Compliance Assurance Monitoring (40CFR§64)
☐ CAIR NOx Annual Trading Program (45CSR39)	☐ CAIR NOx Ozone Trading Program (45CSR40)
☐ CAIR SO2 Trading Program (45CSR41)	

Section 2: Applicable Requirements - Continued

19. Non Applicability Determinations

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

Please reference SUPPLEMENT 02 – Regulatory Discussion

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

NSPS D - No boiler greater than 250 MMBtu/hr (40CFR§60.40(a)(1))
NSPS Da - No boiler greater than 250 MMBtu/hr (40CFR§60.40a(a)(1))
NSPS Db - No boiler greater than 100 MMBtu/hr (40CFR§60.40b(a))
NSPS K - No tank greater than 40,000 gallons (40CFR§60.110(a))
NSPS Ka - No tank greater than 151.416 m3 (40,000 gal) (40CFR§60.110a(a))
NSPS GG - No stationary gas turbine (40CFR§60.330(a))
NSPS VV - Not a synthetic organic chemicals plant (40CFR§60.480(a))
NSPS VVa - Not a sythentic organic chemicals plant (40CFR§60.480a(a))
NSPS GGG - Not a petroluem refinery (40CFR§60.490(a))
NSPS GGGa - Not a petroluem refinery (40CFR§60.490a(a))
NSPS KKK - Facility construction commenced after 08/23/11 (40CFR§60.30(a))
NSPS LLL - No sweetening units on site (40CFR§60.640(a))
NSPS IIII - No stationary compression ignition engine (40CFR§60.4200(a))
NSPS KKKK - No stationary combustion turbine (40CFR§60.4300(a))

NATIONAL EMISSION STANDARDS FOR HAZAROUS AIR POLLUTANTS (NESHAP)

NESHAP HH - Exempt because subject to NSPS OOOO (40CFR§63.769(b))
NESHAP HHH - No natural gas transmission or storage prior to local distribution (40CFR§63.1270(a))
NESHAP YYYY - No stationary gas turbine (40CFR§63.6080(a))
NESHAP ZZZZ - Exempt because subject to NSPS JJJJ (40CFR§63.6590(c)(1)(i))
NESHAP JJJJJJ - Exempt because boilers are gas-fired (40CFR§63.11195(e))

COMPLIANCE ASSURANCE MONITORING (CAM)

CAM - Although a major source that is required to obtain a part 70 or 71 permit, there is no "Pollutant Specific Emissions Unit (PSEU)" with pre-controlled emissions > 100 TPY (40CFR§64.2a))

WEST VIRGINIA AIR QUALITY REGULATIONS

45CSR14 - Permits for Major Sources - Not a Major Source as defined in §45-14-2.43.
45CSR19 - Permits for Major Sources - Does not cause or contribute to nonattainment as per §45-19-3.2.
45CSR21 - Control of VOCs - Not located in Putnam, Kanawha, Cabell, Wayne, or Wood County
45CSR27 - Exempt because equipment is used in the production and distribution of petroleum products
45CSR28 - Voluntary Emission Trading Program - Applicant chooses not to participate
45CSR29 - Not in Putnam, Kanawha, Cabell, Wayne, or Wood County

☑ Permit Shield

Section 2: Applicable Requirements - Continued

20. Facility-Wide Applicable Requirements

List all facility-wide applicable requirements. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number.
(Note: Title V permit condition numbers alone are not the underlying applicable requirements).

R13-2892G includes the following facility-wide requirements:

2.5.1 Construct and operate in accordance with the plans and specifications filed in Permit Applications.
3.1.1 Open burning [45CSR§6-3.1] - Open burning is prohibited.
3.1.3 Asbestos [45CSR§34] - Inspect prior to demolition or renovation.
3.1.4 Odors [45CSR§4-3.1] - No objectionable odors beyond the fence-line.
3.4.2 Odors [45CSR§4] - Maintain records of odor complaints and corrective actions.
3.5.4.1 Emissions Statement [45CSR§30] - Submit annual emissions statement and fees.
4.1.3 Operation and Maintenance of Air Pollution Control Equipment [45CSR§13-5.11]
- Install, maintain, and operate all APCE to minimize emissions and comply w/ limitations.

☑ **Permit Shield**

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

R13-2892G includes the following monitoring, testing, recordkeeping, and reporting requirements:

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

Are you in compliance with all facility-wide applicable requirements? ☑ Yes ☐ No
If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F.** **(Not Applicable)**

Section 2: Applicable Requirements - Continued

21. Active Permits/Consent Orders

Permit or Consent Order Number	Date of Issuance MM/DD/YYYY	List any Permit Determinations that Affect the Permit (if any)
R30-05100141-2015 (AA02) (Title V)	03/26/2019	Modified Permit R30-05100141-2015 (AA01)
R13-2892G (NSR)	03/13/2019	Supersedes and Replaces NSR Permit 2892F
G60-C069 (General Permit)	03/31/2015	Initial EmGen General Permit Registration

22. Inactive Permits/Obsolete Permit Conditions

Permit Number	Date of Issuance MM/DD/YYYY	Permit Condition Number
R30-05100141-2015 (AA01) (Title V)	06/15/2017	Modified Permit R30-05100141-2015
R13-2892F (NSR)	06/01/2017	Supersedes and Replaces NSR Permit 2892E
R13-2892E (NSR)	03/21/2017	Supersedes and Replaces NSR Permit 2892D
R13-2892D (NSR)	10/19/2015	Supersedes and Replaces NSR Permit 2892C
R30-05100141-2015 (Title V)	10/10/2015	Initial Title V Permit R30-05100141-2015
R13-2892C (NSR)	05/28/2013	Supersedes and Replaces NSR Permit 2892B
R13-2892B (NSR)	03/05/2013	Supersedes and Replaces NSR Permit 2892A
R13-2892A (NSR)	02/07/2013	Supersedes and Replaces NSR Permit 2892
R13-2892 (NSR)	05/15/2012	Name Change to Williams Ohio Valley Midstream
R13-2892 (NSR)	12/28/2011	Initial NSR Permit to Caiman Eastern Midstream

Section 3: Facility-Wide Emissions

23. Facility-Wide Emissions Summary [Tons per Year]	R13-2892G and G60-C069
Criteria Pollutants	**Potential Emissions (Including Fugitives)**
Carbon Monoxide (CO)	146.38
Nitrogen Oxides (NOX)	79.16
Lead (Pb)	---
Particulate Matter (PM2.5)[1]	5.75
Particulate Matter (PM10)[1]	5.75
Total Particulate Matter (TSP)	5.75
Sulfur Dioxide (SO2)	0.45
Volatile Organic Compounds (VOC)	214.60
Hazardous Air Pollutants[2]	**Potential Emissions (Including Fugitives)**
Benzene	0.18
Ethylbenzene	0.09
Formaldehyde (HCHO)	0.08
n-Hexane	11.74
Methanol (MeOH)	0.01
Toluene	0.61
2,4-Trimethylpentane (TMP, i-Octane)	0.37
Xylenes	1.57
Other/Trace (1,3-Butadiene, Polycyclic Organic Matter (POM), etc.	0.01
Total HAP	14.66
Greenhouse Gases (GHGs)	**Potential Emissions (Including Fugitives)**
Carbon Dioxide (CO2)	114,395
Methane (CH4)	9.61
Nitrous Oxide (N2O)	0.22
Hydrofluorocarbons (HFCs)	---
Perfluorocarbons (PFCs)	---
Sulfur hexafluoride (SF6)	---
CO2 equivalent (CO2e)	114,702
Regulated Pollutants other than Criteria, HAP, and GHG	**Potential Emissions (Including Fugitives)**
na	---

[1] *PM2.5 and PM10 are components of TSP.*

[2] *For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.*

Section 4: Insignificant Activities

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

Please see SUPPLEMENT 07 - Storage Tank Data Sheet (Insignificant Emission Units)

Source ID	Description	Capacity	Thru-Put	VOC	
		gal	gal/yr	lb/hr	lb/yr
TKS (3S)	Pressure Vessels and Spheres	Totally Enclosed - No Emissions			
	Diesel Storage Tank	520	6,240	4E-03	32
	Gasoline Storage Tank	520	6,240	0.07	641
	Methanol Storage Tank	300	3,600	3E-03	29
	Mercaptan Pressure Vessels	Totally Enclosed - No Emissions			
Total "Misc" Storage Tanks		1,340	16,080	0.08	702

Section 4: Insignificant Activities

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

☑ 20 Emission units which do not have any applicable requirements and which emit hazardous air pollutants into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year aggregate total for all HAPs from all emission sources. This limitation cannot be used for any source which emits dioxin/furans nor for toxic air pollutants as per 45CSR27

Please specify all emission units for which this exemption applies along with the quantity of hazardous air pollutants emitted on an hourly and annual basis:

Please see SUPPLEMENT 07 - Storage Tank Data Sheet

Source ID	Description	Capacity	Thru-Put	HAP	
		gal	gal/yr	lb/hr	lb/yr
TKS (3S)	Pressure Vessels and Spheres	Totally Enclosed - No Emissions			
	Diesel Storage Tank	520	6,240	9E-04	na
	Gasoline Storage Tank	520	6,240	0.02	160
	Methanol Storage Tank	300	3,600	3E-03	29
	Mercaptan Pressure Vessels	Totally Enclosed - No Emissions			
Total "Misc" Storage Tanks		1,340	16,080	0.02	197

☐	21	Environmental chambers not using hazardous air pollutant (HAP) gases.
☑	22	Equipment on the premises of industrial and manufacturing operations used solely for the purpose of preparing food for human consumption.
☐	23	Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.
☑	24	Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.
☑	25	Equipment used for surface coating, painting, dipping or spray operations, except those that will emit VOC or HAP.
☑	26	Fire suppression systems.
☑	27	Firefighting equipment and the equipment used to train firefighters.
☐	28	Flares used solely to indicate danger to the public.
☑	29	Fugitive emission related to movement of passenger vehicle provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted.
☐	30	Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.
☑	31	Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.
☐	32	Humidity chambers.
☑	33	Hydraulic and hydrostatic testing equipment.
☐	34	Indoor or outdoor kerosene heaters.
☑	35	Internal combustion engines used for landscaping purposes.
☐	36	Laser trimmers using dust collection to prevent fugitive emissions.
☐	37	Laundry activities, except for dry-cleaning and steam boilers.
☑	38	Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.
☑	39	Oxygen scavenging (de-aeration) of water.
☐	40	Ozone generators.

Section 4: Insignificant Activities

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

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

25. Equipment Table
Fill out the **Title V Equipment Table** and provide it as **ATTACHMENT D**.
26. Emission Units
For each emission unit listed in the **Title V Equipment Table**, fill out and provide an **Emission Unit Form** as **ATTACHMENT E**.
For each emission unit not in compliance with an applicable requirement, fill out a Schedule of Compliance Form as **ATTACHMENT F. (Not Applicable)**
27. Control Devices
For each control device listed in the **Title V Equipment Table**, fill out and provide an **Air Pollution Control Device Form** as **ATTACHMENT G**.
For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Title V Major Source Threshold Level, refer to the Compliance Assurance Monitoring (CAM) Form(s) for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as Attachment H. **(Not Applicable)**

Section 6: Certification of Information

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

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

a. Certification of Truth, Accuracy and Completeness

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

b. Compliance Certification

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

Responsible official (type or print)	
Paul V. Hunter	**Title:** Vice President

Responsible official's signature:

Signature: DocuSigned by: Paul Hunter F45E54934CAD4B9 Signature Date: 5/6/2020

(Must be signed and dated in blue ink)

Note: Please check all applicable attachments included with this permit application:	
☑	ATTACHMENT A: Area Map
☑	ATTACHMENT B: Plot Plan(s)
☑	ATTACHMENT C: Process Flow Diagram(s)
☑	ATTACHMENT D: Equipment Table
☑	ATTACHMENT E: Emission Unit Form(s)
☐	ATTACHMENT F: Schedule of Compliance Form(s) **(Not Applicable)**
☑	ATTACHMENT G: Air Pollution Control Device Form(s)
☐	Attachment H: Compliance Assurance Monitoring (CAM) Form(s) (Not Applicable)

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

Attachment A

Area (Topographic) Map

Provide an Area Map showing plant location as Attachment A.

- Area Map – Moundsville Fractionation Plant
- USGS Topographic Map – Businessburg Quadrangle OH-WV

- **Address:**
  200 Caiman Drive
  Moundsville, Marshall Co, WV 26041

- **Latitude and Longitude:**
  39°54'46.5" N x -80°47'49.3" W
  39.91291° N x -80.79704° W

- **UTM Coordinates:**
  517.35 km E x 4,418.11 km N x Zone: 17S

- **USGS:**
  7.5 Minute Topographic – Businessburg, OH-WV

- **Elevation:**
  ~650 Feet

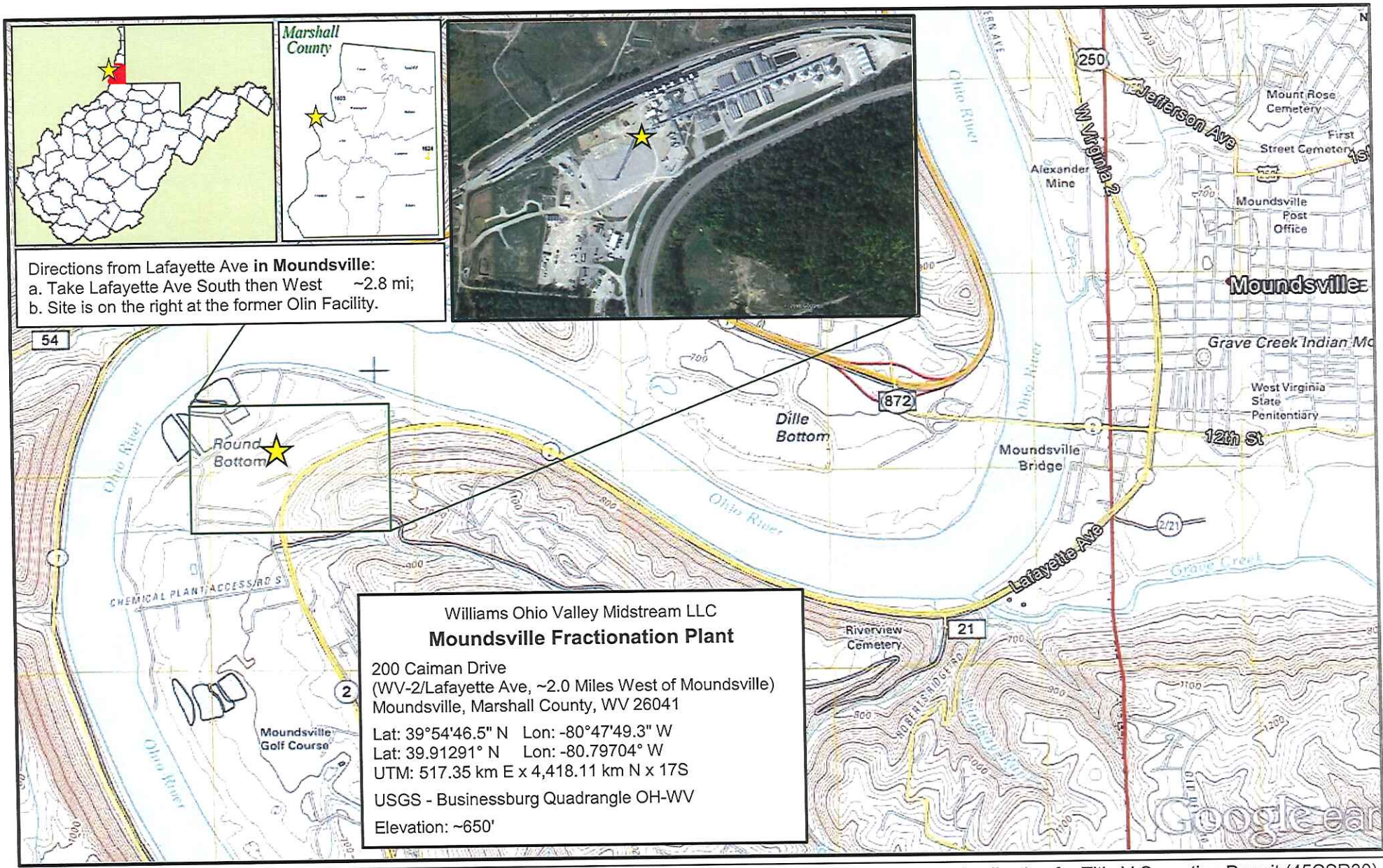
- **Directions:**
  From Lafayette Ave in Moundsville:
  a. Take Lafayette Ave South then West ~2.8 mi;
  b. Site is on the right at the former Olin Facility.

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Operating Permit (45CSR30)

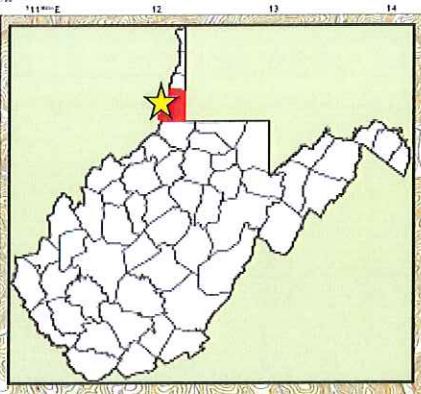
Attachment A - Area (Topographic) Map

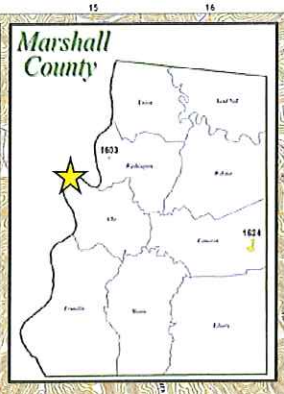


USGS science for a changing world
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

BUSINESSBURG QUADRANGLE
OHIO - WEST VIRGINIA
7.5-MINUTE SERIES





Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

200 Caiman Drive
(WV-2/Lafayette Ave, ~2.0 Miles West of Moundsville)
Moundsville, Marshall County, WV 26041

Lat: 39°54'46.5" N Lon: -80°47'49.3" W
Lat: 39.91291° N Lon: -80.79704° W
UTM: 517.35 km E x 4,418.11 km N x Zone 17S)

USGS - Businessburg Quadrangle OH-WV

Elevation: ~650'

Directions from Lafayette Ave **in Moundsville**:
a. Take Lafayette Ave South then West ~2.8 mi;
b. Site is on the right at the former Olin Facility.

Produced by the United States Geological Survey

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

BUSINESSBURG, OH, WV
2019

Attachment A' - USGS Topo Map

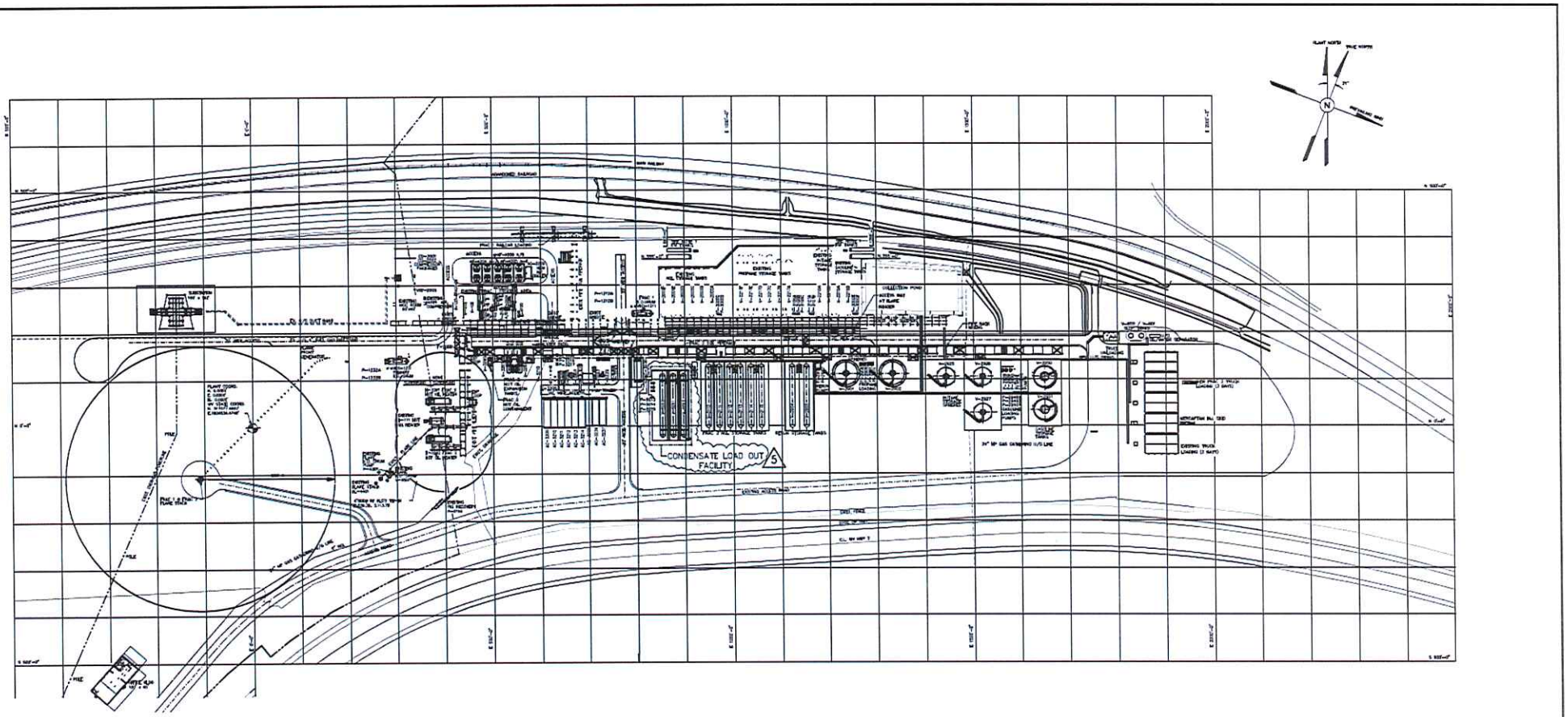
Attachment B

Plot Plans

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

- Plot Plan – Moundsville Fractionation Plant
- Aerial View – Moundsville Fractionation Plant

Attachment B - Plot Plan



1. FIRE WATER TANKS AND PUMPS ARE TO BE RELOCATED BY THE FIELD PRIOR TO INSTALLING THE NEW NGL AND ROR/N STORAGE TANKS.
2. REMOVED COORDINATE LABELING. SEE EQUIPMENT LOCATION PLOT PLANS.
3. REMOVED EXISTING UNDERGROUND DUCT BANK REFERENCES NEAR TRUCK LOADING. SEE CHAPMAN PLAN DRAWINGS.
4. REMOVED EXISTING UNDERGROUND PIPE REFERENCES AT EAST END OF FRAC 1 PIPE RACK. SEE CHAPMAN PLAN DRAWINGS.

REF. DWG. NO.	REF. DWG. TITLE
MFP-P10-1000	KEY EQUIPMENT PLOT PLAN
CHAPMAN JJ-22	PLAN LAYOUT
CHAPMAN JJ-23	PLAN LAYOUT
CHAPMAN JJ-24	PLAN LAYOUT
CHAPMAN JJ-25	PLAN LAYOUT
CHAPMAN JJ-26	PLAN LAYOUT

REVISION APPROVAL RECORD				REV. A	
DISCIPLINE	BY	DATE	DISCIPLINE	BY	DATE
ARCH.			MECHANICAL		
CIVIL			NUCLEAR		
ELECTRICAL			PIPING		
ENVIRON.			PROCESS		
GEN. ARRANG.			QA/QC		
HVAC			STRUCTURAL		
I & C					

DRAWING STATUS				
ISSUED	REV	DATE	SDE	PDM
PRELIMINARY	A	11-16-12		
APPROVED FOR CONSTRUCTION	B	2-11-13		

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED AND DATED. DESTROY ALL PRINTS BEARING AN EARLIER DATE AND/OR REV NO.

REV	DRAWN BY	DATE REVISED	CHECKED BY	PROJECT ENG'L	APPROVED BY
5	ISSUE FOR CONSTRUCTION				
	RS	04-28-14	NM	DS	DS
4	ISSUED FOR BID				
	RS	03-07-14	NM	DS	DS
3	ISSUED FOR CONDENSATE LOAD OUT APPROVAL				
	RS	2-11-14	NM	DS	DS
2	ISSUED FOR CONSTRUCTION				
1	ISSUED FOR CONSTRUCTION				
	RWM	3-6-13	RWM	ITD	ITD

13-P386
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URS
URS PROJECT NUMBER: 30917

OHIO VALLEY MIDSTREAM LLC
MOUNDSVILLE FRACTIONATOR AND TERMINAL
PLOT PLAN
FRAC 1 & 2 UNITS, PRODUCT STORAGE
MARSHALL COUNTY WEST VIRGINIA

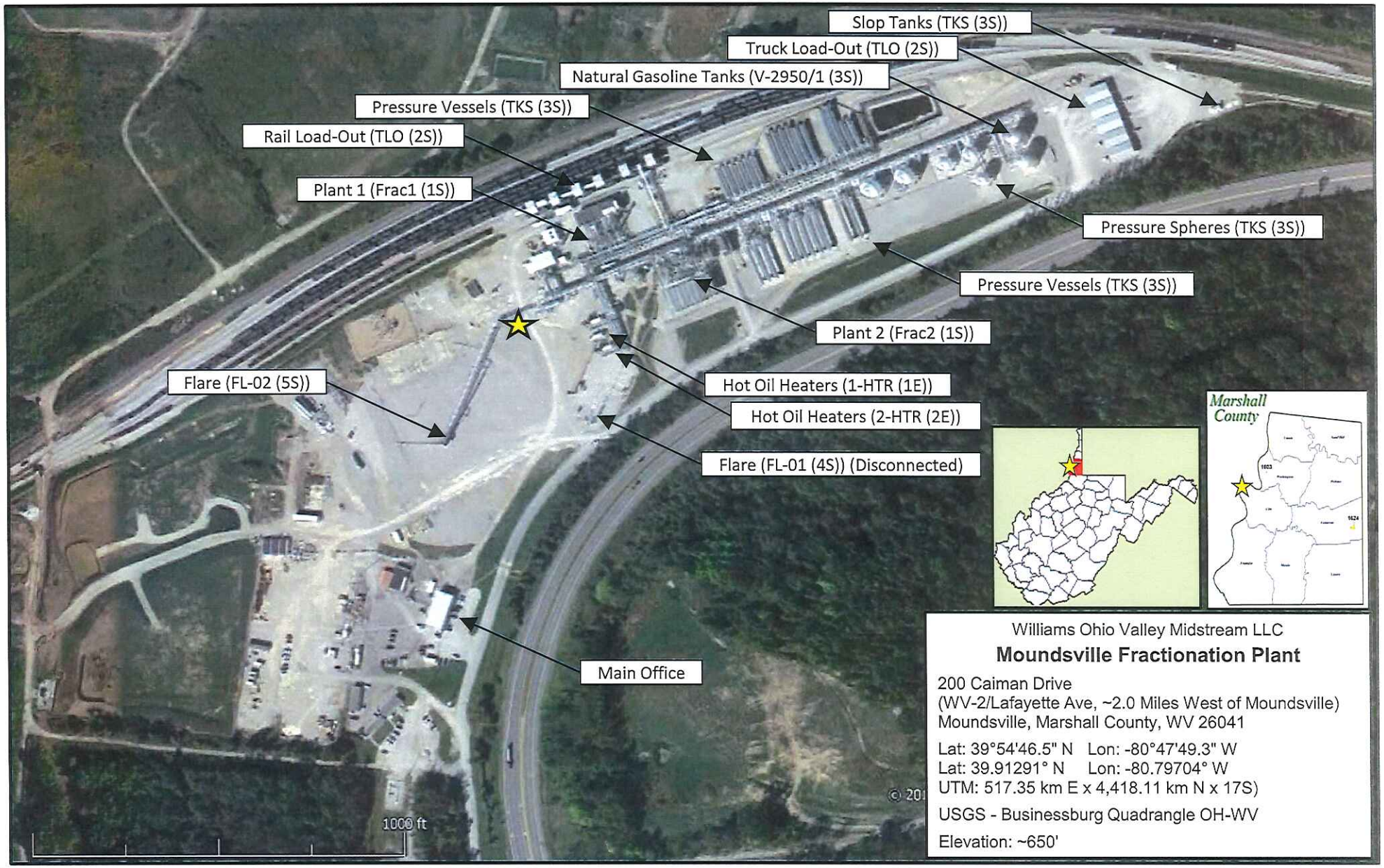
DRAWN BY	TDW	SCALE	1"=100'-0"
CHECKED BY	CAH	A.P.E.I.	
PROJECT ENG'L		DRAWING NO.	MFP-P10-1000
APPROVED BY			5
DATE ISSUED			

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Attachment B' - Aerial View



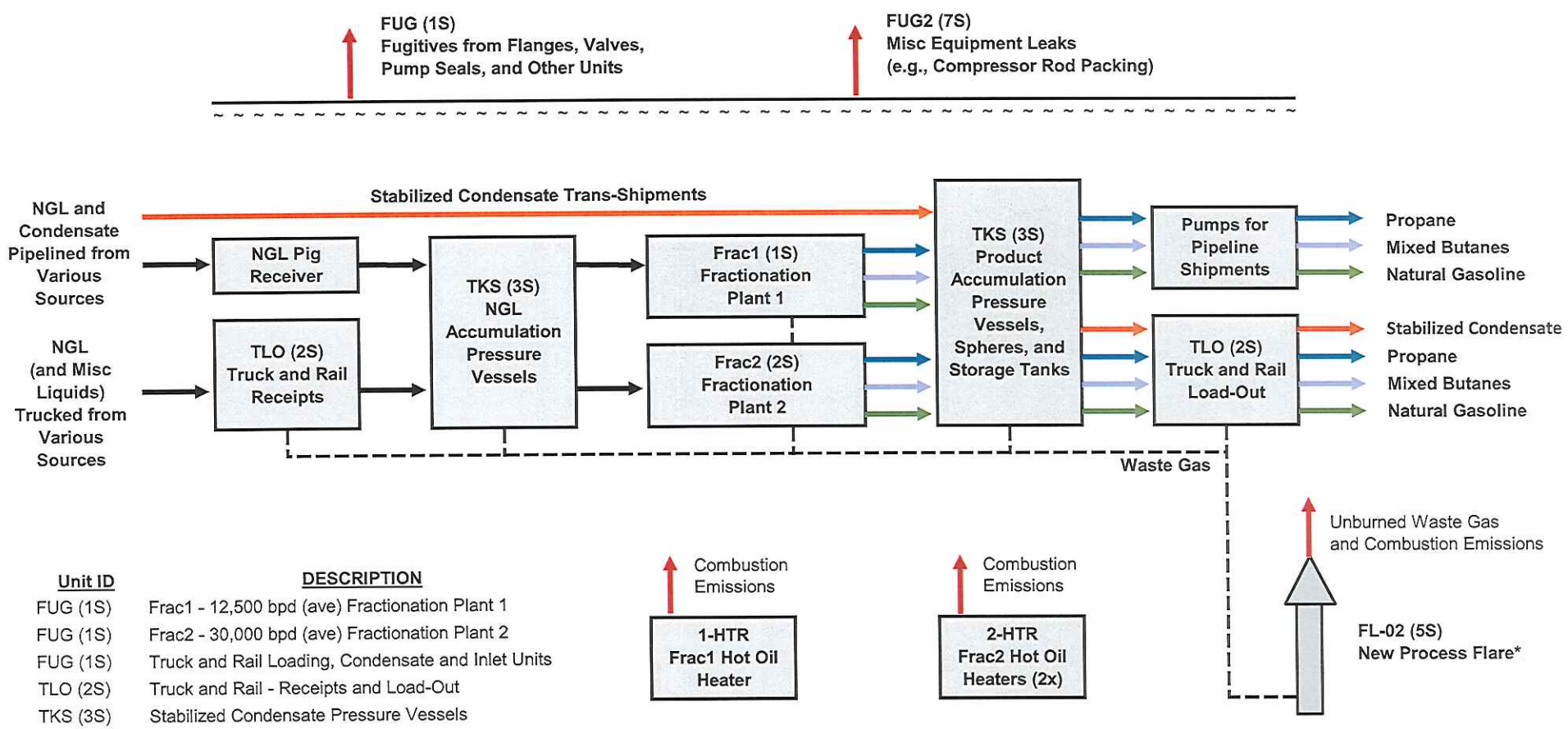
Attachment C

Process Flow Diagram (PFD)

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

- Process Flow Diagram (PFD) – Moundsville Fractionation Plant

Attachment C - Process Flow Diagram (PFD)



Unit ID	DESCRIPTION
FUG (1S)	Frac1 - 12,500 bpd (ave) Fractionation Plant 1
FUG (1S)	Frac2 - 30,000 bpd (ave) Fractionation Plant 2
FUG (1S)	Truck and Rail Loading, Condensate and Inlet Units
TLO (2S)	Truck and Rail - Receipts and Load-Out
TKS (3S)	Stabilized Condensate Pressure Vessels
TKS (3S)	NGL Accumulation Pressure Vessels
TKS (3S)	Propane/Butane Accumulation Pressure Vessels
TKS (3S)	Propane/Butane Accumulation Spheres
TKS (3S)	Natural Gasoline Accumulation Pressure Vessels
(V-2950/1)	Natural Gasoline Accumulation Storage Tanks (2x)
TKS (3S)	Misc Storage Tanks (Diesel, Gasoline, MeOH, Mercaptan)
1-HTR	45.54 MMBtu/hr Frac1 Hot Oil Heater
2-HTR	89.85 MMBtu/hr (ea) Frac2 Hot Oil Heaters (2x)
FL-02 (5S)	620 MMBtu/hr (max) New Process Flare
FUG2 (7S)	Misc Equipment Leaks (e.g., Compressor Rod Packing)
EG-1 (6S)	49.2 bhp Kohler Emergency Generator Engine

***Waste Gas to the New Process Flare:**

Stabilized Condensate Hose Blowdown
Product Loading/Hose Blowdown
Natural Gasoline Tanks w/Butane Blanket
NGL Pig Receiver Blowdowns (250 Events/year)
Hot Oil Expansion Tanks (Fuel/Purge Gas)
Rail Car Degassing (50% C3/C4 + 50% Nat. Gasoline)
Off-Spec Product Flaring (Inlet NGL)
Continuous Flare Purge (Fuel/Purge Gas)
Continuous Flare Pilot (Fuel/Purge Gas)
Maintenance Blowdown

Attachment D

Equipment Table

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

Attachment D - Title V Equipment Table

(Includes all emission units at the facility except those designated as insignificant activities in Section 4, Items 19 and 20 of the General Forms)

Emission Unit ID[1]	Control Device[1]	Emission Point ID[1]	Emission Unit Description	Design Capacity	Installed/ Modified
Moundsville Fractionation Plant - Permitted Under R13-2892G - Issued 03/13/19					
1S	LDAR	na (Fug)	Fractionation Plant 1 (Fugitives Only)	12,500 bpd (ave)	2012
			Fractionation Plant 2 (Fugitives Only)	30,000 bpd (ave)	2013
			Truck Loadout (Fugitives Only)	na	2012
					2013
			Rail Loadout (Fugitives Only)	na	2013
					2016
			Condensate Unit (Fugitives Only)	6,000 bpd (ave)	2014
			Inlet Unit - NGL(Fugitives Only)	na	2012
			Inlet Unit - Condensate (Fugitives Only)	na	2014
2S	FL-02 (5S)	TLO	Truck/Rail (Loading & Unloading)	58,200 bpd (ave)	2012
					2013
3S	Pressure Vessels	TKS	Pressure Vessels andSpheres See Supplement 07 - Storage Tank Data (Insignificant Emissions Units		
V-2950 (3S)	FL-02 (5S)	5E	Natural Gasoline - Storage Tank (2x454.0k)	908,000 gals (total)	2013
V-2951 (3S)					
3S	TKS	TKS	Miscellaneous Storage Tanks (Slop Liquids, Diesel Fuel, Gasoline, Mercaptan) See Supplement 07 - Storage Tank Data (Insignificant Emissions Units		
1-HTR	None	1E	Fractionation Plant 1 - Hot Oil Heater-1	45.54 MMBtu/hr	2012
2-HTR	None	2E	Fractionation Plant 2 - Hot Oil Heater-2a	89.85 MMBtu/hr	2013
			Fractionation Plant 2 - Hot Oil Heater-2b	89.85 MMBtu/hr	2013
FL-02 (5S)	na	5E	New Process Flare (FL-02) (99% DRE)	620 MMBtu/hr	2013
7S	None	na (Fug)	Misc Equipment Leaks (Fugitives Only)	na	2012
Moundsville Fractionation Plant - Permitted Under G60-C069 - Issued 03/31/15					
EG-1 (6S)	None	6E	Emergency Generator Engine (EG-1)	49.2 bhp	2016
			Cold-Start/Crankase (Fugitives Only)	26 events/yr	

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

Attachment E

Emission Unit Forms

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

- Fractionation Plant 1 - Hot Oil Heater-1 (1-HTR (1E))
- Fractionation Plant 2 - Hot Oil Heater-2a/2b (2-HTR (2E))
- New Process Flare (FL-02 (5S) (5E))
- Process Piping Fugitives (1S (FUG))
- Emergency Generator (EG-1 (6S) (6E))
- Natural Gasoline Storage Tanks (V-2950 and V-2951 (3S) (5E))

ATTACHMENT E - Emission Unit Form

Emission Unit Description **1-HTR (1E)**

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
1-HTR (1E)	Fractionation Plant 1 - Hot Oil Heater-1	na

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):
45.54 MMBtu/hr Gas-Fired Hot Oil Heater (1-HTR (1E). Hot Oil provides heat requisite for the fractionation processes.)

No Change to Current Title V Permit R30-05100141-2015 (AA02)

Manufacturer:	**Model number:**	**Serial number(s):**
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2012	na

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
45.54 MMBtu/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
45,098 scf/hr	395 MMBtu/yr	8,760 hr/yr

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? _X_Yes ___ No	**If yes, is it?** ___ Indirect Fired _X_Direct Fired
Maximum design heat input and/or maximum horsepower rating: 45.54 MMBtu/hr	**Type and Btu/hr rating of burners:** 45.54 MMBtu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Commercially available natural gas. 45,098 scf/hr and 395.06 MMscf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.2 grains/100 scf	negligible	1,020 Btu/scf (HHV)
na			

Emission Data

Criteria Pollutants	Pollutant Emissions	
	PPH	TPY
Carbon Monoxide (CO)	3.75	16.43
Nitrogen Oxides (NOX)	4.46	19.56
Lead (Pb)	---	---
Particulate Matter (PM2.5)	0.34	1.49
Particulate Matter (PM10)	0.34	1.49
Total Particulate Matter (TSP)	0.34	1.49
Sulfur Dioxide (SO2)	0.03	0.12
Volatile Organic Compounds (VOC)	0.25	1.08
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	---	---
Acrolein	---	---
Benzene	9E-05	4E-04
Butadiene, 1,3-	---	---
Ethylbenzene	---	---
Formaldehyde	3E-03	0.01
n-Hexane	0.08	0.35
Methanol	---	---
Polycyclic Organic matter (POM/PAH)	---	---
Toluene	2E-04	7E-04
2,2,4-TMP	---	---
Xylenes	---	---
Other HAPs	8E-05	4E-04
Total HAP	0.08	0.37
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	5,327	23,333
Methane (CH4)	0.10	0.44
Nitrous Oxide (N2O)	0.01	0.04
CO2 Equivalent (CO2e)	5,333	23,357

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Vendor data and AP-42

Applicable Requirements

1-HTR (1E)

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

Permit R13-2892G includes the following Frac1 Hot Oil Heater (1-HTR) Limitations and Standards

5.1.1. The maximum design heat input for the Hot Oil Heater (1E) shall not exceed 45.54 MMBTU/hr.

5.1.2. Maximum emissions from the 45.54 MMBTU/hr Hot Oil Heater (1E) shall not exceed the following limits:

Unit ID	Pollutant	Max lb/hr	Max tpy
1-HTR (1E)	NOx	4.51	19.76
	CO	3.79	16.60
	VOC	0.25	1.09

5.1.3. The hourly quantity of natural gas that shall be consumed in the 45.54 MMBTU/hr Hot Oil Heater (1E) shall not exceed 45,098 standard cubic feet per hour.

5.1.4. The annual quantity of natural gas that shall be consumed in the 45.54 MMBTU/hr Hot Oil Heater (1E) shall not exceed 395.06 × 106 standard cubic feet per year.

5.1.9. No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.

_X_ Permit Shield

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

Permit R13-2892G includes the following monitoring/testing/recordkeeping/reporting requirements:

5.1.10. Comply w/ applicable provisions of 40CFR§60.48c (NSPS Dc).

5.4.1. Maintain records of the monthly and rolling 12-month fuel consumption.

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

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

ATTACHMENT E - Emission Unit Form

Emission Unit Description 2-HTR (2E)

Emission unit ID number:	Emission unit name:	List any control devices associated with this emission unit:
2-HTR (2E)	Fractionation Plant 2 - Hot Oil Heater-2a Fractionation Plant 2 - Hot Oil Heater-2b	na

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):
2 x 89.854 MMBtu/hr Gas-Fired Hot Oil Heaters (2-HTR (2E). (Hot Oil provides heat requisite for the fractionation processes.)

No Change to Current Title V Permit R30-05100141-2015 (AA02)

Manufacturer:	Model number:	Serial number(s):
Heatec, Inc.	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2013	na

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
89.85 MMBtu/hr (Each of 2 Units)

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule:
90,392 scf/hr(Each of 2 Units)	952 MMBtu/yr (Total of 2 Units)	8,760 hr/yr

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? _X_Yes ___ No	If yes, is it? ___ Indirect Fired _X_Direct Fired
Maximum design heat input and/or maximum horsepower rating: 108.00 MMBtu/hr (Total of 2 Units)	**Type and Btu/hr rating of burners:** 89.85 MMBtu/hr (Each of 2 Units)

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Commercially available natural gas. 90,392 scf/hr (each) and 952 MMscf/yr (Total)

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.2 grains/100 scf	negligible	1,020 Btu/scf (HHV)
na			

Emission Data

Criteria Pollutants	Pollutant Emissions	
	PPH	TPY
Carbon Monoxide (CO)	6.65	35.00
Nitrogen Oxides (NOX)	3.23	17.03
Lead (Pb)	---	---
Particulate Matter (PM2.5)	0.67	3.52
Particulate Matter (PM10)	0.67	3.52
Total Particulate Matter (TSP)	0.67	3.52
Sulfur Dioxide (SO2)	0.05	0.28
Volatile Organic Compounds (VOC)	0.36	1.89
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	---	---
Acrolein	---	---
Benzene	2E-04	1E-03
Butadiene, 1,3-	---	---
Ethylbenzene	---	---
Formaldehyde	7E-03	0.03
n-Hexane	0.16	0.83
Methanol	---	---
Polycyclic Organic matter (POM/PAH)	---	---
Toluene	3E-04	2E-03
2,2,4-TMP	---	---
Xylenes	---	---
Other HAPs	7E-04	4E-03
Total HAP	0.17	0.88
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	10,480	55,173
Methane (CH4)	0.20	1.04
Nitrous Oxide (N2O)	0.02	0.10
CO2 Equivalent (CO2e)	10,491	55,231

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Vendor data and AP-42

Applicable Requirements

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

Permit R13-2892G includes the following Frac2 Hot Oil Heater (2-HTR) Limitations and Standards

5.1.5. The maximum design heat input for each of the two (2) Hot Oil Heaters (2E) shall not exceed 89.85 MMBTU/hr.

5.1.6. Maximum emissions from the two (2) 89.85 MMBTU/hr Hot Oil Heaters (2E) shall not exceed the following limits:

Unit ID	Pollutant	Max lb/hr	Max tpy
2-HTR (2E)	NOx	3.23	17.03
	CO	6.65	35.00
	VOC	0.36	1.89

5.1.7. The hourly quantity of natural gas that shall be consumed in each of the two (2) 89.85 MMBTU/hr Hot Oil Heaters (2E) shall not exceed 90,392 standard cubic feet per hour.

5.1.8. The annual quantity of natural gas that shall be consumed in both of the two (2) 89.85 MMBTU/hr Hot Oil Heaters (2E) shall not exceed 952 × 106 standard cubic feet per year.

5.1.9. No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.

_X_ Permit Shield

Applicable Requirements

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

Permit R13-2892G includes the following monitoring/testing/recordkeeping/reporting requirements:

5.1.10. Comply w/ applicable provisions of 40CFR§60.48c.

5.4.1. Maintain records of the monthly and rolling 12-month fuel consumption.

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

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

ATTACHMENT E - Emission Unit Form

FL-02 (5S)

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
FL-02 (5S)	New Process Flare	na

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):
The New Process Flare (FL-02 (5S) controls VOC emissions from the Natural Gasoline Tanks (3S), Hot Oil Expansion Tanks, Truck and Rail Car Loading (TLO), Blowdown of the Pig Reciever, and Purge Gas. The New Process Flare (FL-02 (5S) will also be used to control emissions from equipment blowdown for maintenance and repairs.

No Change to Current Title V Permit R30-05100141-2015 (AA02)

Manufacturer:	**Model number:**	**Serial number(s):**
Zeeco	AFTA-24/56	na
Construction date:	**Installation date:**	**Modification date(s):**
2013	2013	na

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
134.49 MMBtu/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
50,517 scf/hr	95.52 MMscf/yr	8,760 hr/yr

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? _X_Yes ___ No (Pilot Gas,Purge Gas, and Waste Gas)	**If yes, is it?** ___ Indirect Fired _X_Direct Fired
Maximum design heat input and/or maximum horsepower rating: 134.49 MMBtu/hr	**Type and Btu/hr rating of burners:** Air assist, 134.49 MMBtu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas for the Pilot and Purge is Included in the Total Heat Input

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.2 grains/100 scf	negligible	1,020 Btu/scf (HHV)
Waste Gas	0.2 grains/100 scf	negligible	2,662 Btu/scf (HHV)
na			

Criteria Pollutants	Pollutant Emissions	
	PPH	TPY
Carbon Monoxide (CO)	170.81	84.46
Nitrogen Oxides (NOX)	85.56	42.31
Lead (Pb)	---	---
Particulate Matter (PM2.5)	1.48	0.73
Particulate Matter (PM10)	1.48	0.73
Total Particulate Matter (TSP)	1.48	0.73
Sulfur Dioxide (SO2)	0.12	0.06
Volatile Organic Compounds (VOC)	280.00	140.06
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	---	---
Acrolein	---	---
Benzene	0.19	0.10
Butadiene, 1,3-	---	---
Ethylbenzene	0.09	0.05
Formaldehyde	0.05	0.02
n-Hexane	11.23	5.83
Methanol	---	---
Polycyclic Organic matter (POM/PAH)	---	---
Toluene	0.52	0.27
2,2,4-TMP	0.39	0.20
Xylenes	1.86	0.96
Other HAPs	0.00	0.00
Total HAP	14.32	7.43
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	72,526	35,861
Methane (CH4)	8.35	4.33
Nitrous Oxide (N2O)	0.14	0.08
CO2 Equivalent (CO2e)	72,775	35,992

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Vendor data NSPS Aand AP-42

Applicable Requirements FL-02 (5S)

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

Permit R13-2892G includes the following Flare 02 (FL-02 (5S) Limitations and Standards

6.1.1 Install and operate a Flare (5S) designed to achieve, at a minimum, a 99.0% destruction and removal efficiency (DRE) of VOCs and organic HAPS from the following sources:

Stabilized Condensate Hose Blowdown;
Product Loading/Hose Blowdown;
Natural Gasoline Tanks w/Butane Blankets;
NGL Pig Receiver Blowdowns (250 Events/year);
Hot Oil Expansion Tanks (Fuel/Purge Gas);
Rail Car Degassing (50% C3/C4 + 50% Natural Gasoline);
Off-Spec Product Flaring (Inlet NGL);
Continuous Flare Purge (Fuel/Purge Gas); and
Continuous Flare Pilot (Fuel/Purge Gas).

6.1.2. Emissions from the Frac1 Hot Oil Heater (2-htr) shall not exceed the following:

Unit ID	Pollutant	Max lb/hr	Max tpy
FL-02 (1S)	NOx	85.56	42.31
	CO	170.81	84.46

6.1.3. The maximum emissions of VOCs and HAPs at the flare (representing un-combusted pass-through organic vapors that are generated at one of the sources identified under condition 5.1.1.) shall not exceed the following limits:

Unit ID	Pollutant	Max lb/hr	Max tpy
FL-02 (1S)	VOC	280.00	140.06
	Benzene	0.19	0.10
	Ethylbenzane	0.09	0.05
	n-Hexane	11.23	5.83
	Toluene	0.52	0.27
	2,2,4-TMP	0.39	0.20
	Xylenes	1.86	0.96
	Total HAPs	14.32	7.43

6.1.4. The maximum aggregate amount of waste gases sent to the Flare (5S) from the sources identified under condition 5.1.1. shall not exceed 192.66 mmscf/yr.

6.1.5. The installed Flare (5S) shall be a Zeeco Model Number AFTA-24/56, shall have a maximum waste-gas capacity of 28,000 lb/hr, shall have an MDHI of 620 mmBtu/hr, and shall be operated in as follows:
a. Air Assisted.
b. No visible emmissions,except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.
c. Flame presnet whenever emissions may be vented exept dutonf SSM.
d. Used only when the net heating valuee of the waste gas is 11.2 MJ/scm (300 Btu/scf) or greater.

_X_ Permit Shield

Applicable Requirements

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

Permit R13-2892G includes the following monitoring/testing/recordkeeping/reporting requirements:

6.2.1. Monitor the presence or absence of a flare pilot flame using a thermocouple or equivalent.

6.2.2. Monitor thruput to the flare on a monthly basis.

6.3.1. Conduct Method 22 opacity test w/in 1 yr of permit issuance.

6.4.1. Maintain records of times and duration when pilot flame is absent.

6.4.2. Maintain records of the flare design evaluation.

6.4.3. Maintain records of the flare opacity testing.

6.4.4. Maintain records of the monthly thruput.

6.4.5. Maintain records of the flare opacity testing.

6.4.6. Required records shall be maintained for a period of 5 yrs.

6.4.6'. Any record submitted to WVDEP shall be certified by a Responsible Official.

6.5.2. Report any deviations from allowable visible emission requirements.

6.5.2'. Report any deviations from the flare design and operation criteria.

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

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

ATTACHMENT E - Emission Unit Form

Emission Unit Description — **Frac1 and Frac2 (1S) (FUG)**

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
Frac1 and Frac2 (1S) (FUG)	Fugitive Emissions from Piping, Valves, Fittings, Etc	na

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):
Fugitive emissions from valves, flanges, connectors, relief valves, and pump seals.

No Change to Current Title V Permit R30-05100141-2015 (AA02)

Manufacturer:	**Model number:**	**Serial number(s):**
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	Frac1 = 2012 Frac2 = 2013	na

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
1,785,000 gal/day (Total Frac1 and Frac2)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
74,375 gal/hr	651,525,000 gal/yr (total)	8,760 hr/yr

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ___Yes _X_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: na	**Type and Btu/hr rating of burners:** na

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
na

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
na			

Emission Data

Frac1 and Frac2 (1S) (FUG)

Criteria Pollutants	Pollutant Emissions	
	PPH	TPY
Carbon Monoxide (CO)	---	---
Nitrogen Oxides (NOX)	---	---
Lead (Pb)	---	---
Particulate Matter (PM2.5)	---	---
Particulate Matter (PM10)	---	---
Total Particulate Matter (TSP)	---	---
Sulfur Dioxide (SO2)	---	---
Volatile Organic Compounds (VOC)	15.33	67.13
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	---	---
Acrolein	---	---
Benzene	0.02	0.08
Butadiene, 1,3-	---	---
Ethylbenzene	0.01	0.03
Formaldehyde	---	---
n-Hexane	1.08	4.72
Methanol	---	---
Polycyclic Organic matter (POM/PAH)	---	---
Toluene	0.07	0.29
2,2,4-TMP	0.04	0.17
Xylenes	0.13	0.57
Other HAPs	---	---
Total HAP	1.34	5.85
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	---	---
Methane (CH4)	0.77	3.36
Nitrous Oxide (N2O)	---	---
CO2 Equivalent (CO2e)	19.16	83.91

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Vendor data, NSPS OOOO, and AP-42

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

Permit R13-2892G includes the following Frac1 Hot Oil Heater (2-htr) Limitations and Standards

7.1.1. The maximum NGL processed through the Fractionation Plant 1 (1S) shall not exceed 525,000 gpd and 191,625,000 gpy. The maximum NGL processed through the Fractionation Plant 2 (1S) shall not exceed 1,260,000 gpd and 459,900,000 gpy.

7.1.2. The Product Loading area (1S) at the Fractionating Processing Plant shall be operated in accordance with the plans and specifications filed in Permit Application R13-2892E. The rail and truck loading area will route all vapors to the flare for combustion.

7.1.3. Fugitive emissions of VOCs from equipment leaks at the facility, as calculated from emissions factors taken from Table 2-4 of EPA-453/R-95-017 - "Protocol for Equipment Leak Emission Estimates," shall not exceed 67.13 TPY. Continuing compliance with this limit shall be determined by the following: The permittee shall not exceed the number and type of components (valves, pump seals, connectors, etc.) in gas/vapor or light liquid (as applicable) listed in Permit Application R13-2892G.

7.1.4. This section applies to the group of all equipment, except compressors, within a process unit. As per 40CFR§60.5400 - NSPS OOOO-Onshore Natural Gas Processing Plant

_X_ Permit Shield

Applicable Requirements **Frac1 and Frac2 (1S) (FUG)**

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

Permit R13-2892G includes the following monitoring/testing/recordkeeping/reporting requirements:

7.1.5.b.1 Each pressure relief device must be monitored quarterly and w/in 5 days of each pressure release.

7.1.5.b.2 If an instrument reading of 500 ppm or greater is measured, a leak is detected.

7.1.5.b.3.i. Leaks shall be repaired as soon as practical, but in no case more than 15 days after leak detection.

7.1.5.b.3.ii. A first attempt at repair shall be made w/in 5 days after leak detection.

7.4.2. Submit annual reports containing information specified in the permit.

7.4.3.b. Maintain records of leaks of pressure relief devices as specified in the permit.

7.4.5. Submit semi-annual reports for pressure relief devices as specified in the permit.

7.5.1. To demonstrate compliance with condition 7.1.1 the permittee shall maintain records of the amount of liquids processed in the Product Loading Area (TLO (2S). Said records required shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

7.5.1'. Required records shall be maintained for a period of 5 yrs.

7.5.1". Any record submitted to WVDEP shall be certified by a Responsible Official.

Comply w/ applicable provisions of 40CFR§60.5415, §60.5420, and §60.5421 - Natural Gas Processing Plant

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

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

ATTACHMENT E - Emission Unit Form

Emission Unit Description — **EmGen (EG-1 (6S) (6E))**

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
EmGen (EG-1 (6S) (6E))	49.2 bhp GM Vortec 3.0L (4SRB) Emergency Generator Engine 01	na

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):
49.2 bhp GM Vortec 3.0L (4SRB) emergency generator engine used to provide electrical power for various activities at the site in the event of loss of purchase power.

No Change to Current Title V Permit R30-05100141-2015 (AA02)

Manufacturer:	**Model number:**	**Serial number(s):**
GM	Vortec 3.0L	tbd
Construction date:	**Installation date:**	**Modification date(s):**
2014	2016	na

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
49.2 bhp @ 1,800 rpm

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
na	na	500 hr/yr

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? _X_Yes ___ No	**If yes, is it?** ___ Indirect Fired _X_Direct Fired
Maximum design heat input and/or maximum horsepower rating: 49.2 bhp	**Type and Btu/hr rating of burners:** 7,660 Btu/bhp-hr (LHV)

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas – 410 scfh and 0.21 MMscf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
Natural Gas	0.25 grains/100 scf	negligible	1,020 Btu/scf (HHV)
Propane	0.25 grains/100 scf	negligible	2,516 Btu/scf (HHV)
na			

Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	41.98	10.49
Nitrogen Oxides (NOX)	1.08	0.27
Lead (Pb)	---	---
Particulate Matter (PM2.5)	0.01	3E-03
Particulate Matter (PM10)	0.01	3E-03
Total Particulate Matter (TSP)	0.01	3E-03
Sulfur Dioxide (SO2)	4E-04	9E-05
Volatile Organic Compounds (VOC)	0.05	0.01
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	1.08	0.27
Acrolein	1.08	0.27
Benzene	1E-03	2E-04
Butaqdiene, 1,3-	---	---
Ethylbenzene	2E-05	4E-06
Formaldehyde	0.01	3E-03
n-Hexane	---	---
Methanol	---	---
Polycyclic Organic matter (POM/PAH)	---	---
Toluene	4E-04	9E-05
2,2,4-TMP	---	---
Xylenes	1E-04	3E-05
Other HAPs	0.01	1E-03
Total HAP	0.02	0.01
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	73.43	18.36
Methane (CH4)	0.14	0.04
Nitrous Oxide (N2O)	1E-04	3E-05
CO2 Equivalent (CO2e)	77.08	19.27

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Vendor data, NSPS JJJJ, and AP-42

Applicable Requirements

EmGen (EG-1 (6S) (6E))

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

Permit G60-C069 (General Permit) includes the following Emergency Generator (EG-1 (6S/6E)
Limitations and Standards

5.1.2 Emission Limitations. The registrant shall not cause, suffer, allow or permit emissions of NOX, and CO, from any registered reciprocating internal combustion engine to exceed the potential to emit (pounds per hour and tons per year) listed in the General Permit Registration.

Unit ID	Pollutant	Max lb/hr	Max tpy
EG-1 (6S/6E)	NOx	1.08	0.27
	CO	41.98	10.49

Based on operating engine 50 hrous/yr

5.1.2. The spark ignition engine 6S is registered under Class II General Permit G60-C (Appendix A) and is subject to Sections 1.0, 2.0, 3.0, and 4.0 of the General Permit.

The following sections of Class II General Permit G60-C (Appendix A) apply to 6S:

Section 5 Reciprocating Internal Combustion Engines (R.I.C.E.) – Applicable substantive requirements are in General Permit G60-C conditions 5.1.1., 5.1.2., 5.1.3., 5.3.1., 5.4.1., and 5.5.1.

Section 8 Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (40 C.F.R. 60 Subpart JJJJ) – Applicable substantive requirements are in General Permit G60-C conditions 8.1.1.a.4., 8.2.3., 8.2.9., 8.3.4., 8.3.9., 8.4.1., 8.4.4., 8.6.1.a., and 8.6.1.b.

5.1.3. Maximum Fuel Consumption Limitation. The maximum fuel consumption for any registered reciprocating internal combustion engine listed in the General Permit Registration application shall not exceed the fuel consumption recorded with registrant's Class II General Permit Registration Application (0.09 MMscf/yr) without effecting a modification or administrative update. Compliance with the Maximum Yearly Fuel Consumption Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the fuel consumption at any given time during the previous twelve consecutive calendar months.

Permit R13-2892G requires compliance with NSPS JJJJ Limitations and Standards

_X_ Permit Shield

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

Permit G60-C069 (General Permit) includes the following monitoring/testing/recordkeeping/reporting requirements:

7.3.1. See Section 5.3.1. of Class II Emergency Generator General Permit G60-C (Appendix A).

7.4.1. Maintain monthly records of the amount of fuel consumed by the engine to demonstrate compliance with the hourly and annual emission limits in condition 7.1.1. Compliance with annual emission limits shall be based on a 12-month rolling total.

7.4.2. Maintain monthly records of the hours of operation of the engine to demonstrate compliance with the emissions and operating limitations in condition 7.1.1. Compliance with annual operating limitation shall be based on a 12-month rolling total.

7.4.3. See Sections 8.4.1., 8.6.1.a., and 8.6.1.b. of Class II Emergency Generator General Permit G60-C (Appendix A).

Permit R13-2892G requires compliance with NSPS JJJJ monitoring/testing/recordkeeping/reporting requirements

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

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

ATTACHMENT E - Emission Unit Form

V-2950 and V-2951 (5E)

Emission Unit Description

Emission unit ID number: V-2950 and V2951 (3S) (5E)	**Emission unit name:** Two (2) 454,000 gallon capacity Natural Gasoline Storage Tanks	**List any control devices associated with this emission unit:** FL-02 (5S) (5E)

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):
Two (2) 454,000 gallon capacity Natural Gasoline Storage Tanks (V-2950, V-2951)

No Change to Current Title V Permit R30-05100141-2015 (AA02)

Manufacturer: na	**Model number:** na	**Serial number(s):** tbd
Construction date: na	**Installation date:** 2013	**Modification date(s):** na

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
908,000 gal (Total for Both Tanks)

Maximum Hourly Throughput: na	**Maximum Annual Throughput:** na	**Maximum Operating Schedule:** 8,760 hr/yr

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ___Yes _X_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: na	**Type and Btu/hr rating of burners:** na

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
na

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max Sulfur Content	Max Ash Content	BTU Value
na			

Emission Data

Criteria Pollutants	Pollutant Emissions	
	PPH	TPY
Carbon Monoxide (CO)	No Emissions Except Fugitives (FUG (1S)) and Tank Losses to Flare (FL-02 (5S))	
Nitrogen Oxides (NOX)		
Lead (Pb)		
Particulate Matter (PM2.5)		
Particulate Matter (PM10)		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO2)		
Volatile Organic Compounds (VOC)		

Hazardous Air Pollutants	Pollutant Emissions	
	PPH	TPY
Acetaldehyde	No Emissions Except Fugitives (FUG (1S)) and Tank Losses to Flare (FL-02 (5S))	
Acrolein		
Benzene		
Butaqdiene, 1,3-		
Ethylbenzene		
Formaldehyde		
n-Hexane		
Methanol		
Polycyclic Organic matter (POM/PAH)		
Toluene		
2,2,4-TMP		
Xylenes		
Other HAPs		
Total HAP		

Regulated Pollutants other than Criteria and HAP	Pollutant Emissions	
	PPH	TPY
Carbon Dioxide (CO2)	No Emissions Except Fugitives (FUG (1S)) and Tank Losses to Flare (FL-02 (5S))	
Methane (CH4)		
Nitrous Oxide (N2O)		
CO2 Equivalent (CO2e)		

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

SPS Ka and EPA TANKS 4.0.9d

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

Permit R13-2892G requires compliance with NSPS Kb Limitations and Standards

_X_ Permit Shield

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

Permit R13-2892G requires compliance with NSPS Kb monitoring/testing/recordkeeping/reporting requirements

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

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

Attachment F

Compliance Schedule

(Not Applicable)

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

ATTACHMENT F - Schedule of Compliance Form

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

1. Applicable Requierment:

na

Units:	**Applicable Requirement:**
na	na

NOT APPLICABLE

2. Reason for Noncompliance:

na

3. How will Compliance be Achieved?:

na

4. Consent Order Number (if applicable):

na

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

na

Remedial Measure or Action	Date to be Achieved
na	na

6. Submittal of Progress Reports.

na

Content of Progress Report:	**Report starting date:**
na	na
	Submittal frequency:

Attachment G

Air Pollution Control Devices (APCD) Forms

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

- New Process Flare (FL-02 (5S))

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number:	**List all emission units associated with this control device.**
FL-02 (5S/5E)	Stabilized Condensate Hose Blowdown; Product Loading/Hose Blowdown; Natural Gasoline Tanks w/Butane Blankets; NGL Pig Receiver Blowdowns (250 Events/year); Hot Oil Expansion Tanks (Fuel/Purge Gas); Rail Car Degassing (50% C3/C4 + 50% Natural Gasoline); Off-Spec Product Flaring (Inlet NGL); Continuous Flare Purge (Fuel/Purge Gas); Continuous Flare Pilot (Fuel/Purge Gas); and Maintenance Blowdown.

Manufacturer:	**Model number:**	**Installation date:**
Zeeco	AFTA-20/56	2014

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multicyclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	**_X_ Flare**	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

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

Pollutants	Capture Efficiency	Control Efficiency
NOX	---	---
CO	---	---
VOC	100.0%	99.0%
SO2	---	---
PM10/2.5	---	---
Benzene	100.0%	99.0%
Ethylbenzene	100.0%	99.0%
HCHO	---	---
n-Hexane	100.0%	99.0%
Toluene	100.0%	99.0%
2,2,4-TMP	100.0%	99.0%
Xylenes	100.0%	99.0%
Other HAP	100.0%	99.0%
Total HAP	100.0%	99.0%
CO2	---	---
CH4	100.0%	99.0%
N2O	---	---
CO2e	---	---

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

Minimum waste heat content > 300 Btu/scf

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _X_ No

If Yes, Complete Attachment H

If No, Provide justification.

This is the control device used to comply with NSPS OOOO.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

Thermocouple and auto-ignition of the pilot flame.

Attachment H

Compliance Assurance Monitoring (CAM)

(Not Applicable)

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

Attachment H - Compliance Assurance Monitoring (CAM) Plan Form

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

CAM APPLICABILITY DETERMINATION

1) Does the facility have a PSEU (Pollutant-Specific Emissions Unit) considered separately with respect to **EACH** regulated air pollutant that is subject to CAM (40 CFR Part 64), which must be addressed in this CAM plan submittal?

☐ YES **NO**

NOT APPLICABLE

To determine applicability, a PSEU must meet **all** of the following criteria.
(If No, then the remainder of this form need not be completed):

a. The PSEU is located at a major source that is required to obtain a Title V permit;

b. The PSEU is subject to an emission limitation or standard for the applicable regulated air pollutant that is NOT exempt;
LIST OF EXEMPT EMISSION LIMITATIONS OR STANDARDS:

- NSPS (40 CFR Part 60) or NESHAP (40 CFR Parts 61 and 63) proposed after 11/15/1990.
- Stratospheric Ozone Protection Requirements.
- Acid Rain Program Requirements.
- Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR 64.1.
- An emission cap that meets the requirements specified in 40 CFR 70.4(b)(12).

c. The PSEU uses an add-on control device (as defined in 40 CFR §64.1) to achieve compliance with an emission limitation or standard;

d. The PSEU has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than the Title V Major Source Threshold Levels; AND

e. The PSEU is NOT an exempt backup utility power emissions unit that is municipally-owned.

Continued - If Applicable

Supplement 01

Process Description

A. Project Overview
B. Fractionation Process (Fugitives) (Frac1 and Frac2 (1S))
C. Truck Load-Out (TLO (2S))
D. Storage Tanks (TKS (3S))
E. Hot Oil Heaters (1-HTR (1E) and 2-HTR (2E))
F. New Process Flare (FL-02 (5S))
G. Emergency Generator (EmGen-01 (6S))

Supplement 01
Process Description

Williams Ohio Valley Midstream LLC
Moundsville Fractionation Plant
Application for Title V Permit (45CSR30) Renewal

A. Project Overview

Williams Ohio Valley Midstream LLC owns and operates the Moundsville Fractionation Plant (Frac) located along WV Route 2, West of Moundsville, in Marshall County (See Attachment A – Area Map). The facility fractionates the raw NGL through a series of distillation processes (de-propanizers and de-butanizers) to generate three products: propane, mixed butanes, and heavier organic liquids identified as natural gasoline. Total plant capacity is 42,500 bbl/day of NGL.

B. Fractionation Process (Fugitives) (Frac1 and Frac2 (1S))

The fractionation process is totally enclosed; the only emissions are fugitives from piping and equipment. These emissions are controlled by implementation of a leak detection and repair (LDAR) program.

C. Truck Load-Out (TLO (2S))

Loading of NGLs is accomplished under pressure in a totally enclosed system resulting in no emissions to the atmosphere.

D. Storage Tanks (TKS (3S))

Incoming NGL is accumulated in twelve (12) horizontal pressure vessels, half with 61,400-gallon capacity (Frac1) and half with 90,000-gallon capacity (Frac2). The final products (propane, butane, and natural gasoline) and stabilized condensate are accumulated in a series of twenty (20) pressure vessels (horizontal or spherical) ranging from 60,000 to 420,000 gallons capacity. The pressure vessel operations are totally enclosed and do not generate emissions during normal operations.

There are also two (2) 454,000-gallon capacity, vertical, dome roof tanks for natural gasoline accumulation. These tanks are subject to NSPS Subpart Kb regulations with emissions controlled by the new process flare (FL-02 (5S)).

Finally, there is one (1) 1,000 gallon lube oil tank, two (2) 8,820 gallon slop tanks, one (1) 520 gallon diesel fuel tank, one (1) 520 gallon gasoline tank, one (1) 300 gallon methanol tank, two (2) 1,000 gallon mercaptan (odorant) tanks, and two (2) 3,000 mercaptan (odorant) tank; each with de-minimis (or insignificant) emissions.

E. Hot Oil Heaters (1-HTR (1E) and 2-HTR (2E))

A total of three (3) natural gas-fueled hot oil heaters are used at the facility. The hot oil is used as a heat transfer medium in the fractionation plant. These heaters are subject to NSPS Subpart Dc because they are "steam generating units" that heat a transfer medium (i.e., oil). They are not "process heaters" because the hot oil is not used to initiate or promote a chemical reaction as a reactant or catalyst (40CFR§60.41c).

F. New Process Flare (FL-02 (5S))

The new process flare (FL-02 (5S)) will be used to combust natural gas and NGL released from numerous sources, including:

- Stabilized Condensate Hose Blowdown
- Product Loading/Hose Blowdown
- Natural Gasoline Tanks w/Butane Blanket
- NGL Pig Receiver Blowdowns (250 Events/year)
- Hot Oil Expansion Tanks (Fuel/Purge Gas)
- Rail Car Degassing (50% C3/C4 + 50% Natural Gasoline)
- Off-Spec Product Flaring (Inlet NGL)
- Continuous Flare Purge (Purge Gas)
- Continuous Flare Pilot (Fuel Gas)
- Maintenance Blowdown

The total flow rate to the flare will not exceed 192.66 MMscf/yr.

The waste gas is predominately butane (C4) and lighter; accordingly, an estimated control efficiency of 99% is appropriate.

G. Emergency Generator (EmGen-01 (6S))

An emergency generator installed for the purpose of supplying power to allow key systems to continue to operate without interruption during times of utility power outages.

Supplement 02

Regulatory Discussion

A. Applicability of New Source Review (NSR) Regulations

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

B. Applicability of Federal Regulations

1. NSPS A – New Source Performance Standards (NSPS) Subpart A, General Provisions
2. NSPS A, Control Devices – Flares
3. NSPS D, Da, and Db – Steam Generating Units
4. NSPS Dc – Steam Generating Units
5. NSPS K and Ka – Storage Vessels for Petroleum Liquids
6. NSPS Kb – Volatile Organic Liquid Storage Vessels
7. NSPS GG – Stationary Gas Turbines
8. NSPS VV and VVa – Equipment Leaks of VOC in the Synthetic Organic Chemicals
9. NSPS GGG and GGGa – Equipment Leaks of VOC in Petroleum Refineries
10. NSPS KKK – Leaks from Natural Gas Processing Plants
11. NSPS LLL – Onshore Natural Gas Processing: SO2 Emissions
12. NSPS IIII – Compression Ignition Reciprocating Internal Combustion Engines (RICE)
13. NSPS JJJJ – Stationary Spark Ignition (SI) Internal Combustion Engines (ICE)
14. NSPS KKKK – Stationary Combustion Turbines
15. NSPS OOOO – Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced After August 23, 2011, and on or before September 18, 2015
16. NSPS OOOOa – Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015
17. NESHAP Part 61 - Designated Source Standards
18. NESHAP A (Part 63 (aka, MACT)) - General Provisions
19. NESHAP HH – Oil and Natural Gas Production Facilities
20. NESHAP HHH – Natural Gas Transmission and Storage Facilities
21. NESHAP YYYY – Stationary Combustion Turbines
22. NESHAP ZZZZ – Stationary Reciprocating Internal Combustion Engines (RICE)
23. NESHAP DDDDD – Industrial-Commercial-Institutional Boilers and Process Heaters
24. NESHAP JJJJJJ – Industrial-Commercial-Institutional Boilers – Area Sources
25. RMP – Chemical Accident Prevention (and Risk Management Plan)
26. CAM – Compliance Assurance Monitoring
27. GHG – Mandatory Greenhouse Gases (GHG) Reporting

Continued ...

Supplement 02

Regulatory Discussion

-- Continued --

... Continued

C. Applicability of Sources Aggregation

D. Applicability of State Regulations

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

E. Case-by-Case MACT Discussion

Supplement 02
Regulatory Discussion

Williams Ohio Valley Midstream LLC
Moundsville Fractionation Plant
Application for Title V Operating Permit (45CSR30) Renewal

A. Applicability of New Source Review (NSR) Regulations

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

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

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

- NOx: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy
- CO: PSD Natural Minor Source with Pre-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
- GHG/CO2e: Not Applicable for Major Source determination

Important Notes:

* Criteria pollutant fugitive emissions **are not included** in major source determinations because the facility is not an "EPA listed source category".
* Greenhouse gases (GHG) **are not included** as air pollutants for major source determinations.

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

This rule does not apply. The facility is in the Clay Tax District of Marshall County, West Virginia, which is currently classified as Attainment, Unclassified, or Maintenance for all national ambient air quality standards (NAAQS) *except SO2*. The potential to emit (PTE) SO2 PTE is far below the applicable threshold.
(https://www3.epa.gov/airquality/greenbook/wvso2_2010.html)

3. Major Source of Hazardous Air Pollutants (HAPs) [Applicable]

This rule does apply. The facility qualifies as a "HAP Major Source" as follows:

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

Important Note:

* Hazardous air pollutant (HAP) fugitive emissions **are included** in major source determinations regardless of whether the facility is an "EPA listed source category".

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

This rule does apply. The facility is subject to Title V permit requirements because the potential to emit (PTE) VOC is greater than 100 tpy. The facility has the following potential to emit air pollutants:

- NOx: Title V Synthetic Minor Source with Controlled PTE < 100 tpy
- **CO: Title V Major Source with Controlled PTE ≥ 100 tpy**
- **VOC: Title V Major Source with Controlled PTE ≥ 100 tpy**
- SO2: Title V Natural Minor Source with Pre-Controlled PTE < 100 tpy
- PM10/2.5: Title V Natural Minor Source with Pre-Controlled PTE < 100 tpy
- **Each HAP: Title V Major Source with Controlled PTE ≥ 10 tpy**
- Total HAPs: Title V Synthetic Area Source with Controlled PTE < 25 tpy
- GHG/CO2e: Not Applicable for Major Source determinations

Important Notes:

* Criteria pollutant fugitive emissions **are included** in major source determinations. (45CSR30-2.26.b.38 requires fugitive emissions to be included in the major source determination for natural gas processing facilities regardless that the facility is not an "EPA listed source category".)
* Hazardous air pollutant (HAP) fugitive emissions **are included** in major source determinations regardless of whether the facility is an "EPA listed source category".
* Greenhouse gases (GHG) **are not included** as air pollutants for major source determinations.

B. Applicability of Federal Regulations

The following federal regulations are potentially applicable to natural gas liquid (NGL) fractionation plants. Applicability to the facility has been determined as follows:

1. **New Source Performance Standards (NSPS) Subpart A, General Provisions**
40CFR§60.1-§60.19 [Applicable]

This rule does apply to the Hot Oil Heaters (1-HTR (1E) and 2-HTR (2E)) because they are subject to NSPS Dc – Steam Generating Units.

This rule does apply to the two (2) 454,000-gal Natural Gasoline Storage tanks (V-2950 and V-2951 (3S)) because they are subject to NSPS Kb – Volatile Organic Liquid Storage Vessels.

This rule does apply to the Emergency Generator Engine (EmGen (6S) (6E)) because it is subject to NSPS JJJJ – Stationary Spark Ignition (SI) Internal Combustion Engines (ICE).

This rule does apply to the Fractionation Plants (Frac1 and Frac2 (FUG (1S)) because they are subject to NSPS OOOO – Crude Oil and Natural Gas Production, Transmission and Distribution.

Requirements may include:

a. Notification and Recordkeeping (§60.7).
b. Performance Testing (§60.8).
c. Standards and Maintenance (§60.11).
d. Monitoring (§60.13).
e. Notification and Reporting (§60.19).

2. **NSPS A, Control Devices – Flares**
40CFR§60.18(b) [Applicable]

This rule does apply to the New Process Flare (FL-02 (5S) (5E)) because it is used to control VOC emissions to comply with requirements of OOOO – Crude Oil and Natural Gas Production, Transmission and Distribution.

Requirements include:

a. The pilot flame shall be present at all times when emissions may be vented to it.
b. The presence of the pilot flame shall be monitored.
c. The flare shall be operated with no visible emissions except for periods not to exceed a total of five minutes in any two consecutive hours

(40CFR§60.18(c thru f)).

3. **NSPS D, Da, and Db, Steam Generating Units**
40CFR§60.40 -§60.48b [Not Applicable]

These rules do not apply because there is no steam generating unit greater than 100 MMBtu/hr at the facility (§60.40b(a)).

4. **NSPS Dc, Steam Generating Units**
40CFR§60.40c-§60.48c [Applicable]

This rule does apply to the Hot Oil Heaters (1-HTR (1E) and 2-HTR (2E)) because each has a maximum design heat input capacity equal or greater than 10 MMBtu/hr and equal or less than 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)).

5. **NSPS K and Ka, Storage Vessels for Petroleum Liquids**
40CFR§60.110 -§60.117a [Not Applicable]

These rules do not apply because there is no tank at the facility that was constructed before July 23, 1984 (§60.110a(a)).

6. **NSPS Kb, Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984**
40CFR§60.110b-§60.117b [Applicable]

This rule does apply to the two (2) 454,000-gal Natural Gasoline Storage Tanks (V-2950 and V-2951 (~~5E~~3E), with closed vent system and a flare, because each tank stores volatile organic liquids (VOL) and has a design capacity less greater than 75 m3 (19,800 gals or 471 bbl) (§60.110b(a)).

The requirements for each tank with a design capacity greater than or equal to 151 m3 (39,900 gal or 950 bbl) containing a VOL with a maximum true vapor pressure equal to or greater than 5.2 kPa (0.75 psi) but less than 76.6 kPa (11.1 psi) for which construction, reconstruction, or modification commenced after July 23, 1984 include:

a. Equip each storage vessel with one of the following:
   (1) A fixed roof in combination with an internal floating roof.
   (2) An external floating roof.
   (3) A closed vent system and control device.
b. Testing and procedures.
c. Reporting and recordkeeping requirements.
d. Monitoring of operations.

(§60.112b thru (§60.116b)

This rule does not apply to the miscellaneous storage tanks (TKS2 (4S)) because these atmospheric tanks are used to store volatile organic liquids (VOL) and each have a capacity less than 75 m3 (19,800 gal, 472 bbl) (§60.110b(a)).

This rule does not apply to pressure vessels (TKS (3S)) because they are designed to operate in excess of 204.9 kPa (29.71 psi) and with no emissions to the atmosphere (40CFR§60.110b(d)(2)).

7. **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(a)).

8. **NSPS VV and VVa, Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry**
   40CFR§480-§60.489a [Not Applicable]

   These rules do not apply because the facility is not a synthetic organic chemical plant that manufactures or produces one or more of the listed chemicals (§60.480(a) and §60.489(a)).

9. **NSPS GGG and GGGa, Equipment Leaks of VOC in Petroleum Refineries**
   40CFR§490-§60.593a [Not Applicable]

   These rules do not apply because the facility is not a petroleum refinery that processes crude oil removed from the earth or oils derived from tar sands, shale, and coal. (§60.490a(a)).

10. **NSPS KKK, Equipment Leaks of VOC From Onshore Natural Gas Processing Plants for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011**
    40CFR§60.630-§60.636 [Not Applicable]

    This rule does not apply because the facility was constructed after 08/23/11. Note, however, that the facility is subject to the LDAR requirements of NSPS OOOO for natural gas processing facilities.

11. 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)).

12. NPS 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)).

13. NSPS JJJJ, Stationary Spark Ignition (SI) Internal Combustion Engines (ICE)
40CFR§60.4230-§60.4248 [Applicable]

This rule does apply to the Emergency Generator Engine (EmGen (6S)) permitted under General Permit G60-C069 because the maximum power of the engine is greater than 19 KW (25 bhp) and the engine was manufactured on or after 01/01/09 (§60.4230(a)(4)(iv)).

Compliance is achieved by purchasing an EPA Certified Engine and operating the engine in accordance with the manufacturer's emission-related written instructions.

14. 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 (§60.4305(a)).

15. NSPS OOOO, Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced After August 23, 2011 and on or before September 18, 2015
40CFR§60.5360-§60.5430 [Applicable]

This rule does apply to the group of all equipment (except compressors) within Fractionation Plant 1 (Frac1 (1S/FUG)) and Fractionation Plant 2 (Frac2 (1S/FUG)) because they were each constructed, reconstructed, or modified after August 23, 2011 and on or before September 18, 2015 (§60.5365(f)).

Requirements include monitoring and timely repair of each pump, pressure relief device, open-ended valve or line, valve, and flange or other connector that is in VOC service or in wet gas service. The equipment leak standards are specified in 40CFR§60.5400.

This rule does not apply to the two (2) 454,000-gal natural gasoline storage tanks (V-2950 and V-2952 (~~5E~~3E)) because they are subject to and controlled in accordance with the requirements for storage vessels in 40 CFR Part 60, Subpart Kb.

This rule does not apply to the miscellaneous storage tanks (TKS2 (4S)) because each tank does not have the potential to emit greater than 6 tpy of VOC. The only requirement for these miscellaneous storage tanks is to maintain documentation that the actual VOC emission rate is less than 6 tpy per tank (§60.5420(b)(6)(ii) and (§60.5420 (c)(5)(ii)).

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

16. NSPS OOOOa, Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015

40CFR§60.5360a-§60.5430a [Not Applicable]

This rule does not apply because the facility has not commenced construction, modification, or reconstruction after September 18, 2015 (§60.5360a).

17. NESHAP Part 61 - Designated Source Standards

40CFR§61.01-§61.359 [Not Applicable]

This rule does not apply because the facility does not use or produce threshold qualities of any designated hazardous air pollutant (§61.01(a)) or other substances identified to have serious health effects (§61.01 (b)).

Specifically, NESHAP J – Equipment Leaks (Fugitive Emission Sources) of Benzene (§61.110) and NESHAP V - Equipment Leaks (Fugitive Emission Sources) (§61.240) do not apply because all the fluids (gas or liquid) at the subject facility are less than 10 wt% volatile hazardous air pollutant (VHAP) (§61.111 and §61.241).

18. NESHAP A (Part 63 (aka, MACT)) - General Provisions

40CFR§63.1-§63.16 [Applicable]

This rule does apply to the Hot Oil Heaters (1-HTR (1E) and 2-HTR (2E)) because they are is subject to NESHAP DDDDD – Industrial, Commercial, and Institutional Boilers and Process Heaters – Major Sources.

Requirements may include:

a. Prohibited Activities (§63.4).
b. Preconstruction review and notification (§63.5).
c. Standards and Maintenance (§63.6).
d. Performance testing (§64.7).
e. Monitoring (§64.8).
f. Notification (§64.9).
g. Recordkeeping and Reporting (§64.10).
h. Control Device and Work Practices (§63.11).

19. NESHAP HH, Oil and Natural Gas Production Facilities

40CFR§63.760-§63.779 [Applicable-Exempt]

This rule does apply because the facility is a major source of HAP emissions and contains affected sources, specifically the group of all ancillary equipment, except compressors, intended to operate in volatile hazardous air pollutant service which are located at a natural gas processing plant. (§63.760(b)(1)(iii))

However, as ancillary equipment and compressors are subject to and controlled under the requirements specified in 40 CFR Part 60, Subpart OOOO, there are no applicable requirements under NESHAP Subpart HH (§63.769(b)).

This rule does not apply because there is no glycol dehydration unit, no storage vessel with the potential for flash emissions, and no compressor intended to operate in volatile hazardous air pollutant service (§63.760(b)(1)).

20. 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)).

21. NESHAP YYYY, Stationary Combustion Turbines
40CFR§63.6080-§63.6175 [Not Applicable]

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

22. NESHAP ZZZZ, Stationary Reciprocating Internal Combustion Engines (RICE)
40CFR§63.6580-§63.6675 [Applicable-Exempt]

This rule does apply to the emergency generator engine (EG-1 (6E)) because it is a "new engine"; i.e., commenced construction after 06/12/06 (§63.6590(a)(2)(iii)).

However, 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 (§63.6590(c)(1)(i)).

23. NESHAP DDDDD, Industrial, Commercial, and Institutional Boilers and Process Heaters – Major Sources
40CFR§63.7480 – §63.7575 [Applicable]

This rule does apply to the Hot Oil Heaters (1-HTR (1E) and 2-HTR (2E)) because each is each a new or reconstructed industrial, commercial, or institutional boiler and located at a major source (§63.7575 and §63.7490(a)(2)).

As each affected heater is considered a "new, large, gas 1 unit", requirements include:

a. Initial notification.
b. One-time energy assessment.
c. Work practice standards (annual tune-up).
d. Recordkeeping and reporting.

(40CFR §60.7500-§60.7560 and Table 3).

24. NESHAP JJJJJJ, Industrial, Commercial, and Institutional Boilers – Area Sources
40CFR§63.11193 – §63.11237 [Not Applicable]

This rule does not apply because all of the Heaters (1-HTR (1E) and 2-HTR (2E)) at the facility are natural gas-fired (§63.11195(e)).

25. Chemical Accident Prevention Provisions (RMP)
40CFR§68.1-§68.220 [Applicable]

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

26. Compliance Assurance Monitoring (CAM)
40CFR§64.1 §64.10 [Not Applicable]

This rule does not apply to the two (2) 454,000-gal natural gasoline storage tanks (V-2950 and V-2951 (~~5E~~3E)) because they are subject to NSPS Subpart Kb (an emission standard proposed pursuant to Section 111 of the Clean Air Act).

This rule does not apply to any other emission unit at the facility because there is no other "pollutant-specific emission unit (PSEU)" with pre-controlled emissions greater than 100 TPY (§64.2(a)).

27. Mandatory Greenhouse Gases (GHG) Reporting
40CFR§98.1-§98.9 [Applicable]

This rule does apply because the facility is a supplier that is listed in Table A-5 (Subpart NN). For suppliers, the GHGs reported are the quantity that would be emitted from combustion or use of the products supplied (§98.1(a)).

Requirements include monitoring, recordkeeping, and annual reporting of GHG from stationary fuel combustion sources (§98.2(a)(3)).

C. Applicability of Source Aggregation [Not Applicable]

The operations at the Moundsville Fractionation Plant have not been aggregated any other facility because there are no facilities that satisfy all three of the following requirements:

(1) Have the same major industry grouping (e.g. SIC 13: Oil and Gas Extraction);
(2) Are located on adjacent or contiguous properties; and
(3) Are under common control.

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]

This rule does apply to the gas-fueled heaters (1-HTR (1E) and 2-HTR (3E)) because they each burn fuel in indirect heat exchangers (45CSR-2-1).

Requirements Include:

a. Section 3 – Visible Emission Limit.
b. Section 4 – Weight Emission Standards.
c. Section 5 – Control of Fugitive Particulate Matter.
d. Section 6 – Registration.
e. Section 7 – Permits.
f. Section 8 – Testing, Monitoring, Recordkeeping, Reporting.
g. Section 9 – Startups, Shutdowns, Malfunctions.

(45CSR-2-3 thru -9)

2. Prevent and Control of Objectionable Odors
45CSR4 [Applicable]

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

3. Control of Air Pollution from Combustion of Refuse
45CSR6 [Applicable]

This rule does apply to the new process flare (FL-02 (5E) (5S)) because activities involve incineration of refuse (45CSR-6-1).

Requirements include:

a. Section 4 – Particulate Matter Emission Limit.
b. Section 5 – Registration.
c. Section 6 – Permits.
d. Section 7 –Reports and Testing.

(45CSR-6-1 thru -7)

4. Prevent and Control Air Pollution – Sulfur Oxides
45CSR10 [Applicable]

This rule does apply to the hot oil heaters (1-HTR (1E) and 2-HTR (3E)) because they are "any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer" (45CSR-10-2.8.b).

Requirements Include:

a. Section 3 – Sulfur Dioxide Weight Limits.
b. Section 5 – Combustion of Process Gas Streams.
c. Section 6 – Registration.
d. Section 7 – Permits.
e. Section 8 – Testing, Monitoring, Recordkeeping, Reporting.
f. Section 9 – Startups, Shutdowns, Malfunctions.

(45CSR-10-1 thru -9)

5. Permits (NSR) for Construction, Modification, Relocation and Operation
45CSR13 [Applicable]

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

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

The rule does not apply because the facility is neither a new major source of pollutants subject to Prevention of Significant Deterioration (PSD) rules nor is the proposed modification a modification to an existing PSD major source.

7. Standards of Performance for New Stationary Sources (40 CFR Part 60)
45CSR16 [Applicable]

This rule does apply to this source by reference of 40CFR§60 Subparts Dc, Kb, JJJJ, and OOOO. Williams is subject to the recordkeeping, monitoring, and testing required of these Subparts.

8. Permits for Construction and Modification (Nonattainment)
45CSR19 [Not Applicable]

This rule does not apply. The facility is in the Clay Tax District of Marshall County, West Virginia, which is currently classified as Attainment, Unclassified, or Maintenance for all national ambient air quality standards (NAAQS) *except SO2*. The facility's potential to emit (PTE) SO2 is far below the applicable threshold.
(https://www3.epa.gov/airquality/greenbook/wvso2_2010.html)

9. Regulation of Volatile Organic Compounds (VOC)
45CSR21 [Not Applicable]

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

10. Air Quality Management Fees Program
45CSR22 [Applicable]

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

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

This rule does not apply because equipment is used in the production and distribution of petroleum products is exempt, provided that the equipment does not produce or contact material containing more than 5% benzene by weight (§45-22-2.4).

12. Air Pollution Emissions Banking and Trading
45CSR28 [Not Applicable]

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

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

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

14. Requirements for Operating Permits (TVOP)
45CSR30 [Applicable]

This rule does apply. Williams OVM has received a 45CSR30 TVOP Permit for the subject facility.

E. Case-by-Case MACT Discussion

To satisfy case-by-case MACT requirements, WVDEP requested an analysis of the emissions control level on each emissions unit that contributes n-hexane emissions to the facility-wide PTE (with the exception of any emissions unit subject to another MACT).

This analysis demonstrates the existing level of emissions control is MACT. Emission sources at the Moundsville Fractionation Plant producing n-hexane emissions include the hot oil heaters (1-HTR (1E) and 2-HTR (2E)), process piping components (FUG (1S)) and the New Process Flare (FLR-01 (5S) (5E)).

Hot Oil Heaters (1-HTR (1E) and 2-HTR (2E))

Each hot oil heater emits n-hexane due to incomplete combustion of the natural gas fuel. The only practical or demonstrated-in-practice measure to control organic HAP emissions (e.g., n-hexane) from natural gas-fired heaters is good combustion practices. Proper operation and maintenance of the hot oil heaters will minimize the formation and emission of n-hexane by ensuring the heaters operate as designed. This includes maintaining the air/fuel ratio at the specified design point, having the proper air and fuel conditions at the burner and maintaining the fans and dampers in proper working condition. Application of other organic HAP control technologies such as afterburners or catalytic oxidizers to the hot oil heaters has not been demonstrated to be technically feasible.

NESHAP Subpart DDDDD requires an annual tune-up on each hot oil heater. The purpose of the tune-up is to ensure the burners are properly mixing the air and fuel and to reestablish the most appropriate amount of excess air throughout the operating range of the process heaters. Good combustion practices achieved through proper operation and maintenance is considered MACT for the hot oil heaters.

Process Piping Component Fugitives (FUG (1S)

The process piping fugitive emissions are already subject to MACT requirements under NSPS Subpart OOOO. MACT for process piping fugitive emissions has already been established as implementation of a leak detection and repair program. Since MACT for process piping fugitive emissions has already been established, further discussion is not warranted.

Process Flare (FLR-02 (5S) (5E))

The process flare is used to control emissions from various activities at the facility including product loading hose blowdowns, natural gasoline and hot oil expansion storage tanks, pig receiver blowdowns, railcar degassing and off-spec product flaring. These activities produce n-hexane emissions which are combusted in the flare with 99 percent control efficiency. The process flare with 99 percent control efficiency is considered MACT for control of product loading hose blowdowns, natural gasoline and hot oil expansion storage tanks, pig receiver blowdowns, railcar degassing and off-spec product flaring.

Supplement 03

Emission Calculations

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

Summaries:

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

Unit Specific:

- Process Piping Fugitive Emissions - Entire Facility (FUG (1S))
- Process Piping Fugitive Component Count - Entire Facility
- Frac1 - Hot Oil Heater - 45.54 MMBtu/hr (1-HTR (1E))
- Frac2 - Hot Oil Heaters - 89.85 MMBtu/hr (Each) (2-HTR (2E))
- New Process Flare - 620 MMBtu/hr (FL-02 (5S))
- Miscellaneous Equipment Fugitives (FUG2 (7S))
- Emergency Generator Engine Emissions – 49.2 bhp Kohler GM Vortec 3.0L (6S)
- Emergency Generator Engine - Cold-Start/Crankcase (CSC)

AP-42 and GHG Emission Factors

Criteria Pollutants - Controlled Emissions Summary

Emission Unit ID	Emission Point ID	Emission Unit Description	Site Rating	Operating Hours	Control Device	NOX lb/hr	NOX tpy	CO lb/hr	CO tpy	VOC lb/hr	VOC tpy	SO2 lb/hr	SO2 tpy	PM10/2.5 lb/hr	PM10/2.5 tpy
Moundsville Fractionation Plant - Permitted Under R13-2892G - Issued 03/13/19															
1S	na (Fug)	Fractionation Plant 1 (Fugitives Only)	12,500 bpd (ave)	8,760	LDAR	---	---	---	---	15.33	67.13	---	---	---	---
		Fractionation Plant 2 (Fugitives Only)	30,000 bpd (ave)												
		Truck Loadout (Fugitives Only)	---												
		Rail Loadout (Fugitives Only)	---												
		Condensate Unit (Fugitives Only)	6,000 bpd (ave)												
		Inlet Unit (NGL & Condensate) (Fugitives Only)	---												
2S	TLO	Truck/Rail (Loading & Unloading)	58,200 bpd (ave)	---	FL-02 (5S)	No Emissions Except Fugitives (FUG (1S)) and Blowdown/Purge Losses to Flare (FL-02 (5S))									
3S	TKS	Stabilized Condensate - Pressure Vessels (3x)	270,000 gals (total)	8,760	Pressure Vessels	No Emissions Except Fugitives (FUG (1S))									
		NGL Accumlation - Pressure Vessels (12x)	908,400 gals (total)	8,760		No Emissions Except Fugitives (FUG (1S))									
		Propane Accumulation - Pressure Vessels/Spheres (7x)	1,290,000 gals (total)	8,760		No Emissions Except Fugitives (FUG (1S))									
		Butane Accumlation - Pressure Vessels/Spheres (5x)	858,000 gals (total)	8,760		No Emissions Except Fugitives (FUG (1S))									
		Natural Gasoline Accumulation - Pressure Vessels (5x)	490,000 gals (total)	8,760		No Emissions Except Fugitives (FUG (1S))									
V-2950 (3S) V-2951 (3S)	5E	Natural Gasoline - Vertical Dome Tanks (Butane Blanket) (2x454.0k)	908,000 gals (total)	8,760	FL-02 (5S)	No Emissions Except Fugitives (FUG (1S)) and Tank Losses to Flare (FL-02 (5S))									
3S	TKS	Slop Liquids (2x) - Vertical Fixed Roof Tank	16,480 gals (total)	8,760	None	---	---	---	---	0.01	0.05	---	---	---	---
		Diesel Fuel - Horizontal Tank	520 gals	8,760		---	---	---	---	4E-03	0.02	---	---	---	---
		Gasoline - Horizontal Tank	520 gals	8,760		---	---	---	---	0.07	0.32	---	---	---	---
		Methanol (MeOH) - Horizontal Tank	300 gals	8,760		---	---	---	---	3E-03	0.01	---	---	---	---
		Mercaptan (Odorant) - Pressure Vessels (4x)	8,000 gals (total)	8,760		No Emissions Except Fugitives (FUG (1S))									
1-HTR	1E	Fractionation Plant 1 - Hot Oil Heater-1	45.54 MMBtu/hr	8,760	None	4.46	19.56	3.75	16.43	0.25	1.08	0.03	0.12	0.34	1.49
2-HTR	2E	Fractionation Plant 2 - Hot Oil Heater-2a	89.85 MMBtu/hr	8,760	None	3.23	17.03	6.65	35.00	0.36	1.89	0.05	0.28	0.67	3.52
		Fractionation Plant 2 - Hot Oil Heater-2b	89.85 MMBtu/hr	8,760		3.23		6.65		0.36		0.05		0.67	
FL-02 (5S)	5E	New Process Flare (FL-02) (99% DRE)	620 MMBtu/hr	8,760	na	85.56	42.31	170.81	84.46	280.00	140.06	0.12	0.06	1.48	0.73
7S	na (Fug)	Misc Equipment Leaks (Fugitives Only)	---	8,760	None	---	---	---	---	4.02	4.02	---	---	---	---
Moundsville Fractionation Plant - Permitted Under G60-C069 - Issued 03/31/15															
EG-1 (6S)	6E	Emergency Generator Engine (EG-1)	49.2 bhp	500	None	1.08	0.27	41.98	10.49	0.05	0.01	4E-04	9E-05	0.01	3E-03
	na (Fug)	Cold-Start/Crankase (Fugitives Only)	26 events/yr	---		---	---	---	---	5E-03	0.02	---	---	---	---
						97.58	**79.16**	**229.84**	**146.38**	**300.45**	**214.60**	**0.25**	**0.45**	**3.17**	**5.75**
							100		100		100		100		100

20% margin

Notes:
1 - The TLO (2S) thru-put includes Frac1, Frac2, and Condensate Unit, all with a
2 - Emissions estimates are based on operation at 100% of rated capacity for 8,760 hr/yr; except:
   a. The 2-HTR (2E) long-term (tpy) emissions are based on **928 MMscf/yr (Total)**
   b. The FL-02 (5S) long-term (tpy) emissions are based on **193 MMscf/yr**
   c. The FUG2 (7S) long-term (tpy) emissions are based on **2,000 hr/yr**
3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
4 - HCHO is formaldehyde; Other HAP includes, but not limited to, acetaldehyde, acrolein, and methanol (MeOH).
5 - CO2e is aggregated Greenhouse Gas (GHG), comprised of carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O), as adjusted for Global Warming Potential (GWP)
6 - PSD Major Source applicability does not count fugitives since the fractionation facility is not one of 28 named sources (Table 1 in 45 CSR 19).
7 - For Title V Major Source applicability, West Virginia 45 CSR 30 requires that natural gas processing plants, including fractionation plants, to include fugitives.

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Supplement 03 - Emission Calulations

Hazardous Air Pollutants (HAP) - Controlled Emissions Summary

Emission Unit ID	Emission Point ID	Emission Unit Description	Benzene		E-benzene		HCHO		n-Hexane		Toluene		2,2,4-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
Moundsville Fractionation Plant - Permitted Under R13-2892G - Issued 03/13/19																				
1S	na (Fug)	Fractionation Plant 1 (Fugitives Only) Fractionation Plant 2 (Fugitives Only) Truck Loadout (Fugitives Only) Rail Loadout (Fugitives Only) Condensate Unit (Fugitives Only) Inlet Unit (NGL & Condensate) (Fugitives Only)	0.02	0.08	0.01	0.03	---	---	1.08	4.72	0.07	0.29	0.04	0.17	0.13	0.57	---	---	1.34	5.85
2S	TLO	Truck/Rail (Loading & Unloading)	No Emissions Except Fugitives (FUG (1S)) and Blowdown/Purge Losses to Flare (FL-02 (5S))																	
3S	TKS	Stabilized Condensate - Pressure Vessels (3x)	No Emissions Except Fugitives (FUG (1S))																	
		NGL Accumlation - Pressure Vessels (12x)	No Emissions Except Fugitives (FUG (1S))																	
		Propane Accumulation - Pressure Vessels/Spheres (7x)	No Emissions Except Fugitives (FUG (1S))																	
		Butane Accumlation - Pressure Vessels/Spheres (5x)	No Emissions Except Fugitives (FUG (1S))																	
		Natural Gasoline Accumulation - Pressure Vessels (5x)	No Emissions Except Fugitives (FUG (1S))																	
V-2950 (3S) V-2951 (3S)	5E	Natural Gasoline - Vertical Dome Tanks (Butane Blanket) (2x454.0k)	No Emissions Except Fugitives (FUG (1S)) and Tank Losses to Flare (FL-02 (5S))																	
3S	TKS	Slop Liquids (2x) - Vertical Fixed Roof Tank	1E-04	5E-04	2E-04	9E-04	---	---	2E-04	9E-04	2E-03	0.01	---	---	1E-03	5E-03	---	---	3E-03	0.01
		Diesel Fuel - Horizontal Tank	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Gasoline - Horizontal Tank	7E-04	3E-03	1E-03	0.01	---	---	1E-03	0.01	0.01	0.05	---	---	0.01	0.03	---	---	0.02	0.10
		Methanol (MeOH) - Horizontal Tank	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3E-03	0.01	3E-03	0.01
		Mercaptan (Odorant) - Pressure Vessels (4x)	No Emissions Except Fugitives (FUG (1S))																	
1-HTR	1E	Fractionation Plant 1 - Hot Oil Heater-1	9E-05	4E-04	---	---	3E-03	0.01	0.08	0.35	2E-04	7E-04	---	---	---	---	8E-05	4E-04	0.08	0.37
2-HTR	2E	Fractionation Plant 2 - Hot Oil Heater-2a	2E-04	1E-03	---	---	0.01	0.03	0.16	0.83	3E-04	2E-03	---	---	---	---	7E-04	4E-03	0.17	0.88
		Fractionation Plant 2 - Hot Oil Heater-2b	2E-04		---		0.01		0.16		3E-04		---		---		7E-04		0.17	
FL-02 (5S)	5E	New Process Flare (FL-02) (99% DRE)	0.19	0.10	0.09	0.05	0.05	0.02	11.23	5.83	0.52	0.27	0.39	0.20	1.86	0.96	7E-04	4E-04	14.32	7.43
7S	na (Fug)	Misc Equipment Leaks (Fugitives Only)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Moundsville Fractionation Plant - Permitted Under G60-C069 - Issued 03/31/15																				
EG-1 (6S)	6E	Emergency Generator Engine (EG-1)	1E-03	2E-04	2E-05	4E-06	0.01	3E-03	---	---	4E-04	9E-05	---	---	1E-04	3E-05	0.01	1E-03	0.02	0.01
		Cold-Start/Crankase	4E-05	2E-04	4E-05	2E-04	4E-04	2E-03	4E-05	2E-04	4E-05	2E-04	4E-05	2E-04	4E-05	2E-04	---	---	6E-04	3E-03
			0.21	**0.18**	**0.10**	**0.09**	**0.08**	**0.08**	**12.71**	**11.74**	**0.60**	**0.61**	**0.43**	**0.37**	**1.99**	**1.57**	**0.01**	**0.02**	**16.12**	**14.66**
				10		10		10		10		10		10		10		10		25

Notes:
1 - The TLO (2S) thru-put includes Frac1, Frac2, and 6,000 bbl/day Stabilized Condensat **20% margin**
2 - Emissions estimates are based on operation at 100% of rated capacity for 8,760 hr/yr; except:
  a. The 2-HTR (2E) long-term (tpy) emissions are based on **927.53 MMscf/yr (Total)**
  b. The FL-02 (5S) long-term (tpy) emissions are based on **192.66 MMscf/yr**
  c. The FUG2 (7S) long-term (tpy) emissions are based on **2,000 hr/yr**
3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
4 - HCHO is formaldehyde; Other HAP includes, but not limited to, acetaldehyde, acrolein, and methanol (MeOH).
5 - CO2e is aggregated Greenhouse Gas (GHG), comprised of carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O), as adjusted for Global Warming Potential (GWP)
6 - PSD Major Source applicability does not count fugitives since the fractionation facility is not one of 28 named sources (Table 1 in 45 CSR 19).
7 - For Title V Major Source applicability, West Virginia 45 CSR 30 requires that natural gas processing plants, including fractionation plants, to include fugitives.

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Supplement 03 - Emission Calulations

Greenhouse Gas (GHG) - Emissions Summary

Emission Unit ID	Emission Point ID	Emission Unit Description	Site Rating	Operating Hours	Heat Input (HHV)	CO2 GWP: 1	CO2e	CH4 GWP: 25	CO2e	N2O GWP: 298	CO2e	TOTAL CO2e	
				hr/yr	MMBtu/hr	tpy	tpy	tpy	tpy	tpy	tpy	lb/hr	tpy
Moundsville Fractionation Plant - Permitted Under R13-2892G - Issued 03/13/19													
1S	na (Fug)	Fractionation Plant 1 (Fugitives Only)	12,500 bpd (ave)	8,760	---	---	---	3.36	83.91	---	---	3.36	83.91
		Fractionation Plant 2 (Fugitives Only)	30,000 bpd (ave)										
		Truck Loadout (Fugitives Only)	---										
		Rail Loadout (Fugitives Only)	---										
		Condensate Unit (Fugitives Only)	6,000										
		Inlet Unit (NGL & Condensate) (Fugitives Only)	---										
2S	TLO	Truck/Rail (Loading & Unloading)	58,200 bpd (ave)	8,760	No Emissions Except Fugitives (FUG (1S)) and Blowdown/Purge Losses to Flare (FL-02 (5S))								
3S	TKS	Stabilized Condensate - Pressure Vessels (3x)	270,000 gals (total)	8,760	No Emissions Except Fugitives (FUG (1S))								
		NGL Accumlation - Pressure Vessels (12x)	908,400 gals (total)	8,760	No Emissions Except Fugitives (FUG (1S))								
		Propane Accumulation - Pressure Vessels/Spheres (7x)	1,290,000 gals (total)	8,760	No Emissions Except Fugitives (FUG (1S))								
		Butane Accumlation - Pressure Vessels/Spheres (5x)	858,000 gals (total)	8,760	No Emissions Except Fugitives (FUG (1S))								
		Natural Gasoline Accumulation - Pressure Vessels (5x)	490,000 gals (total)	8,760	No Emissions Except Fugitives (FUG (1S))								
V-2950 (3S) V-2951 (3S)	5E	Natural Gasoline - Vertical Dome Tanks (Butane Blanket) (2x454.0k)	908,000 gals (total)	8,760	No Emissions Except Fugitives (FUG (1S)) and Tank Losses to Flare (FL-02 (5S))								
3S	TKS	Slop Liquids (2x) - Vertical Fixed Roof Tank	16,480 gals (total)	8,760	---	---	---	---	---	---	---	---	---
		Diesel Fuel - Horizontal Tank	520 gals	8,760	---	---	---	---	---	---	---	---	---
		Gasoline - Horizontal Tank	520 gals	8,760	---	---	---	---	---	---	---	---	---
		Methanol (MeOH) - Horizontal Tank	300 gals	8,760	---	---	---	---	---	---	---	---	---
		Mercaptan (Odorant) - Pressure Vessels (4x)	8,000 gals (total)	8,760	No Emissions Except Fugitives (FUG (1S))								
1-HTR	1E	Fractionation Plant 1 - Hot Oil Heater-1	45.54 MMBtu/hr	8,760	45.54	23,333	23,333	0.44	10.99	0.04	13.10	5,333	23,357
2-HTR	2E	Fractionation Plant 2 - Hot Oil Heater-2a	89.85 MMBtu/hr	8,760	108.00	55,173	55,173	1.04	26.07	0.10	31.08	20,981	55,231
		Fractionation Plant 2 - Hot Oil Heater-2b	89.85 MMBtu/hr										
FL-02 (5S)	5E	New Process Flare (FL-02) (99% DRE)	620.00 MMBtu/hr	8,760	69.99	35,861	35,861	4.33	108.37	0.08	22.38	8,217	35,992
7S	na (Fug)	Misc Equipment Leaks (Fugitives Only)	---	8,760	---	---	---	---	---	---	---	---	---
Moundsville Fractionation Plant - Permitted Under G60-C069 - Issued 03/31/15													
EG-1 (6S)	6E	Emergency Generator Engine (EG-1)	49.20 bhp	500	0.42	18.36	18.36	0.04	0.90	3E-05	0.01	77.08	19.27
	na (Fug)	Cold-Start/Crankase (Fugitives Only)	26 events/yr	---	---	9.24	9.24	0.40	---	---	---	4.41	19.31
		TOTAL PTE (w/ Fugitives):				**114,395**		**9.61**		**0.22**			**114,702**
		TVOP Threshold:				na		na		na			na

20.0% margin

1 - The TLO (2S) thru-put includes Frac1, Frac2, and Condensate Unit, all with a

2 - Emissions estimates are based on operation at 100% of rated capacity for 8,760 hr/yr; except:

a. The 2-HTR (2E) long-term (tpy) emissions are based on **927.53 MMscf/yr (Total)**
b. The FL-02 (5S) long-term (tpy) emissions are based on **192.66 MMscf/yr**
c. The FUG2 (7S) long-term (tpy) emissions are based on **2,000 hr/yr**

3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5

4 - HCHO is formaldehyde; Other HAP includes, but not limited to, acetaldehyde, acrolein, and methanol (MeOH).

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

6 - PSD Major Source applicability does not count fugitives since the fractionation facility is not one of 28 named sources (Table 1 in 45 CSR 19).

7 - For Title V Major Source applicability, West Virginia 45 CSR 30 requires that natural gas processing plants, including fractionation plants, to include fugitives.

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Supplement 03 - Emission Calulations

Pre-Controlled Emissions Summary

Emission Unit ID	Emission Point ID	Emission Unit Description	Site Rating	NOX		CO		VOC		n-Hexane		Total HAP		CO2e	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Moundsville Fractionation Plant - Permitted Under R13-2892G - Issued 03/13/19															
1S	na (Fug)	Fractionation Plant 1 (Fugitives Only)	12,500 bpd (ave)	---	---	---	---	83.17	364.27	5.84	25.59	7.25	31.75	103.96	455.34
		Fractionation Plant 2 (Fugitives Only)	30,000 bpd (ave)												
		Truck Loadout (Fugitives Only)	---												
		Rail Loadout (Fugitives Only)	---												
		Condensate Unit (Fugitives Only)	6,000												
		Inlet Unit (NGL & Condensate) (Fugitives Only)	---												
2S	TLO	Truck/Rail (Loading & Unloading)	58,200 bpd (ave)	No Emissions Except Fugitives (FUG (1S)) and Blowdown/Purge Losses to Flare (FL-02 (5S))											
3S	TKS	Stabilized Condensate - Pressure Vessels (3x)	270,000 gals (total)	No Emissions Except Fugitives (FUG (1S))											
		NGL Accumlation - Pressure Vessels (12x)	908,400 gals (total)	No Emissions Except Fugitives (FUG (1S))											
		Propane Accumulation - Pressure Vessels/Spheres (7x)	1,290,000 gals (total)	No Emissions Except Fugitives (FUG (1S))											
		Butane Accumlation - Pressure Vessels/Spheres (5x)	858,000 gals (total)	No Emissions Except Fugitives (FUG (1S))											
		Natural Gasoline Accumulation - Pressure Vessels (5x)	490,000 gals (total)	No Emissions Except Fugitives (FUG (1S))											
V-2950 (3S) V-2951 (3S)	5E	Natural Gasoline - Vertical Dome Tanks (Butane Blanket) (2x454.0k)	908,000 gals (total)	No Emissions Except Fugitives (FUG (1S)) and Tank Losses to Flare (FL-02 (5S))											
3S	TKS	Slop Liquids (2x) - Vertical Fixed Roof Tank	16,480 gals (total)	---	---	---	---	0.01	0.05	2E-04	9E-04	3E-03	0.01	---	---
		Diesel Fuel - Horizontal Tank	520 gals	---	---	---	---	4E-03	0.02	---	---	---	---	---	---
		Gasoline - Horizontal Tank	520 gals	---	---	---	---	0.07	0.32	1E-03	0.01	0.02	0.10	---	---
		Methanol (MeOH) - Horizontal Tank	300 gals	---	---	---	---	3E-03	0.01	---	---	3E-03	0.01	---	---
		Mercaptan (Odorant) - Pressure Vessels (4x)	8,000 gals (total)	No Emissions Except Fugitives (FUG (1S))											
1-HTR	1E	Fractionation Plant 1 - Hot Oil Heater-1	45.54 MMBtu/hr	4.46	19.56	3.75	16.43	0.25	1.08	0.03	0.12	0.08	0.37	5,333	23,357
2-HTR	2E	Fractionation Plant 2 - Hot Oil Heater-2a	89.85 MMBtu/hr	3.23	28.34	6.65	58.24	0.36	3.15	0.16	1.39	0.17	1.46	10,491	91,898
		Fractionation Plant 2 - Hot Oil Heater-2b	89.85 MMBtu/hr	3.23		6.65		0.36		0.16		0.17		10,491	
FL-02 (5S)	5E	New Process Flare (FL-02) (99% DRE)	620.00 MMBtu/hr	---	---	---	---	28,000	14,006	1,123	582.79	1,427	740.77	20,883	10,837
7S	na (Fug)	Misc Equipment Leaks (Fugitives Only)	---	---	---	---	---	4.02	4.02	---	---	---	---	---	---
Moundsville Fractionation Plant - Permitted Under G60-C069 - Issued 03/31/15															
EG-1 (6S)	6E	Emergency Generator Engine (EG-1)	49.20 bhp	1.08	0.27	41.98	10.49	0.05	0.01	---	---	0.02	0.01	77.08	19.27
	na (Fug)	Cold-Start/Crankase (Fugitives Only)	26 events/yr	---	---	---	---	5E-03	0.02	4E-05	2E-04	6E-04	3E-03	4.41	19.31
TOTAL PTE:				**12.02**	**48.16**	**59.03**	**85.17**	**28,005**	**14,015**	**1,123**	**584.30**	**1,428**	**742.72**	**47,278**	**126,130**

Notes:
1 - The TLO (2S) thru-put includes Frac1, Frac2, and Condensate Unit, all with a **20.0% margin**
2 - Emissions estimates are based on operation at 100% of rated capacity for 8,760 hr/yr; except:
  a. The 2-HTR (2E) long-term (tpy) emissions are based on **927.53 MMscf/yr (Total)**
  b. The FL-02 (5S) long-term (tpy) emissions are based on **192.66 MMscf/yr**
  c. The FUG2 (7S) long-term (tpy) emissions are based on **2,000 hr/yr**
3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
4 - HCHO is formaldehyde; Other HAP includes, but not limited to, acetaldehyde, acrolein, and methanol (MeOH).
5 - CO2e is aggregated Greenhouse Gas (GHG), comprised of carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O), as adjusted for Global Warming
6 - PSD Major Source applicability does not count fugitives since the fractionation facility is not one of 28 named sources (Table 1 in 45 CSR 19).
7 - For Title V Major Source applicability, West Virginia 45 CSR 30 requires that natural gas processing plants, including fractionation plants, to include fugitives.

The Pre-Control Natural Gasoline Tank Emissions are estimated as follows:

	4,320	Total Flow scf/hr (ave)
x	160,617	lb VOC/MMscf
x	2,119	lb n-Hexane /MMscf
x	2,625	lb total HAP/MMscf
=	693.86	lb VOC/hr Pre-Controlled
=	9.15	lb n-Hexane/hr Pre-Controlled
=	11.34	lb total HAP/hr Pre-Controlled
=	3,039	ton VOC/yr Pre-Controlled
=	40.09	ton n-Hexane/yr Pre-Controlled
=	49.67	ton total HAP/yr Pre-Controlled

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Moundsville Fractionation Plant

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Supplement 03 - Emission Calulations

Process Piping Fugitive Emissions - Entire Facility

NEW DATA				
Description (Service)	**Light Liquid**	**Gas / Vapor***	**Both (Max)**	**Total**
Compressor Seals				
Component Count	---	1	---	1
Emission Factor (lb/unit/hr)	---	0.02	---	---
LDAR Control Credit	---	---	---	---
VOC Emissions (lb/hr)	---	0.02	---	0.02
VOC Emissions (TPY)	---	0.08	---	0.08
Connectors				
Component Count	16,495	2,389	1,538	20,422
Emission Factor (lb/unit/hr)	5E-04	4E-04	5E-04	---
LDAR Control Credit	93%	93%	93%	---
VOC Emissions (lb/hr)	0.53	0.07	0.05	0.66
VOC Emissions (TPY)	2.34	0.32	0.22	2.88
Flanges				
Component Count	3,196	1,708	873	5,777
Emission Factor (lb/unit/hr)	2E-04	9E-04	9E-04	---
LDAR Control Credit	---	---	---	---
VOC Emissions (lb/hr)	0.77	1.47	0.75	2.99
VOC Emissions (TPY)	3.39	6.43	3.29	13.12
Pressure Relief Devices				
Component Count	101	139	---	240
Emission Factor (lb/unit/hr)	0.02	0.02	---	---
LDAR Control Credit	---	---	---	---
VOC Emissions (lb/hr)	1.67	2.69	---	4.36
VOC Emissions (TPY)	7.33	11.78	---	19.11
Pump Seals				
Component Count	47	---	---	47
Emission Factor (lb/unit/hr)	0.03	---	---	---
LDAR Control Credit	75%	---	---	---
VOC Emissions (lb/hr)	0.34	---	---	0.34
VOC Emissions (TPY)	1.48	---	---	1.48
Valves				
Component Count	4,234	2,146	2,057	8,437
Emission Factor (lb/unit/hr)	0.01	0.01	0.01	---
LDAR Control Credit	88%	92%	88%	---
VOC Emissions (lb/hr)	2.80	1.70	2.45	6.95
VOC Emissions (TPY)	12.27	7.46	10.73	30.45
Grand Total VOC				
Component Count	24,072	6,383	4,468	**34,924**
VOC Emissions (lb/hr)	6.12	5.95	3.25	15.33
VOC Emissions (TPY)	**26.81**	**26.08**	**14.23**	**67.13**

Speciated HAP	Average Wgt%	lb/hr	tpy
Benzene	0.12%	0.02	0.08
Ethylbenzene	0.05%	0.01	0.03
n-Hexane	7.03%	1.08	4.72
Toluene	0.43%	0.07	0.29
2,2,4-TMP	0.25%	0.04	0.17
Xylenes	0.84%	0.13	0.57
Total HAP	8.72%	1.34	5.85
GHG	**Average Wgt%**	**lb/hr**	**tpy**
Methane (GWP=25)	5.00%	0.77	3.36
CO2e	---	19.16	83.91

EPA Protocol for Equipment Leak Emission Estimates
(http://www.epa.gov/ttnchie1/efdocs/equiplks.pdf)

Table 2-4.
Oil and Gas Production Operations
Average Emission Factors

These factors are for total organic compound emission rates (including non-VOCs such as methane and ethane) and apply to gas plants and gas production.

Equipment Type	Service	Emission Factor	
		kg/hr/unit	lb/hr/unit
Valves	Gas	0.00450	0.00992
	Light Oil	0.00250	0.00551
Pump Seals	Gas	na	na
	Light Oil	0.01300	0.02866
Compressor Seals	Gas	0.00880	0.01940
	Light Oil	na	na
Pressure Relief Valves	Gas	0.00880	0.01940
	Light Oil	0.00750	0.01653
Connectors	Gas	0.00020	0.00044
	Light Oil	0.00021	0.00046
Flanges	Gas	0.00039	0.00086
	Light Oil	0.00011	0.00024
Open-Ended Lines	Gas	0.00200	0.00441
	Light Oil	0.00140	0.00309
Sampling Connections	Gas	0.00880	0.01940
	Light Oil	0.00750	0.01653
All Other	Gas	0.00880	0.01940
	Light Oil	0.00750	0.01653

Table 4.1 – Control effectiveness for an LDAR program at a chemical process unit and a refinery.

Equipment Type and Service	Control Effectiveness (% Reduction) Monthly Monitoring 10,000 ppmv Leak Definition	Quarterly Monitoring 10,000 ppmv Leak Definition	500 ppm Leak Definition[3]
Chemical Process Unit			
Valves – Gas Service[2]	87	67	92
Valves – Light Liquid Service[3]	84	61	88
Pumps – Light Liquid Service[3]	69	45	75
Connectors – All Services			93
Refinery			
Valves – Gas Service[2]	88	70	96
Valves – Light Liquid Service[3]	76	61	96
Pumps – Light Liquid Service[3]	68	45	88
Connectors – All Services			81

Source: Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, Nov 1995

[1] Control effectiveness attributable to the HON negotiated equipment leak regulation (40 CFR 63, Subpart H) is estimated based on equipment specific leak definitions and performance levels. However, pumps subject to the HON at existing process units have a 1,000 to 5,000 ppm leak definition, depending on the type of process.

[2] Gas (vapor) service means the material in contact with the equipment component is in a gaseous state at the process operating conditions.

[3] Light liquid service means the material in contact with the equipment component is in a liquid state in which the sum of the concentration of individual constituents with a vapor pressure above 0.3 kilopascals (kPa) at 20°C is greater than or equal to 20% by weight.

All component counts include a 10% Safety Factor.

Process Piping Fugitive Component Count - Entire Facility

Component Summary Report

Williams - Moundsville

Component Type:	Service:				Leaking - Placed On DoR:	On Removal:	Unsafe:	Inacc-essible:	DTM:	NDE:	CVS:	Total:
	Heavy Liquid:	Light Liquid:	Gas / Vapor:	Both:								
COMPRESSOR	0	0	1	0	0	0	0	0	0	0	0	1
CONNECTOR	0	17900	3725	2192	33	0	0	0	84	0	248	23817
PRESSURE RELIEF DEVICE	0	92	126	0	0	0	0	0	0	0	139	218
PUMP	0	43	0	0	0	1	0	0	0	0	0	43
VALVE	0	3849	1951	1870	5	0	0	0	62	0	406	7670
Totals:	**0**	**21884**	**5803**	**4062**	**38**	**1**	**0**	**0**	**146**	**0**	**793**	**31749**

Component Summary Report

Williams - Moundsville

Component Type:	Service:				Leaking - Placed On DoR:	On Removal:	Unsafe:	Inacc-essible:	DTM:	NDE:	CVS:	Total:
	Heavy Liquid:	Light Liquid:	Gas / Vapor:	Both:								
COMPRESSOR	0	0	0	0	0	0	0	0	0	0	0	0
CONNECTOR	0	2905	1553	794	16	0	0	0	47	0	110	5252
PRESSURE RELIEF DEVICE	0	0	0	0	0	0	0	0	0	0	0	0
PUMP	0	0	0	0	0	0	0	0	0	0	0	0
VALVE	0	0	0	0	0	0	0	0	0	0	0	0
Totals:	**0**	**2905**	**1553**	**794**	**16**	**0**	**0**	**0**	**47**	**0**	**110**	**5252**

Williams Ohio Valley Midstream LLC

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Supplement 03 - Emission Calulations

Frac1 - Hot Oil Heater - 45.54 MMBtu/hr (1-HTR (1E))

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
1-HTR (1E)	Frac1 - Hot Oil Heater 45.54 MMBtu/hr (HHV) 8,760 hr/yr 44,647 scf/hr 391.11 MMscf/yr 918 Btu/scf (LHV) 1,020 Btu/scf (HHV)	EPA AP-42 Table 1.4-1	NOX	100	0.10	4.46	19.56	na	4.46	19.56
		EPA AP-42 Table 1.4-1	CO	84	0.08	3.75	16.43	na	3.75	16.43
		EPA AP-42 Table 1.4-2	VOC	5.50	0.01	0.25	1.08	na	0.25	1.08
		EPA AP-42 Table 1.4-2	SO2	0.60	6E-04	0.03	0.12	na	0.03	0.12
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	0.01	0.34	1.49	na	0.34	1.49
		EPA AP-42 Table 1.4-3	Benzene	2E-03	2E-06	9E-05	4E-04	na	9E-05	4E-04
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	HCHO	0.08	7E-05	3E-03	0.01	na	3E-03	0.01
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	2E-03	0.08	0.35	na	0.08	0.35
		EPA AP-42 Table 1.4-3	Toluene	3E-03	3E-06	2E-04	7E-04	na	2E-04	7E-04
		EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	Xylenes	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3/4	Other HAP	2E-03	2E-06	8E-05	4E-04	na	8E-05	4E-04
		SUM	Total HAP	1.88	2E-03	0.08	0.37	na	0.08	0.37
		40CFR§98 - Table C-1	CO2	119,317	116.98	5,327	23,333	na	5,327	23,333
		40CFR§98 - Table C-2	CH4	2.25	2E-03	0.10	0.44	na	0.10	0.44
		40CFR§98 - Table C-2	N2O	0.22	2E-04	0.01	0.04	na	0.01	0.04
		40CFR§98 - Table A-1	CO2e	119,440	117.10	5,333	23,357	---	5,333	23,357

Notes: 1 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.

2 - The fuel heating value will vary, 920 Btu/scf (LHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 03 - Emission Calulations

Frac2 - Hot Oil Heaters - 89.85 MMBtu/hr (Each) (2-HTR (2E))

Unit ID (Point ID)	Description	Reference	Pollutant	Emission Factor		Pre-Controlled Emissions		Control Efficiency	Controlled Emissions	
				lb/MMscf	lb/MMBtu	lb/hr (Each)	tpy (Both)	%	lb/hr (Each)	tpy (Both)
2-HTR (2E) (Qty: 2)	**Frac2 - Hot Oil Heater-2a** **Frac2 - Hot Oil Heater-2b** 89.85 MMBtu/hr (Max - Each) 54.00 MMBtu/hr (Ave - Each) **108.00 MMBtu/hr (Ave - Total)** **8,760 hr/yr** 88,088 scf/hr (Each) 927.53 MMscf/yr (Total) 920 Btu/scf (LHV) 1,020 Btu/scf (HHV)	Vendor Data	NOX	36.72	0.036	3.23	28.34	na	**3.23**	17.03
		Vendor Data	CO	75.48	0.074	6.65	58.24	na	**6.65**	35.00
		Vendor Data	VOC	4.08	0.004	0.36	3.15	na	**0.36**	1.89
		EPA AP-42 Table 1.4-2	SO2	0.60	0.001	0.05	0.46	na	**0.05**	0.28
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	0.007	0.67	5.86	na	**0.67**	3.52
		EPA AP-42 Table 1.4-3	Benzene	2E-03	2E-06	2E-04	2E-03	na	**2E-04**	1E-03
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	HCHO	0.08	7E-05	7E-03	0.06	na	**7E-03**	0.03
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	2E-03	0.16	1.39	na	**0.16**	0.83
		EPA AP-42 Table 1.4-3	Toluene	3E-03	3E-06	3E-04	3E-03	na	**3E-04**	2E-03
		EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3	Xylenes	---	---	---	---	---	---	---
		EPA AP-42 Table 1.4-3/4	Other HAP	8E-03	7E-06	7E-04	6E-03	na	**7E-04**	4E-03
		SUM	Total HAP	1.89	2E-03	0.17	1.46	na	**0.17**	0.88
		40CFR§98 - Table C-1	CO2	118,969	116.64	10,480	91,803	na	**10,480**	55,173
		40CFR§98 - Table C-2	CH4	2.25	2E-03	0.20	1.74	na	**0.20**	1.04
		40CFR§98 - Table C-2	N2O	0.22	2E-04	0.02	0.17	na	**0.02**	0.10
		40CFR§98 - Table A-1	CO2e	119,092	116.76	10,491	91,898	---	**10,491**	55,231

Notes:
1 - The pre-controlled emissions are based-on operating at capacity for 8,760 hr/yr.
2 - The long term (tpy) controlled emissions are based on each heater operating an average of: 60% capacity
3 - The short-term (lb/hr) emissions are the sum of both heaters operating simultaneously at 100% capacity.
4 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.

New Process Flare - 620 MMBtu/hr (FL-02 (5S))

Unit ID (Point ID)	Description	Reference	Pollutant	Emission Factor lb/MMscf	Emission Factor lb/MMBtu	Pre-Controlled Emissions lb/hr	Pre-Controlled Emissions tpy	Control Efficiency %	Controlled Emissions lb/hr	Controlled Emissions tpy
New Process Flare FL-02 (5S) 620 MMBtu/hr Capacity	**8,760 hr/yr (Total)**	TCEQ	NOX	439.19	0.14	---	---	---	**85.56**	**42.31**
	28,000 lb/hr (Max)	TCEQ	CO	876.78	0.28	---	---	---	**170.81**	**84.46**
	192.66 MMscf/yr (Total)	Mass Balance	VOC	na - Mass Balance		28,000	14,006	99.0%	**280.00**	**140.06**
	3,183 Btu/scf (ave)	EPA AP-42 Table 1.4-2	SO2	0.60	1.9E-04	---	---	---	**0.12**	**0.06**
	69.99 MMBtu/hr (ave)	EPA AP-42 Table 1.4-2	PM10/2.5	7.60	2.4E-03	---	---	---	**1.48**	**0.73**
	613,133 MMBtu/yr (Total)	Mass Balance	Benzene	na - Mass Balance		18.56	9.63	99.0%	**0.19**	**0.10**
	8,760 hr/yr (Continuous)	Mass Balance	Ethylbenzene	na - Mass Balance		9.28	4.82	99.0%	**0.09**	**0.05**
	21,884 scf/hr (Continuous)	EPA AP-42 Table 1.4-3	HCHO	0.23	7.35E-05	---	---	---	**0.05**	**0.02**
	191.71 MMscf/yr (Continuous)	Mass Balance	n-Hexane	na - Mass Balance		1,123	582.79	99.0%	**11.23**	**5.83**
	3,182 Btu/scf (Continuous)	Mass Balance	Toluene	na - Mass Balance		51.98	26.97	99.0%	**0.52**	**0.27**
	69.63 MMBtu/hr (Continuous)	EPA AP-42 Table 1.4-3	2,2,4-TMP	na - Mass Balance		38.98	20.23	99.0%	**0.39**	**0.20**
	609,983 MMBtu/yr (Continuous)	Mass Balance	Xylenes	na - Mass Balance		185.63	96.33	99.0%	**1.86**	**0.96**
	24 hr/yr (Maintenance)	EPA AP-42 Table 1.4-3	Other HAP	3.7E-03	1.18E-06	8E-05	4E-04	---	**7E-04**	**4E-04**
	39,667 scf/hr (Maintenance)	Mass Balance	Total HAP	Sum		1,427	740.77	99.0%	**14.32**	**7.43**
	0.95 MMscf/yr (Maintenance)	EPA GHG Emission Factors	CO2	372,208	116.98	---	---	---	**72,526**	**35,861**
	3,308 Btu/scf (Maintenance)	Mass Balance	CH4	na - Mass Balance		835.31	433.48	99.0%	**8.35**	**4.33**
	131.23 MMBtu/hr (Maintenance)	EPA GHG Emission Factors	N2O	0.70	2.2E-04	---	---	---	**0.14**	**0.08**
	3,149 MMBtu/yr (Maintenance)	40CFR§98 - Table A-1	CO2e	---	---	20,883	10,837	---	**72,775**	**35,992**

Notes: 1 - Smokeless Design Capacity = 28,000 lb/hr | 21,098 Btu/lb (HHV) | 591 MMBtu/hr | 5% Margin | **620.00 MMBtu/hr (HHV)** | 150,841 lb/MMscf

2 - The Total Waste Gas to Flare is estimated as follows:

Description		Heat Value (HHV)	Hourly Flow Rate (ave)	Hourly Heat Input (HHV)	Annual Flow Rate	Annual Heat Input (HHV)
Stabilized Condensate Hose Blowdown		4,652 Btu/scf	600 scf/hr (ave)	2.79 MMBtu/hr (ave)	5.26 MMscf/yr	24,452 MMBtu/yr
Product Loading/Hose Blowdown		3,477 Btu/scf	5,735 scf/hr (ave)	19.94 MMBtu/hr (ave)	50.23 MMscf/yr	174,661 MMBtu/yr
Natural Gasoline Tanks w/Butane Blanket		3,401 Btu/scf	4,320 scf/hr (ave)	14.69 MMBtu/hr (ave)	37.84 MMscf/yr	128,719 MMBtu/yr
NGL Pig Receiver Blowdowns (250 Events/year)		3,308 Btu/scf	250 scf/hr (ave)	0.827 MMBtu/hr (ave)	2.19 MMscf/yr	7,245 MMBtu/yr
Hot Oil Expansion Tanks (Fuel/Purge Gas)		1,046 Btu/scf	231 scf/hr (ave)	0.24 MMBtu/hr (ave)	2.02 MMscf/yr	2,117 MMBtu/yr
Rail Car Degassing (50% C3/C4 + 50% NGL)		3,771 Btu/scf	1,142 scf/hr (ave)	4.30 MMBtu/hr (ave)	10.00 MMscf/yr	37,708 MMBtu/yr
Off-Spec Product Flaring (Inlet NGL)		3,308 Btu/scf	7,420 scf/hr (ave)	24.55 MMBtu/hr (ave)	65.00 MMscf/yr	215,039 MMBtu/yr
Continuous Flare Purge (Fuel/Purge Gas)		1,046 Btu/scf	1,962 scf/hr (ave)	2.05 MMBtu/hr (ave)	17.19 MMscf/yr	17,981 MMBtu/yr
Continuous Flare Pilot (Fuel/Purge Gas)		1,046 Btu/scf	225 scf/hr (ave)	0.24 MMBtu/hr (ave)	1.97 MMscf/yr	2,062 MMBtu/yr
Total Continuous Flow		3,182 Btu/scf	21,884 scf/hr (ave)	69.63 MMBtu/hr (ave)	191.71 MMscf/yr	609,983 MMBtu/yr
Maintenance Blowdown	24 hr/yr	3,308 Btu/scf	39,667 scf/hr (max)	131.23 MMBtu/hr (max)	0.95 MMscf/yr	3,149 MMBtu/yr
Grand Total Flow to Flare		**3,183 Btu/scf**	**21,993 scf/hr (ave)** **3,317 lb/hr (ave)**	**69.99 MMBtu/hr (ave)**	**192.66 MMscf/yr**	**613,133 MMBtu/yr**

3 - The Pre-Controlled Waste Gas composition is estimated as follows (see Supplement 05 - Waste Gas (aka; Waste Gas) Summary:

			Max Instantaneous Flow Rate		Annual Average Flow Rate	
CO2	-- Weight %	--- lb/MMscf		--- lb/hr CO2		--- tpy CO2
Methane	2.98 Weight %	4,500 lb/MMscf		835.31 lb/hr Methane		433.48 tpy Methane
Ethane	0.73 Weight %	1,100 lb/MMscf		204.19 lb/hr Ethane		105.96 tpy Ethane
VOC	100.00 Weight %	145,400 lb/MMscf		28,000 lb/hr VOC		14,006 tpy VOC
Benzene	0.07 Weight %	100 lb/MMscf		18.56 lb/hr Benzene		9.63 tpy Benzene
E-Benzene	0.03 Weight %	50 lb/MMscf		9.28 lb/hr E-Benzene		4.82 tpy E-Benzene
n-Hexane	4.01 Weight %	6,050 lb/MMscf	**28,000 lb/hr (max)**	1,123 lb/hr n-Hexane	**192.66 MMscf/yr**	582.79 tpy n-Hexane
Toluene	0.19 Weight %	280 lb/MMscf		51.98 lb/hr Toluene		26.97 tpy Toluene
2,2,4-TMP	0.14 Weight %	210 lb/MMscf		38.98 lb/hr 2,2,4-TMP		20.23 tpy 2,2,4-TMP
Xylenes	0.66 Weight %	1,000 lb/MMscf		185.63 lb/hr Xylenes		96.33 tpy Xylenes
Total HAP	5.10 Weight %	7,690 lb/MMscf		1,427.46 lb/hr Total HAP		740.77 tpy Total HAP

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 03 - Emission Calulations

Miscellaneous Equipment Fugitives (FUG2 (7S))

Unit Description	Unit No.	Cumulative Total Fugitive Leak Rate			VOC (Propane) 116,500 lb/MMscf		n-Hexane --- lb/MMscf		BTEX, TMP (ea) --- lb/MMscf		Total HAP --- lb/MMscf		CH4 --- lb/MMscf		CO2e GWP: 25 lb/MMscf	
		scf/hr	hr/yr	MMscf/yr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Miscellaneous Equipment	FUG2	34.50	2,000	0.07	4.02	4.02	---	---	---	---	---	---	---	---	---	---

Notes: 1 - Fugitive leaks from miscellaneous equipment is a broad category covering leaks from sealed surfaces, such as packing and gaskets, resulting from the wear of mechanical joints, seals, and rotating surfaces over time.

2 - Emissions include a 20 bhp electric driven compressor used to off-load propane gas from rail cars.

Emergency Generator Engine Emissions – 49.2 bhp Kohler GM Vortec 3.0L (EG-1 (6S) (6E))

Unit ID	Description	Reference	Pollutant	Pre-Controlled Emissions			Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
EG-1 (6S)	**Emergency Generator Engine 01** **Kohler** **GM Vortec 3.0L** **49.2 bhp** 1,800 rpm, 4 cyl 45 in3/cyl 4SRB / AFRC EPA Certified 2013 Model Year NSPS JJJJ Affected **500 hr/yr** 7,660 Btu/bhp-hr (LHV) 8,511 Btu/bhp-hr (HHV) 0.38 MMBtu/hr (LHV) 0.42 MMBtu/hr (HHV) 166 scf/hr 0.08 MMscf/yr 2,264 Btu/scf (LHV) 2,516 Btu/scf (HHV) (Propane)	NSPS JJJJ	NOX	10	1.08	0.27	---	10	1.08	0.27
		NSPS JJJJ	CO	387	41.98	10.49	---	387	41.98	10.49
		AP-42 Table 3.2-3	THC (TOC)	2.07	0.22	0.06	---	2.07	0.22	0.06
		AP-42 Table 3.2-3	NMHC	0.74	0.08	0.02	---	0.74	0.08	0.02
		AP-42 Table 3.2-3	NMNEHC	0.33	0.04	0.01	---	0.33	0.04	0.01
		AP-42 Table 3.2-3	VOC	0.45	0.05	0.01	---	0.45	0.05	0.01
		AP-42 Table 3.2-3	SO2	3E-03	4E-04	9E-05	---	3E-03	4E-04	9E-05
		AP-42 Table 3.2-3	PM10/2.5	0.11	0.01	3E-03	---	0.11	0.01	3E-03
		AP-42 Table 3.2-3	Benzene	0.01	1E-03	2E-04	---	0.01	1E-03	2E-04
		AP-42 Table 3.2-3	Ethylbenzene	1E-04	2E-05	4E-06	---	1E-04	2E-05	4E-06
		AP-42 Table 3.2-3	Formaldehyde	0.12	0.01	3E-03	---	0.12	0.01	3E-03
		AP-42 Table 3.2-3	n-Hexane	---	---	---	---	---	---	---
		AP-42 Table 3.2-3	Toluene	3E-03	4E-04	9E-05	---	3E-03	4E-04	9E-05
		AP-42 Table 3.2-3	2,2,4-TMP	---	---	---	---	---	---	---
		AP-42 Table 3.2-3	Xylenes	1E-03	1E-04	3E-05	---	1E-03	1E-04	3E-05
		AP-42 Table 3.2-3	Other HAPs	0.05	0.01	1E-03	---	0.05	0.01	1E-03
		Sum	Tot HAP	0.19	0.02	0.01	---	0.19	0.02	0.01
		AP-42 Table 3.2-3	CO2 (GWP=1)	676.98	73.43	18.36	---	676.98	73.43	18.36
		AP-42 Table 3.2-3	CH4 (GWP=25)	1.33	0.14	0.04	---	1.33	0.14	0.04
		40CFR§98 - Table C2	N2O (GWP=298)	1E-03	1E-04	3E-05	---	1E-03	1E-04	3E-05
		40CFR§98 - Table A-1	CO2e	710.64	77.08	19.27	---	710.64	77.08	19.27

Notes:
1 - As per NSPS JJJJ, NMNEHC (non-methane/non-ethane hydrocarbon) does not include HCHO. VOC is the sum of NMNEHC and formaldehyde (HCHO).
2 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
3 - HCHO is formaldehyde; Total HAP includes, but not limited to, HCHO, n-hexane, BTEX (benzene, toluene, ethylbenzene, xylene), acetaldehyde, acrolein, and MeOH (methanol).
4 - Only the calculations based on vendor guarantees (or applicable regulations) should be used to establish emission limitations.
5 - Total VOC, HAP and CO2e emissions include operations, cold-start, and crankcase emissions:

tpy	VOC	HCHO	n-Hex, TMP, BTEX (ea)	Tot HAP	CO2e
Operations	1.23E-02	3.22E-03	8.44E-04	5.07E-03	19.27
Cold Start	1.42E-02	---	2.33E-05	1.40E-04	9.62
Crankcase	6.17E-03	1.62E-03	5.04E-06	2.55E-03	9.69
Total	**3.26E-02**	**4.84E-03**	**8.73E-04**	**7.75E-03**	**38.58**

Emergency Generator Engine - Cold-Start/Crankcase (CSC)

Cold-Start Emissions (Fuel Gas)

Unit	Description	Engine "Cold-Start" Gas Volume scf/Start	SSM and Blowdown Events/yr	Total Gas Vented MMscf/yr	VOC 1,555.62 lb/MMscf lb/hr	VOC tpy	HCHO na lb/MMscf lb/hr	HCHO tpy	BTEX,Hex,TMP (ea) 2.56 lb/MMscf lb/hr	BTEX,Hex,TMP (ea) tpy	Total HAP 15.36 lb/MMscf lb/hr	Total HAP tpy	CO2 --- lb/MMscf lb/hr	CO2 tpy	CH4 42,275 lb/MMscf lb/hr	CH4 tpy	CO2e CO2 GWP = 1 CH4 GWP = 25 lb/hr	CO2e tpy
EmGen-01	Cold-Start	700	26	0.02	3E-03	0.01	na	na	5E-06	2E-05	3E-05	1E-04	---	---	0.09	0.38	2.20	9.62

Crankcase Emissions (Combustion Gas)

Unit	Description	bhp	Leak Rate 0.50 scf/bhp-hr MMscf/yr	Safety Factor	VOC 22.90 lb/MMscf lb/hr	VOC tpy	HCHO 6.01 lb/MMscf lb/hr	HCHO tpy	BTEX,Hex,TMP (ea) 0.58 lb/MMscf lb/hr	BTEX,Hex,TMP (ea) tpy	Total HAP 9.46 lb/MMscf lb/hr	Total HAP tpy	CO2 34,296 lb/MMscf lb/hr	CO2 tpy	CH4 67.43 lb/MMscf lb/hr	CH4 tpy	CO2e CO2 GWP = 1 CH4 GWP = 25 lb/hr	CO2e tpy
EmGen-01	Crankcase	49.2	0.22	250%	1E-03	0.01	4E-04	2E-03	4E-05	2E-04	6E-04	3E-03	2.11	9.24	4E-03	0.02	2.21	9.69
TOTAL FACILITY-WIDECSC SSM EMISSIONS:					**5E-03**	**0.02**	**4E-04**	**2E-03**	**4E-05**	**2E-04**	**6E-04**	**3E-03**	**2.11**	**9.24**	**0.09**	**0.40**	**4.41**	19.31

Notes:
1 - Cold-Start emissions are the unburned fuel resulting from start-up of idle gas-fired engines.
2 - Starting gas quantity (700 scf/start) as per Engineering Department.
3 - Emission estimates are based on: **0.5** cold -starts per week.
4 - Crankcase emissions are estimated as follows:

(Data from GM 3.0L Data Sheet and Emissions Calculation Spreadsheet)

Total Engine Exhaust: 250 acf/min 39.48 MMscf/yr*

Pollutant	GM 3.0L	Crankcase Emission Factor**
Crankcase VOC emissions	0.45 tpy VOC	22.90 lb VOC / MMscf
Crankcase HCHO emissions	0.12 tpy HCHO	6.01 lb HCHO / MMscf
Crankcase BTEX, n-Hex, TMP	1.1E-02 tpy BTEX, etc	0.58 lb BTEX, etc / MMscf
Crankcase HAP (tot) emission	0.19 tpy HAP	9.46 lb HAP / MMscf
Crankcase CO2 emissions	676.98 tpy CO2	34,296 lb CO2 / MMscf
Crankcase CH4 emissions	1.33 tpy CH4	67.43 lb CH4 / MMscf
Crankcase CO2e emissions	710.64 tpy CO2e	36,001 lb CO2e / MMscf

* Conversion from acf/min to scf/yr based on 8,760 hr/yr, 1,270 oF temp, and 60 oF std temp

** Crankcase Emission Factor (lb/MMscf) = GM 3.0L Pre-Controlled PTE (tpy) / MMscf/yr x 2000 lb/ton

Potentially Applicable

AP-42 and GHG EMISSION FACTORS

(Preferentially use test data or vendor data where available)

	Pollutant	Natural Gas-Fired Reciprocating Engines AP-42 Table 3.2-1; 3.2-2; 3.2-3 07/00			Stationary Gas-Fired Turbines 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	Lean Pre-Mix# lb/MMBtu
CRITERIA	NOx (≥ 90% Load)	3.17E+00	4.08E+00	2.21E+00	3.23E-01	9.91E-02
	CO (≥ 90% Load)	3.86E-01	3.17E-01	3.72E+00	8.23E-02	1.51E-02
	VOC (NMNEHC w/o Aldehydes*)	4.93E-02	5.17E-02	3.68E-03	2.06E-03	2.06E-03
	VOC (NMNEHC w/ Aldehydes*)	1.20E-01	1.18E-01	2.96E-02	2.82E-03	2.13E-03
	SO2 (2,000 gr-S/MMscf ≈ 0.0007 W%)	5.88E-04	5.88E-04	5.88E-04	3.20E-03	3.20E-03
	PM10/2.5 (Condensible and Filterable)	4.83E-02	9.99E-03	1.94E-02	6.63E-03	6.63E-03
HAPs	Acetaldehyde*	7.76E-03	8.36E-03	2.79E-03	4.00E-05	4.00E-05
	Acrolein*	7.78E-03	5.14E-03	2.63E-03	6.40E-06	6.40E-06
	Benzene	1.94E-03	4.40E-04	1.58E-03	1.20E-05	9.10E-07
	Butadiene, 1,3-	8.20E-04	2.67E-04	6.63E-04	4.30E-07	4.30E-07
	Ethylbenzene	1.08E-04	3.97E-05	2.48E-05	3.20E-05	3.20E-05
	Formaldehyde (HCHO)*	5.52E-02	5.28E-02	2.05E-02	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/PAH)	2.68E-04	3.74E-04	2.38E-04	3.47E-05	3.47E-05
	Toluene	9.63E-04	4.08E-04	5.58E-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
	Other/Trace HAP**	6.57E-04	3.21E-04	1.79E-04	2.90E-05	2.90E-05
	TOTAL HAP	7.95E-02	7.22E-02	3.24E-02	1.06E-03	3.57E-04
GHG	CO2 (GWP=1)	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	8.64E-03	8.64E-03
	N2O (GWP=298)	Use 40CFR§98	Use 40CFR§98	Use 40CFR§98	3.00E-03	3.00E-03
	CO2e	Use 40CFR§98	Use 40CFR§98	Use 40CFR§98	Use 40CFR§98	Use 40CFR§98

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

	Pollutant	Natural Gas (External) Combustion AP-42 Table 1.4-1; 1.4-2; 1.4-3 (<100 MMBtu/hr) 07/98			Industrial Flares 13.5-1 06/17	Diesel Engines 3.3-1; 3.3-2 10/96
		Uncontrolled lb/MMBtu	LoNOx Burners lb/MMBtu	Flue Gas Recirc lb/MMBtu	Combustion lb/MMBtu	Uncontrolled lb/MMBtu
CRITERIA	NOx (≥ 90% Load)	9.80E-02	4.90E-02	3.14E-02	Use Ext. Comb.	4.41E+00
	CO (≥ 90% Load)	8.24E-02	8.24E-02	8.24E-02	3.10E-01	9.50E-01
	VOC (NMNEHC w/o Aldehydes*)	5.32E-03	5.32E-03	5.32E-03		3.60E-01
	VOC (NMNEHC w/ Aldehydes*)	5.39E-03	5.39E-03	5.39E-03	Use Ext. Comb.	3.62E-01
	SO2 (2,000 gr-S/MMscf ≈ 0.0007 W%)	5.88E-04	5.88E-04	5.88E-04		2.90E-01
	PM10/2.5 (Condensible and Filterable)	7.45E-03	7.45E-03	7.45E-03		3.10E-01
HAPs	Acetaldehyde*	---	---	---	Use Ext. Comb.	7.67E-04
	Acrolein*	---	---	---		9.25E-05
	Benzene	2.06E-06	2.06E-06	2.06E-06		9.33E-04
	Butadiene, 1,3-	---	---	---		3.91E-05
	Ethylbenzene	---	---	---		---
	Formaldehyde (HCHO)*	7.35E-05	7.35E-05	7.35E-05		1.18E-03
	n-Hexane	1.76E-03	1.76E-03	1.76E-03		---
	Methanol (MeOH)	---	---	---		---
	Polycyclic Organic Matter (POM/PAH)	6.85E-07	6.85E-07	6.85E-07		1.68E-04
	Toluene	3.33E-06	3.33E-06	3.33E-06		4.09E-04
	Trimethylpentane, 2,2,4- (i-Octane)	---	---	---		---
	Xylenes	---	---	---		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		3.87E-03
GHG	CO2 (GWP=1)	1.18E+02	1.18E+02	1.18E+02	Use Ext. Comb.	1.64E+02
	CH4 (GWP=25)	2.25E-03	2.25E-03	2.25E-03		
	N2O (GWP=298)	2.16E-03	6.27E-04	6.27E-04		Use 40CFR§98
	CO2e	Use 40CFR§98	Use 40CFR§98	Use 40CFR§98		

Fuel Type	40CFR§98 - Default Greenhouse Gas (GHG) Emission Factors				
	Table C-1 to Subpart C of Part 98		Table C-2 to Subpart C of Part 98		Weighted Sum
	Default HHV	Carbon Dioxide lb CO2/MMBtu	Methane lb CH4/MMBtu	Nitrous Oxide lb N2O/MMBtu	CO2e lb CO2e/MMBtu
Fuel Oil No. 2 (Diesel)	138,000 Btu/gal	1.63E+02	6.61E-03	1.32E-03	1.64E+02
Propane	91,000 Btu/gal	1.39E+02	6.61E-03	1.32E-03	1.39E+02
Natural Gas	1,026 Btu/scf	1.17E+02	2.20E-03	2.20E-04	1.17E+02

* Aldehyde (not measured in EPA Test Method 25)

** Other/Trace HAPs include: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, ,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Naphthalene, Phenol, Propylene, Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

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

Supplement 04

Emission Program Results

(Not Applicable)

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

Supplement 05

Lab Analysis

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

- **Inlet Natural Gas Liquid (NGL) – Summary**
- **Inlet Natural Gas Liquid (NGL) – Lab Analysis**
- **Propane (C3) / Butane (C4) – Summary**
- **Natural Gasoline – Summary**
- **Natural Gasoline - Lab Analysis**
- **Natural Gasoline Tanks – Summary**
- **Stabilized Condensate Summary – Design Basis**
- **Stabilized Condensate Summary – Lab Analysis**
- **Fuel/Purge Gas – Summary**
- **Waste Gas (aka, Flare Gas) – Summary**
- **Waste Gas – BTU Analysis**

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 05

Inlet Natural Gas Liquid (NGL) - Summary

Representative NGL Composition (Moundsville Inlet Y-Grade) http://www.chemindustry.com/apps/chemicals

Component	CAS	Formula	Molecular Weight	Mole % (Vol %)	Mole Fraction	Weighted Sum	Weight %	lb/MMscf
Nitrogen	7727-37-9	N2	28.013	---	---	---	---	---
Hydrogen Sulfide	2148-87-8	H2S	34.086	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	---	---	---	---	---
Methane*	75-82-8	CH4	16.042	**0.0763**	0.000763	0.0122	0.0205	32.26
Ethane*	74-84-0	C2H6	30.069	**2.3581**	0.023581	0.7091	1.1880	1,868
Propane**	74-98-6	C3H8	44.096	**46.0594**	0.460594	20.3102	34.0279	53,521
i-Butane**	75-28-5	C4H10	58.122	**6.5815**	0.065815	3.8253	6.4090	10,080
n-Butane**	106-97-8	C4H10	58.122	**16.3411**	0.163411	9.4978	15.9127	25,028
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	**4.9585**	0.049585	3.5775	5.9938	9,427
n-Pentane**	109-66-0	C5H12	72.149	**6.4979**	0.064979	4.6882	7.8546	12,354
neo-Pentane	463-82-1	C5H12	72.149	---	---	---	---	---
Cyclohexane**	110-82-7	C6H12	84.159	**0.8709**	0.008709	0.7329	1.2280	1,931
Other Hexanes**	varies	C6H14	86.175	**3.5923**	0.035923	3.0957	5.1865	8,158
Methylcyclohexane**	varies	C7H14	98.186	**0.9580**	0.009580	0.9406	1.5759	2,479
Heptanes**	varies	C7H16	100.202	**4.1943**	0.041943	4.2028	7.0414	11,075
C8+ Heavies**	varies	C8+	130.000 est	**3.3658**	0.033658	4.3755	7.3308	11,530
Benzene***	71-43-2	C6H6	78.112	**0.0497**	0.000497	0.0388	0.0650	102
Ethylbenzene***	100-41-4	C8H10	106.165	**0.0254**	0.000254	0.0270	0.0452	71
n-Hexane***	110-54-3	C6H14	86.175	**3.3162**	0.033162	2.8577	4.7879	7,531
Toluene***	108-88-3	C7H8	92.138	**0.0836**	0.000836	0.0770	0.1291	203
2,2,4-TMP***	540-84-1	C8H18	114.229	**0.0751**	0.000751	0.0858	0.1437	226
Xylenes***	1330-20-7	C8H10	106.165	**0.5959**	0.005959	0.6326	1.0599	1,667
			Totals:	**100.00**	**1.0000**	**59.6868**	**100.00**	**157,285**
			THC:	**100.00**	**1.0000**	**59.6868**	**100.00**	**157,285**
			Total VOC:	**97.57**	**0.9757**	**58.9655**	**98.79**	**155,384**
			Total HAP:	**4.146**	**0.04146**	**3.7190**	**6.23**	**9,800**

* = 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:

Component	CAS	Formula	Representative Gas Analysis			Worst-Case (150%)		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	---	---	---	--	--	---
Methane	75-82-8	CH4	0.076	0.021	32.26	0.12	0.03	50
Ethane	74-84-0	C2H6	2.36	1.19	1,868	3.55	1.79	2,810
VOC	Various	C3+	97.57	98.79	155,384	100.00	100.00	157,290
Benzene	71-43-2	C6H6	0.05	0.07	102	0.08	0.10	160
Ethylbenzene	110-54-3	C6H14	0.03	4.5E-02	71	0.04	0.07	110
n-Hexane	100-41-4	C8H10	3.32	4.79	7,531	4.98	7.18	11,300
Toluene	108-88-3	C7H8	0.08	0.13	203	0.13	0.20	310
2,2,4-TMP	540-84-1	C8H18	0.08	0.14	226	0.11	0.22	340
Xylenes	1330-20-7	C8H10	0.60	1.06	1,667	0.90	1.60	2,510
Total HAP:	Various	C6 thru C8	4.15	6.23	9,800	6.23	9.37	14,730

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 05

Inlet Natural Gas Liquid (NGL) - Analysis

Williams Quality Control Facility

Extended Analysis by GPA 2186

Sample Information

	Sample Information
Sample Name	JP3 Y-Grade #7
Technician	Lab Technician
Method Name	GPA 2186
Injection Date	2014-06-30 13:19:03
Report Date	2014-06-30 13:58:32

Component Results

Component Name	Ret. Time	Peak Area	Norm Mole%	Norm Weight%	Norm Volume%
Methane	6.22	216.9	0.0763	0.0206	0.0400
Ethane	6.36	13298.4	2.3581	1.1956	1.9524
Propane	6.66	387756.8	46.0594	34.2452	39.2899
iso-Butane	7.17	76769.6	6.5815	6.4498	6.6652
n-Butane	7.55	193195.1	16.3411	16.0142	15.9495
iso-Pentane	8.85	74758.2	4.9585	6.0320	5.6191
n-Pentane	9.43	99331.1	6.4979	7.9047	7.2857
Hexanes Plus	0.00	0.0	17.1272	28.1379	23.1982
Total:			100.0000	100.0000	100.0000

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 05

Propane (C3) / Butane (C4) - Summary

Representative NGL Composition (Moundsville Inlet Y-Grade) http://www.chemindustry.com/apps/chemicals

Component	CAS	Formula	Molecular Weight	Mole % (Vol %)	Mole Fraction	Weighted Sum	Weight %	lb/MMscf
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	---	---	---	---	---
Propane**	74-98-6	C3H8	44.096	**50.0000**	0.500000	22.0478	43.1389	58,100
i-Butane**	75-28-5	C4H10	58.122	---	---	---	---	---
n-Butane**	106-97-8	C4H10	58.122	**50.0000**	0.500000	29.0611	56.8611	76,581
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	---	---	---	---	---
n-Pentane**	109-66-0	C5H12	72.149	---	---	---	---	---
neo-Pentane	463-82-1	C5H12	72.149	---	---	---	---	---
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+	130.000 est	---	---	---	---	---
Benzene***	71-43-2	C6H6	78.112	---	---	---	---	---
Ethylbenzene***	100-41-4	C8H10	106.165	---	---	---	---	---
n-Hexane***	110-54-3	C6H14	86.175	---	---	---	---	---
Toluene***	108-88-3	C7H8	92.138	---	---	---	---	---
2,2,4-TMP***	540-84-1	C8H18	114.229	---	---	---	---	---
Xylenes***	1330-20-7	C8H10	106.165	---	---	---	---	---
			Totals:	**100.00**	**1.0000**	**51.1089**	**100.00**	**134,681**
			THC:	**100.00**	**1.0000**	**51.1089**	**100.00**	**134,681**
			Total VOC:	**100.00**	**1.0000**	**51.1089**	**100.00**	**134,681**
			Total HAP:	**0.000**	**0.00000**	**0.0000**	**0.00**	**0**

* = 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:

Component	CAS	Formula	Representative Gas Analysis			Worst-Case (150%)		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	---	---	---	---	---	---
Methane	75-82-8	CH4	---	---	---	---	---	---
Ethane	74-84-0	C2H6	---	---	---	---	---	---
VOC	Various	C3+	100.00	100.00	134,681	100.00	100.00	134,690
Benzene	71-43-2	C6H6	---	---	---	---	---	---
Ethylbenzene	110-54-3	C6H14	---	---	---	---	---	---
n-Hexane	100-41-4	C8H10	---	---	---	---	---	---
Toluene	108-88-3	C7H8	---	---	---	---	---	---
2,2,4-TMP	540-84-1	C8H18	---	---	---	---	---	---
Xylenes	1330-20-7	C8H10	---	---	---	---	---	---
Total HAP:	Various	C6 thru C8	---	---	---	---	---	---

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 05

Natural Gasoline - Summary

Moundsville Analysis - Sampled 09/15/2014

Component	CAS	Formula	Molecular Weight	Mole % (Vol %)	Mole Fraction	Weighted Sum	Weight %	lb/MMscf
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	---	---	---	---	---
Propane**	74-98-6	C3H8	44.096	**0.0192**	0.000192	0.0085	0.0098	22
i-Butane**	75-28-5	C4H10	58.122	**0.0687**	0.000687	0.0399	0.0462	105
n-Butane**	106-97-8	C4H10	58.122	**2.9806**	0.029806	1.7324	2.0048	4,565
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	**18.8292**	0.188292	13.5851	15.7214	35,799
n-Pentane**	109-66-0	C5H12	72.149	**24.6865**	0.246865	17.8110	20.6119	46,935
neo-Pentane	463-82-1	C5H12	72.149	**0.3051**	0.003051	0.2201	0.2547	580
Cyclohexane**	110-82-7	C6H12	84.159	**2.9327**	0.029327	2.4682	2.8563	6,504
Other Hexanes**	varies	C6H14	86.175	**11.8202**	0.118202	10.1861	11.7879	26,842
Methylcyclohexane**	varies	C7H14	98.186	**3.0269**	0.030269	2.9720	3.4394	7,832
Heptanes**	varies	C7H16	100.202	**13.0771**	0.130771	13.1035	15.1641	34,530
C8+ Heavies**	varies	C8+	130.000 est	**11.0181**	0.110181	14.3236	16.5760	37,745
Benzene***	71-43-2	C6H6	78.112	**0.1709**	0.001709	0.1335	0.1545	352
Ethylbenzene***	100-41-4	C8H10	106.165	**0.0431**	0.000431	0.0458	0.0530	121
n-Hexane***	110-54-3	C6H14	86.175	**9.3299**	0.093299	8.0401	9.3044	21,187
Toluene***	108-88-3	C7H8	92.138	**0.5303**	0.005303	0.4886	0.5654	1,288
2,2,4-TMP***	540-84-1	C8H18	114.229	**0.2508**	0.002508	0.2865	0.3315	755
Xylenes***	1330-20-7	C8H10	106.165	**0.9105**	0.009105	0.9666	1.1186	2,547
			Totals:	**100.00**	**1.0000**	**86.4115**	**100.00**	**227,709**
			THC:	**100.00**	**1.0000**	**86.4115**	**100.00**	**227,709**
			Total VOC:	**100.00**	**1.0000**	**86.4115**	**100.00**	**227,709**
			Total HAP:	**11.236**	**0.11236**	**9.9611**	**11.53**	**26,249**

* = 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:

Component	CAS	Formula	Representative Gas Analysis			Worst-Case (150%)		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	---	---	---	--	--	---
Methane	75-82-8	CH4	---	---	---	--	--	---
Ethane	74-84-0	C2H6	---	---	---	--	--	---
VOC	Various	C3+	100.00	100.00	227,709	100.00	100.00	227,710
Benzene	71-43-2	C6H6	0.17	0.15	352	0.26	0.23	530
Ethylbenzene	100-41-4	C8H10	0.04	5.3E-02	121	0.07	0.08	190
n-Hexane	110-54-3	C6H14	9.33	9.30	21,187	14.00	13.96	31,790
Toluene	108-88-3	C7H8	0.53	0.57	1,288	0.80	0.85	1,940
2,2,4-TMP	540-84-1	C8H18	0.25	0.33	755	0.38	0.50	1,140
Xylenes	1330-20-7	C8H10	0.91	1.12	2,547	1.37	1.68	3,830
Total HAP:	Various	C6 thru C8	11.24	11.53	26,249	16.87	17.31	39,420

Natural Gasoline - Lab Analysis

Williams Quality Control Facility
Extended Analysis by GPA 2186

Sample Information

	Sample Information
Sample Name	Gas V-2951 020915 1245 - Ext
Corrosion	No Sample Submitted for Analysis
Vapor Pressure (calc), psia	10.99
Vapor Pressure (meas), psia	8.57
Saybolt Color	+22
Doctor's Test	Positive
Water Content, ppmw	21
Distillation, deg F	
10%	125.1
90%	513.9
FBP	619.3
Technician	Lab Technician
Method Name	Extended-Olefin Method - Diablo
Injection Date	2015-02-09 13:40:13
Report Date	2015-02-09 14:40:17

Component Results

Component Name	Ret. Time	Peak Area	Norm Mole%	Norm Weight%	Norm Volume%
Propane	6.45	5791.8	0.0192	0.0099	0.0131
iso-Butane	6.94	28550.4	0.0687	0.0469	0.0560
n-Butane	7.34	1277981.9	2.9806	2.0340	2.3418
iso-Pentane	8.67	9733985.4	18.8292	15.9503	17.1760
n-Pentane	9.30	12960134.9	24.6865	20.9121	22.2811
cis-2-butene/neo-Pentane	36.23	302673.2	0.3051	0.2010	0.2150
Hexanes Plus	0.00	0.0	53.1107	60.8458	57.9170
Total:			100.0000	100.0000	100.0000

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 05

Natural Gasoline Tanks - Summary

Composition of 10% Natural Gasoline Vapors and 90% Butane Vapor

Component	CAS	Formula	Molecular Weight	Mole % (Vol %)	Mole Fraction	Weighted Sum	Weight %	lb/MMscf
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	---	---	---	---	---
Propane**	74-98-6	C3H8	44.096	**0.0019**	0.000019	0.0008	0.0014	2
i-Butane**	75-28-5	C4H10	58.122	**0.0069**	0.000069	0.0040	0.0066	11
n-Butane**	106-97-8	C4H10	58.122	**90.2981**	0.902981	52.4832	86.1071	138,302
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	**1.8829**	0.018829	1.3585	2.2288	3,580
n-Pentane**	109-66-0	C5H12	72.149	**2.4687**	0.024687	1.7811	2.9222	4,694
neo-Pentane	463-82-1	C5H12	72.149	**0.0305**	0.000305	0.0220	0.0361	58
Cyclohexane**	110-82-7	C6H12	84.159	**0.2933**	0.002933	0.2468	0.4049	650
Other Hexanes**	varies	C6H14	86.175	**1.1820**	0.011820	1.0186	1.6712	2,684
Methylcyclohexane**	varies	C7H14	98.186	**0.3027**	0.003027	0.2972	0.4876	783
Heptanes**	varies	C7H16	100.202	**1.3077**	0.013077	1.3104	2.1498	3,453
C8+ Heavies**	varies	C8+	130.000 est	**1.1018**	0.011018	1.4324	2.3500	3,774
Benzene***	71-43-2	C6H6	78.112	**0.0171**	0.000171	0.0133	0.0219	35
Ethylbenzene***	100-41-4	C8H10	106.165	**0.0043**	0.000043	0.0046	0.0075	12
n-Hexane***	110-54-3	C6H14	86.175	**0.9330**	0.009330	0.8040	1.3191	2,119
Toluene***	108-88-3	C7H8	92.138	**0.0530**	0.000530	0.0489	0.0802	129
2,2,4-TMP***	540-84-1	C8H18	114.229	**0.0251**	0.000251	0.0286	0.0470	75
Xylenes***	1330-20-7	C8H10	106.165	**0.0911**	0.000911	0.0967	0.1586	255
			Totals:	**100.00**	**1.0000**	**60.9511**	**100.00**	**160,617**
			THC:	**100.00**	**1.0000**	**60.9511**	**100.00**	**160,617**
			Total VOC:	**100.00**	**1.0000**	**60.9511**	**100.00**	**160,617**
			Total HAP:	**1.124**	**0.01124**	**0.9961**	**1.63**	**2,625**

* = 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:

Component	CAS	Formula	Representative Gas Analysis			Worst-Case (150%)		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	---	---	---	--	--	---
Methane	75-82-8	CH4	---	---	---	--	--	---
Ethane	74-84-0	C2H6	---	---	---	--	--	---
VOC	Various	C3+	100.00	100.00	160,617	100.05	100.00	160,700
Benzene	71-43-2	C6H6	0.02	0.02	35	0.03	0.04	60
Ethylbenzene	100-41-4	C8H10	0.00	7.5E-03	12	0.01	0.01	20
n-Hexane	110-54-3	C6H14	0.93	1.32	2,119	1.40	1.98	3,180
Toluene	108-88-3	C7H8	0.05	0.08	129	0.08	0.12	200
2,2,4-TMP	540-84-1	C8H18	0.03	0.05	75	0.04	0.07	120
Xylenes	1330-20-7	C8H10	0.09	0.16	255	0.14	0.24	390
Total HAP:	Various	C6 thru C8	1.12	1.63	2,625	1.70	2.47	3,970

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 05

Stabilized Condensate Summary - Design Basis

Composition of 10% Natural Gasoline Vapors and 90% Butane Vapor

Component	CAS	Formula	Molecular Weight	Mole % (Vol %)	Mole Fraction	Weighted Sum	Weight %	lb/MMscf
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	---	---	---	---	---
Propane**	74-98-6	C3H8	44.096	**0.0192**	0.000192	0.0085	0.0098	22
i-Butane**	75-28-5	C4H10	58.122	**0.0687**	0.000687	0.0399	0.0462	105
n-Butane**	106-97-8	C4H10	58.122	**2.9806**	0.029806	1.7324	2.0048	4,565
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	**18.8292**	0.188292	13.5851	15.7214	35,799
n-Pentane**	109-66-0	C5H12	72.149	**24.6865**	0.246865	17.8110	20.6119	46,935
neo-Pentane	463-82-1	C5H12	72.149	**0.3051**	0.003051	0.2201	0.2547	580
Cyclohexane**	110-82-7	C6H12	84.159	**2.9327**	0.029327	2.4682	2.8563	6,504
Other Hexanes**	varies	C6H14	86.175	**11.8202**	0.118202	10.1861	11.7879	26,842
Methylcyclohexane**	varies	C7H14	98.186	**3.0269**	0.030269	2.9720	3.4394	7,832
Heptanes**	varies	C7H16	100.202	**13.0771**	0.130771	13.1035	15.1641	34,530
C8+ Heavies**	varies	C8+	130.000 est	**11.0181**	0.110181	14.3236	16.5760	37,745
Benzene***	71-43-2	C6H6	78.112	**0.1709**	0.001709	0.1335	0.1545	352
Ethylbenzene***	100-41-4	C8H10	106.165	**0.0431**	0.000431	0.0458	0.0530	121
n-Hexane***	110-54-3	C6H14	86.175	**9.3299**	0.093299	8.0401	9.3044	21,187
Toluene***	108-88-3	C7H8	92.138	**0.5303**	0.005303	0.4886	0.5654	1,288
2,2,4-TMP***	540-84-1	C8H18	114.229	**0.2508**	0.002508	0.2865	0.3315	755
Xylenes***	1330-20-7	C8H10	106.165	**0.9105**	0.009105	0.9666	1.1186	2,547
			Totals:	**100.00**	**1.0000**	**86.4115**	**100.00**	**227,709**
			THC:	**100.00**	**1.0000**	**86.4115**	**100.00**	**227,709**
			Total VOC:	**100.00**	**1.0000**	**86.4115**	**100.00**	**227,709**
			Total HAP:	**11.236**	**0.11236**	**9.9611**	**11.53**	**26,249**

* = 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:

Component	CAS	Formula	Representative Gas Analysis			Worst-Case (150%)		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	---	---	---	---	---	---
Methane	75-82-8	CH4	---	---	---	---	---	---
Ethane	74-84-0	C2H6	---	---	---	---	---	---
VOC	Various	C3+	100.00	100.00	227,709	100.04	100.00	227,800
Benzene	71-43-2	C6H6	0.17	0.15	352	0.26	0.23	530
Ethylbenzene	100-41-4	C8H10	0.04	5.3E-02	121	0.07	0.08	190
n-Hexane	110-54-3	C6H14	9.33	9.30	21,187	14.00	13.96	31,790
Toluene	108-88-3	C7H8	0.53	0.57	1,288	0.80	0.85	1,940
2,2,4-TMP	540-84-1	C8H18	0.25	0.33	755	0.38	0.50	1,140
Xylenes	1330-20-7	C8H10	0.91	1.12	2,547	1.37	1.68	3,830
Total HAP:	Various	C6 thru C8	11.24	11.53	26,249	16.87	17.31	39,420

Supplement 05
Stabilized Condensate Summary - Lab Analysis

Williams Quality Control Facility
Extended Analysis by GPA 2186

Sample Information

	Sample Information
Sample Name	Gas V-2951 020915 1245 - Ext
Corrosion	No Sample Submitted for Analysis
Vapor Pressure (calc), psia	10.99
Vapor Pressure (meas), psia	8.57
Saybolt Color	+22
Doctor's Test	Positive
Water Content, ppmw	21
Distillation, deg F	
10%	125.1
90%	513.9
FBP	619.3
Technician	Lab Technician
Method Name	Extended-Olefin Method - Diablo
Injection Date	2015-02-09 13:40:13
Report Date	2015-02-09 14:40:17

Component Results

Component Name	Ret. Time	Peak Area	Norm Mole%	Norm Weight%	Norm Volume%
Propane	6.45	5791.8	0.0192	0.0099	0.0131
iso-Butane	6.94	28550.4	0.0687	0.0469	0.0560
n-Butane	7.34	1277981.9	2.9806	2.0340	2.3418
iso-Pentane	8.67	9733985.4	18.8292	15.9503	17.1760
n-Pentane	9.30	12960134.9	24.6865	20.9121	22.2811
cis-2-butene/neo-Pentane	36.23	302673.2	0.3051	0.2010	0.2150
Hexanes Plus	0.00	0.0	53.1107	60.8458	57.9170
Total:			100.0000	100.0000	100.0000

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 05

Fuel/Purge Gas - Summary

Component	CAS	Formula	Molecular Weight	Mole % (Vol %)	Mole Fraction	Weighted Sum	Weight %	lb/MMscf
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	**95.3860**	0.953822	15.3016	91.5713	40,322.46
Ethane*	74-84-0	C2H6	30.069	**4.4760**	0.044758	1.3458	8.0540	3,546.51
Propane**	74-98-6	C3H8	44.096	**0.1420**	0.001420	0.0626	0.3747	165.00
i-Butane**	75-28-5	C4H10	58.122	---	---	---	---	---
n-Butane**	106-97-8	C4H10	58.122	---	---	---	---	---
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	---	---	---	---	---
n-Pentane**	109-66-0	C5H12	72.149	---	---	---	---	---
neo-Pentane***	463-82-1	C5H12	72.149	---	---	---	---	---
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+	130.000 est	---	---	---	---	---
Benzene***	71-43-2	C6H6	78.112	---	---	---	---	---
Ethylbenzene***	100-41-4	C8H10	106.165	---	---	---	---	---
n-Hexane***	110-54-3	C6H14	86.175	---	---	---	---	---
Toluene***	108-88-3	C7H8	92.138	---	---	---	---	---
2,2,4-TMP***	540-84-1	C8H18	114.229	---	---	---	---	---
Xylenes***	1330-20-7	C8H10	106.165	---	---	---	---	---
			Totals:	**100.00**	**1.0000**	**16.7101**	**100.00**	**44,034**
			THC:	**100.00**	**1.0000**	**16.7101**	**100.00**	**44,034**
			Total VOC:	**0.14**	**0.0014**	**0.0626**	**0.37**	**165**
			Total HAP:	**0.000**	**0.00000**	**0.0000**	**0.00**	**0**

* = 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:

Component	CAS	Formula	Representative Gas Analysis			Worst-Case (150%)		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	---	CO2	---	---	---	--	--	---
Methane	75-82-8	CH4	95.39	91.57	40,322	100.00	100.00	42,275
Ethane	74-84-0	C2H6	4.48	8.05	3,547	6.82	12.26	5,400
VOC	Various	C3+	0.14	0.37	165	0.26	1.00	300
Benzene	71-43-2	C6H6	---	---	---	--	--	---
Ethylbenzene	110-54-3	C6H14	---	---	---	--	--	---
n-Hexane	100-41-4	C8H10	---	---	---	--	--	---
Toluene	108-88-3	C7H8	---	---	---	--	--	---
2,2,4-TMP	540-84-1	C8H18	---	---	---	--	--	---
Xylenes	1330-20-7	C8H10	---	---	---	--	--	---
Total HAP:	Various	C6 thru C8	---	---	---	--	--	---

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 05

Waste Gas (aka, Flare Gas) - Summary

Representative Waste Gas Composition

Component	CAS	Formula	Molecular Weight	Mole % (Vol %)	Mole Fraction	Weighted Sum	Weight %	lb/MMscf
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	10.5142	0.105142	1.6867	2.9467	4,444.82
Ethane*	74-84-0	C2H6	30.069	1.3262	0.013262	0.3988	0.6966	1,050.81
Propane**	74-98-6	C3H8	44.096	26.2988	0.262987	11.5966	20.2590	30,558.96
i-Butane**	75-28-5	C4H10	58.122	2.3388	0.023388	1.3594	2.3748	3,582.18
n-Butane**	106-97-8	C4H10	58.122	33.9237	0.339235	19.7171	34.4454	51,957.93
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.149	4.7626	0.047625	3.4361	6.0028	9,054.74
n-Pentane**	109-66-0	C5H12	72.149	6.2430	0.062430	4.5042	7.8688	11,869.39
neo-Pentane***	463-82-1	C5H12	72.149	0.0488	0.000488	0.0352	0.0614	92.69
Cyclohexane**	110-82-7	C6H12	84.159	0.7767	0.007767	0.6536	1.1419	1,722.42
Other Hexanes**	varies	C6H14	86.175	3.1594	0.031593	2.7226	4.7563	7,174.45
Methylcyclohexane**	varies	C7H14	98.186	0.8225	0.008225	0.8076	1.4108	2,128.14
Heptanes**	varies	C7H16	100.202	3.5731	0.035731	3.5803	6.2548	9,434.76
C8+ Heavies**	varies	C8+	130.000 est	2.9511	0.029511	3.8364	6.7021	10109.52
Benzene***	71-43-2	C6H6	78.112	0.0449	0.000449	0.0351	0.0613	92.39
Ethylbenzene***	100-41-4	C8H10	106.165	0.0159	0.000159	0.0168	0.0294	44.40
n-Hexane***	110-54-3	C6H14	86.175	2.6638	0.026638	2.2955	4.0102	6,049.04
Toluene***	108-88-3	C7H8	92.138	0.1143	0.001143	0.1053	0.1840	277.54
2,2,4-TMP (i-Octane)***	540-84-1	C8H18	114.229	0.0666	0.000666	0.0761	0.1330	200.59
Xylenes***	1330-20-7	C8H10	106.165	0.3563	0.003563	0.3782	0.6607	996.67
		Totals:		**100.00**	**1.0000**	**57.2416**	**100.00**	**150,841**
		THC:		**100.00**	**1.0000**	**57.2416**	**100.00**	**150,841**
		Total VOC:		**88.16**	**0.8816**	**55.1561**	**96.36**	**145,346**
		Total HAP:		**3.262**	**0.03262**	**2.9071**	**5.08**	**7,661**

* = 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:

Component	CAS	Formula	Representative Gas Analysis			Worst-Case (100%)		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	---	---	---	--	--	---
Methane	75-82-8	CH4	10.51	2.95	4,445	10.64	2.98	4,500
Ethane	74-84-0	C2H6	1.33	0.70	1,051	1.39	0.73	1,100
VOC	Various	C3+	88.16	96.36	145,346	100.00	100.00	145,400
Benzene	71-43-2	C6H6	0.04	0.06	92	0.05	0.07	100
Ethylbenzene	100-41-4	C8H10	0.02	0.03	44	0.02	0.03	50
n-Hexane	110-54-3	C6H14	2.66	4.01	6,049	2.66	4.01	6,050
Toluene	108-88-3	C7H8	0.11	0.18	278	0.12	0.19	280
2,2,4-TMP (i-Octane)	540-84-1	C8H18	0.07	0.13	201	0.07	0.14	210
Xylenes	1330-20-7	C8H10	0.36	0.66	997	0.36	0.66	1,000
Total HAP:	Various	C6 thru C8	3.26	5.08	7,661	3.27	5.10	7,690

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement 05

Waste Gas - BTU Analysis

Waste Gas Streams Disposed in Flare 02 (5S (FL-02))

Gas Processors Suppliers Association (GPSA) - Engineering Data Handbook Volume II

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

Component	Component Btu/scf		NGL Flow: 68.1 MMscfy Flow: 7,779 scfh 35.4%		Propane/Butane Flow: 38.5 MMscfy Flow: 4,394 scfh 20.0%		Natural Gasoline Flow: 21.7 MMscfy Flow: 2,482 scfh 11.3%		Nat. Gasoline Tanks Flow: 37.8 MMscfy Flow: 4,320 scfh 19.6%		Condensate Flow: 5.3 MMscfy Flow: 600 scfh 2.7%		Fuel / Purge Gas Flow: 21.2 MMscfy Flow: 2,418 scfh 11.0%		Total Waste Gas Flow: 192.7 MMscfy Flow: 21,993 scfh 100.0%	
	LHV	HHV	Mole %	Btu/scf	Mole %	Btu/scf	Mole %	Btu/scf	Mole %	Btu/scf	Mole %	Btu/scf	Mole %	Btu/scf	Mole %	Btu/scf
Nitrogen	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hydrogen Sulfide	586.8	637.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Carbon Dioxide	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Methane*	909.4	1,010.0	0.0763	0.77	—	—	—	—	—	—	—	—	95.3860	963.40	10.5142	106.19
Ethane*	1,618.7	1,769.7	2.3581	41.73	—	—	—	—	—	—	—	—	4.4760	79.21	1.3262	23.47
Propane**	2,314.9	2,516.2	46.0594	1,158.95	50.0000	1,258.10	0.0192	0.48	0.00	0.05	0.0192	0.48	0.1420	3.57	26.2988	661.73
i-Butane**	3,000.4	3,252.0	6.5815	214.03	—	—	0.0687	2.23	0.01	0.22	0.0687	2.23	—	—	2.3388	76.06
n-Butane**	3,010.8	3,262.4	16.3411	533.11	50.0000	1,631.20	2.9806	97.24	90.30	2,945.88	2.9806	97.24	—	—	33.9237	1,106.73
Cyclopentane**	3,512.0	3,763.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—
i-Pentane**	3,699.0	4,000.9	4.9585	198.38	—	—	18.8292	753.34	1.88	75.33	18.8292	753.34	—	—	4.7626	190.55
n-Pentane**	3,706.9	4,008.7	6.4979	260.48	—	—	24.6865	989.61	2.47	98.96	24.6865	989.61	—	—	6.2430	250.26
neo-Pentane	3,682.9	3,984.8	—	—	—	—	0.3051	12.16	0.03	1.22	0.3051	12.16	—	—	0.0488	1.94
Cyclohexane**	4,189.4	4,491.5	0.8709	39.12	—	—	2.9327	131.72	0.29	13.17	2.9327	131.72	—	—	0.7767	34.88
Other Hexanes**	4,392.4	4,744.6	3.5923	170.44	—	—	11.8202	560.82	1.18	56.08	11.8202	560.82	—	—	3.1594	149.90
Methylcyclohexane**	4,863.6	5,215.9	0.9580	49.97	—	—	3.0269	157.88	0.30	15.79	3.0269	157.88	—	—	0.8225	42.90
Heptanes**	5,090.9	5,493.5	4.1943	230.41	—	—	13.0771	718.39	1.31	71.84	13.0771	718.39	—	—	3.5731	196.29
C8+ Heavies**	5,814.8	6,254.5	3.3658	210.51	—	—	11.0181	689.13	1.10	68.91	11.0181	689.13	—	—	2.9511	184.58
Benzene***	3,590.9	3,741.9	0.0497	1.86	—	—	0.1709	6.39	0.02	0.64	0.1709	6.39	—	—	0.0449	1.68
Ethylbenzene***	4,970.4	5,222.0	0.0254	1.33	—	—	0.0431	2.25	0.00	0.23	0.0431	2.25	—	—	0.0159	0.83
n-Hexane***	4,403.8	4,756.0	3.3162	157.72	—	—	9.3299	443.73	0.93	44.37	9.3299	443.73	—	—	2.6638	126.69
Toluene***	4,273.7	4,474.9	0.0836	3.74	—	—	0.5303	23.73	0.05	2.37	0.5303	23.73	—	—	0.1143	5.12
2,2,4-TMP (i-Octane)***	5,778.9	6,248.9	0.0751	4.69	—	—	0.2508	15.67	0.03	1.57	0.2508	15.67	—	—	0.0666	4.16
Xylenes***	4,957.1	5,208.7	0.5959	31.04	—	—	0.9105	47.42	0.09	4.74	0.9105	47.42	—	—	0.3563	18.56
			100.00		100.00		100.00		100.00		100.00		100.00		100.00	

	NGL	Propane/Butane	Natural Gasoline	Nat. Gasoline Tanks	Condensate	Fuel / Purge Gas	Total Waste Gas
Btu/scf (HHV):	3,308	2,889	4,652	3,401	4,652	1,046	3,183
LHV/HHV:	92.3%	92.1%	92.7%	92.3%	92.7%	90.1%	92.1%
Btu/scf (LHV):	3,052	2,662	4,311	3,140	4,311	943	2,930
MMBTU/hr (HHV):	25.73	12.69	11.55	14.69	2.79	2.53	69.99
MMBTU/hr (LHV):	23.74	11.70	10.70	13.57	2.59	2.28	64.43
TOTAL lb/MMscf:	157,285	134,690	227,710	160,700	227,800	44,034	150,841
VOC lb/MMscf:	157,290	134,690	227,710	160,700	227,800	300	145,400
HAP lb/MMscf:	14,730	---	39,420	3,970	39,420	---	7,690
Btu/lb (HHV):	21,034	21,451	20,430	21,166	20,422	23,759	21,098
Btu/lb (LHV):	19,404	19,766	18,931	19,542	18,923	21,407	19,423

Supplement 06

Vendor Data

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

Heater Specifications:

- Frac2 – Hot Oil Heaters (2-HTR (2E))

Flare Specifications:

- New Process Flare – Zeeco Elevated Flare (FL-02 (5S (5E))

Engine Specifications:

- Emergency Generator Engine – 49.2 Kohler/GM Vortec 3.0L (EG-1 (6S)(6E))

2.0 PROCESS DESIGN CONDITIONS

2.1. Process Design (Coil)

Media	Therminol 59
Flow rate (Lb./Hr.)	313,400
Operating pressure (PSIA)	40
Inlet temperature (°F)	313
Outlet temperature (°F)	500
Coil Terminal size/type (IN.)	8" / 300# RF
Process Passes	Single
Design pressure (PSIG)	150
Design temperature (°F)	20 to 600
Size	8" Sch 40
Material (SMLS PIPE)	SA-106B
Calculated pressure drop (PSI)	9.3
Coil heat flux (BTU/HR-SQ.FT.)	Cale. 12,859
Net thermal eff. @Design Duty	80.6 (w/ 2% setting loss)
Radiography: (Coil)	100%
Con-. Allow.	0.0625"
Coil Code	ASME Sect. 8

2.2 Heater

Heater duty (MMBTU/HR)	36.7	Heat Input = Duty / Efficiency
Calculated duty (MMBTU/HR)	36.7	= 36.7 / 0.806
Turndown	10:1	= 45.54 MMBtu/hr

2.3 Preliminary Instrument Set Points

Tag#	Set Point	Description
PCV-100	4-6 PSI	Fuel Gas Regulation
PCV-101	6-8"" W.C.	Pilot Gas Regulation
PCV-200	5 PSI	Blanket Gas Inlet
PCV-201	20PSI	Blanket Gas Back-Pressure
PSV-200	65 PSI	Thermal Relief Valve
PSLL-100	15" W.C. (Dec.)	Low Fuel Gas Pressure
PSLL-101	14" WC (Dec.)	Low Comb. Air Pressure
PSHH-100	45" W.C. (Inc.)	High Fuel Gas Pressure
TSHH-101	515F	High Process Temp.
TSHH-102	975-1200F	High Exhaust Temp.
FALL-200	(By Others)	Process Low-Low Flow
TIC-200	4F	Process Temp. Control

These settings / readings are PRELIMINARY only, and are subject to change. Operating conditions may warrant changes after start-up, and again as atmospheric conditions change. Refer to vender literature for adjustment methods.

2-HTR - Frac2 Hot Oil Heater

Aleksa, Deborah M

From: Jeff Oliver [joliver@Heatec.com]
Sent: Wednesday, March 06, 2013 6:49 AM
To: Matthews, Jeff; Ferraro, Christopher
Cc: Aleksa, Deborah M; Johnson, Johnny
Subject: RE: Emissions info

Jeff,

HHV fired input

Sincerely,

Jeff Oliver
Southeast Regional Sales Manager
o: 423-821-5200
f: 423-821-7873
c: 423-667-2273
Email: joliver@heatec.com
www.heatec.com

From: Matthews, Jeff [mailto:jeff.matthews@urs.com]
Sent: Monday, March 04, 2013 4:52 PM
To: Jeff Oliver; Ferraro, Christopher
Cc: Aleksa, Deborah M; Johnson, Johnny
Subject: RE: Emissions info
Importance: High

Could you please let us know whether these emission rates are based on Absorbed, Fired (LHV), or Fired (HHV)?

Jeff Matthews, P.E.
Technology Manager
URS Corporation
Work: 303-843-3041
Cell: 720-648-7717
Email: Jeff.Matthews@urs.com
http://www.urscorp.com

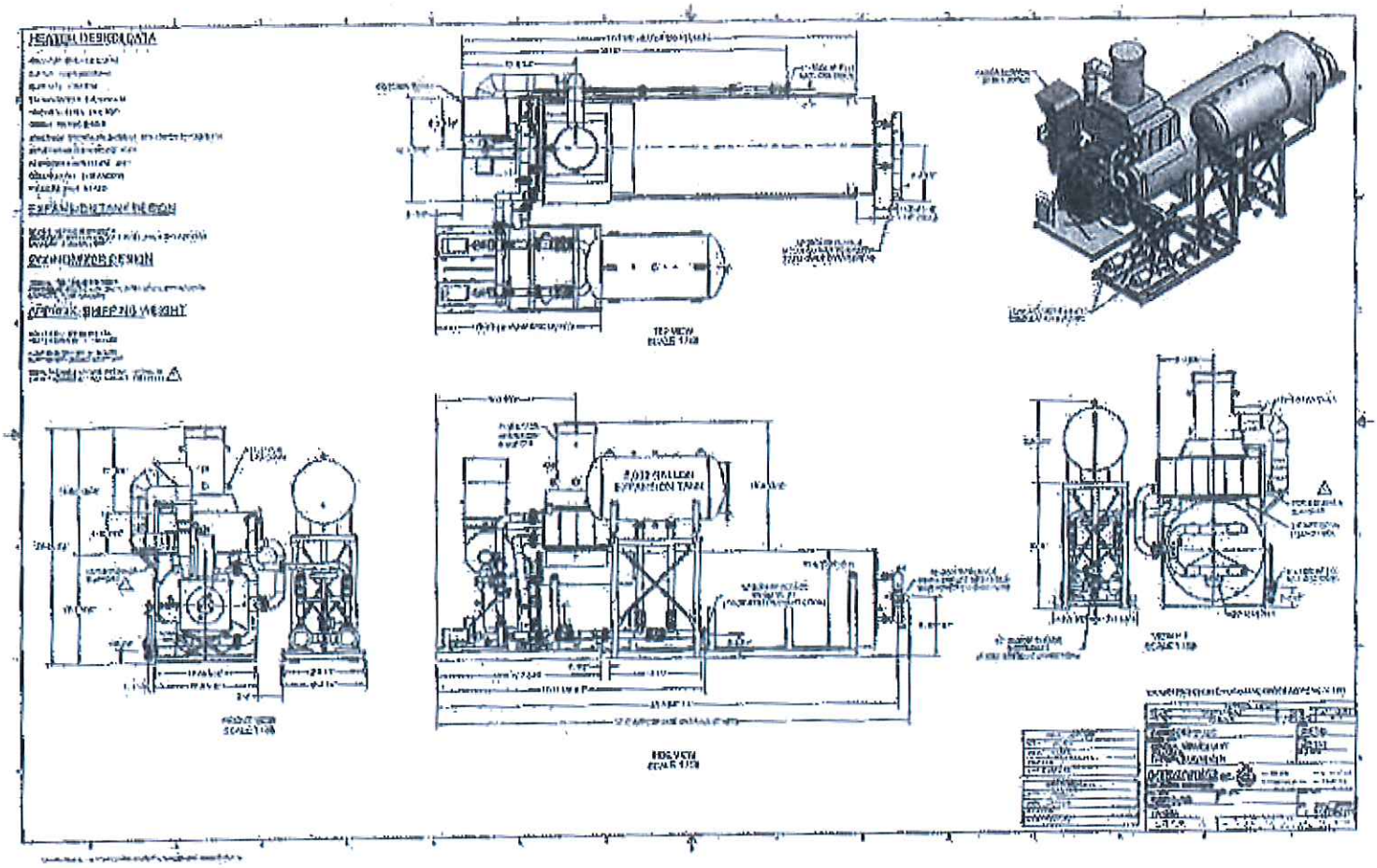
From: Jeff Oliver [mailto:joliver@Heatec.com]
Sent: Tuesday, February 26, 2013 7:00 AM
To: Ferraro, Christopher
Cc: Matthews, Jeff; Aleksa, Deborah M; Johnson, Johnny
Subject: RE: Emissions info

Below are typical emission levels for a burner like this.

	Natural Gas	
	Lbs/MMBTU	PPM
NOx	0.036	30
CO	0.074	100
VOC	0.004	
Particulates	0.01	

Parts Per Million (PPM) @ 3% O2 Dry

2-HTR - Frac2 Hot Oil Heater



2-HTR - Frac2 Hot Oil Heater

Used 89.85 MMBTU/Hr
Capacity Each Heater

Provider of Quality Heating Equipment, Engineering, Service & Expertise since 1977

HEATEC, INC.
P.O. BOX 72710 • CHATTANOOGA, TN 37407
5200 WILSON ROAD • CHATTANOOGA, TN 37410

HEATEC

EQUIPMENT DESIGN DATA:

The equipment will be designed to meet the following criteria. (Values are per each heater & for the single triplex pump skid total.)

Heater Capacity (Btu/hr) (MW)	70,076,952	20.54
Heater Circulation Rate (Gal/min) (m^3/hr)	1,980	450
Heater Inlet Temperature (°F) (°C)	250	121
Heater Outlet Temperature (°F) (°C)	400	204
Minimum Allowable Circulation Rate (Gal/min) (m^3/hr) 80 %	1,584	360
Input (LHV) (Btu/hr) (MW)	88,366,653	25.90
Stack Temperature (°F) (°C)	542	283
Calculated Heater Efficiency % LHV [See Note 1]	88	88
Calculated Heater Efficiency % HHV [See Note 1]	79	79
User / Valve / Pipe ΔP (psid) (kPa) [See Note 2]	40	276
Heater Calculated ΔP (psid) (kPa) (Clean)	13	87
Pump Head Design (psid) (kPa)	53	363
Heater Volume (Gallons) (m^3)	2,675	10
Tank Cold Volume (Gallons) (m^3)	1,250	5
User Volume (Gallons) (m^3) [See Note 2]	4,901	19
Total Volume (Gallons) (m^3)	8,826	33
Tank Capacity (Gallons) (m^3)	5,000	19
Total Surface Area (ft^2) (m^2)	7,735	719
Overall Flux Rate (Btu/hr-ft^2) (kW/m^2)	9,059	29
Radiant Surface Area (ft^2) (m^2)	1,717	160
Average Radiant Flux Rate (Btu/hr-ft^2) (kW/m^2) AICHE	21,913	69
Maximum Radiant Flux Rate (Btu/hr-ft^2) (kW/m^2) AICHE	29,583	93
Maximum Metal Temperature (°F) (°C) AICHE	558	292
Maximum Film Temperature (°F) (°C) AICHE	533	278
Combustion Loading (Btu/hr-ft^3) (kW/m^3)	33,727	349
Average Flue Gas Velocity Across Insulation (ft/s) (m/s)	90	28
Average Oil Velocity (ft/s) (m/s)	8	3

Note 1: Based on HHV of typical natural gas. Guaranteed efficiency is 1% less.

Note 2: Customer to confirm their equipment volume and pressure drop, which are not in Heatec's scope of supply.

2-HTR - Frac2 Hot Oil Heater

Used 54.00 MMBtu/Hr
Average Each Heater

Provider of Quality Heating Equipment, Engineering, Service & Expertise since 1977

HEATEC, INC.
P.O. BOX 72760 • CHATTANOOGA, TN 37407
6736 WILSON ROAD • CHATTANOOGA, TN 37410

HEATEC®

	IP UNITS	SI UNITS
Heater Capacity (Btu/hr) (MW)	**43,200,000**	**12.66**
Heater Circulation Rate (Lb/hr) (kg/hr)	773,784	350,890
Heater Circulation Rate (Gal/min) (m^3/hr)	1,980	450
Heater Inlet Temperature (°F) (°C)	307	153
Heater Outlet Temperature (°F) (°C)	400	204
Minimum Allowable Circulation Rate (Gal/min) (m^3/hr) 80 %	1,584	360
Minimum Allowable Circulation Rate (Gal/min) (m^3/hr) 5 fps	1,247	283
Input (HHV) (Btu/hr) (MW)	53,189,496	15.59
Stack Temperature (°F) (°C)	448	231
Calculated Heater Efficiency % LHV [See Note 1]	**90**	**90**
Calculated Heater Efficiency % HHV [See Note 1]	81	81
User / Valve / Pipe ΔP (psid) (kPa) [See Note 2]	37	255
Heater Calculated ΔP (psid) (kPa) (Clean)	19	130
Pump Head Design (psid) (kPa)	56	385
Heater Volume (Gallons) (m^3)	2,606	10
Tank Cold Volume (Gallons) (m^3)	19	0
User Volume (Gallons) (m^3) [See Note 2]	4,901	19
Total Volume (Gallons) (m^3)	7,526	28
Tank Capacity (Gallons) (m^3)	75	0
Total Surface Area (ft^2) (m^2)	8,487	789
Overall Flux Rate (Btu/hr-ft^2) (kW/m^2)	5,090	16
Radiant Surface Area (ft^2) (m^2)	1,717	160
Average Radiant Flux Rate (Btu/hr-ft^2) (kW/m^2) AICHE	14,898	47
Maximum Radiant Flux Rate (Btu/hr-ft^2) (kW/m^2) AICHE	20,112	63
Maximum Metal Temperature (°F) (°C) AICHE	502	261
Maximum Film Temperature (°F) (°C) AICHE	485	252
Combustion Loading (Btu/hr-ft^3) (kW/m^3)	20,301	210
Average Film Coefficient (Btu/hr-ft^2-F) (W/m^2-K)	237	1,345
Average Reynolds Number	261,428	261,428
Average Flue Gas Velocity Across Insulation (ft/s) (m/s)	49	15
Average Oil Velocity (ft/s) (m/s)	8	2
Average Prandtl Number	23	23
H/W or L/D Ratio	4	4

URS	Williams Moundsville, WV	Doc. Number:	30917-40-15-07-210-001
		Rev.	2

URS

Moundsville Fractionator and Terminal

Flare

Mechanical Equipment Data Sheet Package for Permanent Flare

DOC. # 30917-40-15-07-210-001

REV.	DESCRIPTION	BY	CHKD	PRO/SDE/PEM	DATE
2	Updated Process Conditions	RMW	CJC	JSM/CJF/EMS	5/7/13
1	Added warehouse spare air assist blower	HDP	CJC	JSM/CJF/EMS	2/19/2013
0	Issued for Purchase	CJC	RMW	JSM/CJF/EMS	1/31/2013
B	Issued for Bid	CJC	HDP	RMW	11/8/2012
A	Issued for IDR	CJC		RMW	11/5/2012

Revisions

CLIENT:	Williams
PROJECT:	Moundsville Fractionator and Terminal
URS JOB NO.:	30917-40

					FLARE API 537	DATASHEET NO.		REV
						30917-40-16-07-210-001		2
NO.	BY	DATE	REVISION	SHEET	OF	DATE
A	CJC	11/5/12	Issued for IDR	1	12	4/08/13
B	CJC	11/8/12	Issued for Bid	BY	CHK'D	APPR
0	CJC	1/31/13	Issued for Purchase			
1	HDP	2/19/13	Added warehouse spare blower	P.O.		
2	RMW	4/08/13	Updated Process Conditions	REQ		
				VENDOR		
				SIZE	By vendor	

1	TAG	FL-1241	SERVICE DESC	Permanent Flare	
2			MANUFACT'R	Zeeco	
3	PROJ	30811	MODEL NUM	AFTA-24/56	

	PURCHASER SUPPLIED - GENERAL INFORMATION			
4				
5		Note		REV
6	Purchaser		URS Energy and Construction	
7	Reference Number		N/A	
8	Plant Owner / Operator		Williams	0
9	Reference Number		N/A	
10	Vendor Reference Number		T24495F	0
11				
12				
13	Jobsite Location		Moundsville, WV	
14	Jobsite Climate		Humid Continental	
15	Unit Tag		N/A	
16	Equipment Number		FL-1241	2
17	Service		Permanent Flare	
18	Quantity Required		One	
19	Is Smokeless Required? (Yes/No)		Yes - Ringelmann 1, see sheet 4 for capacity	
20	Preferred Smokeless Method		Air assist	
21	Local Codes			B
22	Is P&ID Attached? (Yes/No)		No	
23				
24				
25	Ambient Conditions			
26	Maximum Recorded Temperature °F		99	
27	Minimum Recorded Temperature °F		-20	
28	Minimum Design Temperature (winterization) °F		-20	
29	Minimum Design Metal Temperature °F	9	-50	
30	Summer Max. Design Temperature (dry bulb) °F		100	
31	Relative Humidity %		100 max, 85 ave, 10 min	B
32	Wind Speed, Yearly mean mph	11	11.2	
33	Predominant Wind, (Y/N / Direction)		West	
34	Peak Solar Radiation Btu/h-ft^2	31	250	B
35	Include Solar w/ Flare Radiation (Yes/No)	31	Yes	B
36	Jobsite Elevation ft above sea level		696	
37	Average Barometric Pressure psia		14.33	
38				
39				
40	Structural code		IBC 2009 / ASCE 7-05	B
41	Wind			
42	Exposure Factor		C	
43	Occupancy Factor		III	
44	Structural designs wind speed (3 sec gust) mph		90	B
45	Importance Factor		1.0	
46				
47				
48	Seismic			
49	Site Class		D	B
50	Ocupancy Category		III	
51	Importance Factor		1.25	
52	S_s		10.2% g	
53	S_1		5.5% g	
54	F_a		1.6	
55	F_v		2.4	
56				
57				
58				
59				
60				
61				
62				

	TAG NO.	FL-1241	FLARE API 537	DATASHEET NO. 30917-40-15-07-210-001	REV 2	SHT 2	OF 12	
1	PURCHASER SUPPLIED - GENERAL INFORMATION (Continued)							
2			Note					REV
3	Minimum Flare Height	ft		190				0
4	Anticipated Flare Header Diameter	inch		24				0
5	Approx. Flare Header Length	ft		450				
6	Flare Header Network Volume	ft^3		not available				
7	Plot Space Available, (Length/Width)			300 ft radius				
8	Aircraft Warning Lights Required? (Yes/No)			No (if height is under 200 feet)				
9								
10								
11	Welding Code			ASME BPVC, Section IX, Welding				
12	Weld Inspection			ASME BPVC, Section V, AWS D1.1, API 537				
13	Surface Prep. & Paint Requirements		14	See note				
14	Special Erection Requirements			By vendor				
15								
	Flare Inlet Nozzle Location Above Grade	ft		25				0
16								
17	Nozzle Loads on Flare Inlet							
18	Fx, Fy, Fz	lb		Per API 537				0
19	Mx, My, Mz	ft-lb		Per API 537				0
20	Special Piping Treatment							
	Fireproofing			N/A				
21								
	Insulation			N/A				
22								
23	Supports			pipe supports for all pilot, FFG, and electrical conduit on stack to be provided by Seller				
24	Covering			N/A				
25	Heat Tracing (Elec., Steam)			N/A				
26	Attached piping			Seller provides 2" and larger as prefabricated spools; smaller than 2" as random lengths. All within				
27				Top 10' of tip exit shall be stainless steel.				
28	Utilities Available (Design / Normal)							
29	Steam Pressure	psi (g)		N/A				
30	Steam Temperature	°F		N/A				
31	Location of Steam Conditions			N/A				
32	Blower Power, (Volts / Phase / Freq)			460V / 3 phase/ 60 Hz				
33	Instr. Power, (Volts / Phase / Freq)			120 / 1phase/ 60 Hz				
34	Electrical Classification, (Cl / Gp / Div)			Class I / Div 2 / Group C and D				1
35	Instrument Air	psi (g)		135 max, 60-100 normal				
36	Plant Air	psi (g)		135 max, 60-100 normal				
37	Nitrogen	psi (g)		N/A				
38	Fuel Gas, (psi (g) / Case #) (City gas)		28	See fuel gas composition, page 9				B
39	Purge Gas, (psi (g) / Case #) (City gas)		28	See fuel gas composition, page 9				B
40	Utility Costs			N/A				
41				N/A				
42								
43	Nearby Structures (Dist, Height)	ft		300 ft radius area is clear				B
44	Other Active Flares			Maintenance flare				B
45	Direction from Current Flare			NW				B
46	Heat Release	Btu/h		TBD				
47	Radiant Fraction			N/A				
48	Other Inactive Flares			N/A				
49	Cooling Towers			N/A				
50	Electrical Substations			N/A				
51	Property Line			N/A				
52								
53								
54								
55								
56								
64								
65								
66								
67								
68								

TAG NO.	FL-1241	FLARE API 537	DATASHEET NO. 30917-40-15-07-210-001	REV 2	SHT 3	OF 12

PROCESS DESIGN CONDITIONS - PURCHASER

		Note	Alternate 0: Propane	Rev	Alternate 1: Butane	Rev	Alternate 2: Propane	Rev
Design Flare Capacity	lb/h		279,000		280,000		350,227	2
Smokeless Capacity (lb/h / opacity)			28,000/ Ringelmann 1		28,000/ Ringelmann 1		28,000/ Ringelmann 1	2
Gas Temperature	°F		73		38		84	2
Static Pressure at Flare Inlet	psi (g)		5		5		8	2
Flare Inlet Diameter	Inch	30	24	0	24	0	24	2
Heat Release (LHV)	MM Btu/h		5,562		5,506	B	6,984	2
Duration @ Max. Rate	min		30		30		30	2
Relief Source			Depropanizer		Debutanizer		Depropanizer	2
Controlling Case For . . .			By vendor		By vendor		By vendor	2
GAS COMPOSITION (Mole%)								
Nitrogen			0.00%		0.00%		0.00%	2
CO2			0.00%		0.00%		0.00%	2
Methane			0.00%		0.00%		0.00%	2
Ethane			6.54%		0.00%		0.49%	2
Propane			91.90%		3.04%		97.99%	2
i-butane			1.31%		31.17%		1.37%	2
n-butane			0.25%		64.48%		0.15%	2
i-pentane			0.00%		1.18%		0.00%	2
n-pentane			0.00%		0.13%		0.00%	2
22-Mbutane			0.00%		0.00%		0.00%	2
2-Mpentane			0.00%		0.00%		0.00%	2
3-Mpentane			0.00%		0.00%		0.00%	2
n-hexane			0.00%		0.00%		0.00%	2
n-heptane			0.00%		0.00%		0.00%	2
n-Octane			0.00%		0.00%		0.00%	2
n-Nonane			0.00%		0.00%		0.00%	2
H20			0.00%		0.00%		0.00%	2
TOTAL (should be 100%)			100.00%		100.00%		100.00%	2
Molecular Weight			43.3		57.7		44.2	2
Lower Heating Value	Btu/lb		19,970		19,660		19,941	2
Ratio of Specific Heats	Cp/Cv		N/A		N/A		N/A	2
Viscosity	cP		N/A		N/A		N/A	2
Dew Point @ static inlet press.	°F		N/A		N/A		N/A	2
UEL	% in air		N/A		N/A		N/A	2
LEL	% in air		N/A		N/A		N/A	2

TAG NO.	FL-1241	FLARE API 537	DATASHEET NO. 30917-40-15-07-210-001	REV 2	SHT 4	OF 12

PROCESS DESIGN CONDITIONS - PURCHASER

			Note	Actual Seller Design	0
Design Flare Capacity		lb/h		350,227	2
Smokeless Capacity (lb/h / opacity)				28000/ Ringelmann 1	0
Gas Temperature		°F		84	2
Static Pressure at Flare Inlet		psi (g)		8.0	2
Flare Inlet Diameter		inch	30	24	0
Heat Release (LHV)		MM Btu/h		6,984	2
Duration @ Max. Rate		min		30	2
Relief Source				Depropanizer	2
Controlling Case For . . .				By vendor	2
GAS COMPOSITION (Mole%)					
Nitrogen				0.00%	2
CO2				0.00%	2
Methane				0.00%	2
Ethane				0.49%	2
Propane				97.99%	2
i-butane				1.37%	2
n-butane				0.15%	2
i-pentane				0.00%	2
n-pentane				0.00%	2
22-Mbutane				0.00%	2
2-Mpentane				0.00%	2
3-Mpentane				0.00%	2
n-hexane				0.00%	2
n-heptane				0.00%	2
n-Octane				0.00%	2
n-Nonane				0.00%	2
H20				0.00%	2
TOTAL (should be 100%)				100.00%	2
Molecular Weight				44.2	2
Lower Heating Value		Btu/lb		19,941	2
Ratio of Specific Heats		Cp/Cv		N/A	2
Viscosity		cP		N/A	2
Dew Point @ static inlet press.		°F		N/A	2
UEL		% in air		N/A	2
LEL		% in air		N/A	2

	TAG NO.	FL-1241	FLARE API 537	DATASHEET NO.	REV	SHT	OF
				30917-40-15-07-210-001	2	5	12

	REQUIRED SYSTEM PERFORMANCE - PURCHASER						
			Note	Specified	REV	Based on Case / Flow	REV
	FLOW PERFORMANCE						
	Hydraulic Capacity	lb/h		Up to full flow conditions for each specified case			
	Static Inlet Pressure	psi (g)		8 (allowable)	2		
	Peak Exit Velocity	ft/s		By vendor		449 (Design Case)	0
	Peak Mach Number			0.75 (max)	0	0.60 (Design Case)	0
	RADIATION PERFORMANCE						
	Peak Radiation at Grade	Btu/h-ft^2	31	1500 Btu/hr-ft2		All specified cases	B
	Distance to Peak Radiation	ft		By vendor			
	Distance to 500	Btu/h-ft^2, ft	31	280	B	All specified cases	B
	NOISE PERFORMANCE						
	SPL at Flare Base	dBA	4	85		Smokeless case	B
	SPL at ft from base	dBA		N/A			
	SPL at ft from base	dBA		N/A			
	SMOKELESS PERFORMANCE						
	Smokeless Capacity	lb/h		28,000		28,000	0
	Smokeless Definition (R0 / R1 / R2)			R1		R1	0
	SMOKELESS STEAM CONSUMPTION						
	Primary Steam	lb/h		N/A			
	Secondary Steam	lb/h		N/A			
	Tertiary Steam	lb/h		N/A			
	Max. Total Steam	lb/h		N/A			
	Continuous Steam	lb/h		N/A			
	S/HC ratio @ Design Smokeless Rate			N/A			
	SMOKELESS AIR REQUIREMENTS						
	Continuous (min.)	hp		By vendor		75	0
	Second Stage	hp		By vendor		N/A	0
	Third Stage	hp		By vendor		N/A	0
	Max. Total Power	hp		By vendor		75	0
	Design Air Capacity	SCFM		By vendor			
	Design Blower Pressure	in wc		By vendor			
	UTILITY CONSUMPTION						
	Purge Gas	SCFH		By vendor		870	0
	Pilot Gas	SCFH		By vendor		65 X 3	0
	Ignition Gas (Intermittent)	SCFH		By vendor		110	0
	Ignition Air (Intermittent)	SCFH		By vendor		1100	0
	Assist Gas	(SCFH) / (lb/h waste)		By vendor			
	Supplemental Gas	SCFH		By vendor			

TAG NO.	FL-1241	FLARE API 537	DATASHEET NO. 30917-40-15-07-210-001	REV 2	SHT 6	OF 12

MECHANICAL DESIGN DATA (FLARE BURNER)		Note	Purchaser - Specified	REV	Vendor - Proposed / Actual	REV
FLARE BURNER BODY						
Tip, (Type / Model)			By vendor		AFTA - 24/56	0
Quantity of Burners			By vendor		1	0
Smokeless Method			By vendor		Air Assist	0
Overall Length	ft		By vendor		10	0
Upper Section Length	ft		By vendor		5	0
Material / Diam. / Thickness	inch	9	310SS / By vendor / By vendor	0	310 SS / 24 / TBD	0
Lower Section Length	ft		By vendor		5	0
Material / Diam. / Thickness	inch		By vendor		SA 516 Gr. 60 / 24	0
Connection, (Type / Size)	inch		By vendor	0	BW / TBD	0
Lining Length	ft		By vendor		N/A	0
Material / Thickness	inch		By vendor		N/A	0
Muffler, (Length / Diameter)	ft/inch		By vendor			
Windshield, (Type / Material)			By vendor			
Flame Retention, (Y/N / Material)			By vendor		Y / 310 SS	0
Lifting lugs (on tip)			By vendor			
STEAM ASSIST EQUIPMENT			N/A			
Primary Steam Material						
Connection (Type / Size)	inch					
Secondary Steam Material						
Connection (Type / Size)	inch					
Tertiary Steam Material						
Connection (Type / Size)	inch					
AIR ASSIST EQUIPMENT						
Air Plenum Length	ft		By vendor		160	0
Air Plenum Diameter	inch		By vendor		54	0
Connection Type / Size	inch		By vendor		Plate Flg/ 54"(bottom), 56" (top)	0
PILOTS						
Quantity			2 minimum	B	3	0
Rating - Each	Btu/h		By vendor		65000	0
Gas Pressure	psig		By vendor		15	0
Inspirator Type			By vendor			
Inspirator Material			By vendor			
Gas Orifice Size	inch		By vendor			
Strainer (Y/N)			By vendor			
Flame Monitors (per pilot / per flare)			By vendor		1/3	0
Flame Monitor Type			By vendor		Thermocouple	0
Pilot Fuel Connection (Type/Size)	inch		By vendor		FNPT / 3/4"	0
Fuel Gas Manifold (Y/N)			By vendor		Y	0
Manifold Connection (Type/Size)	inch		By vendor		FNPT / 3/4"	0
Ignition Connection (Type/Size)	inch		flanged at base	0	BW / 1"	0
Retractable Pilots (Y/N)			N			
Retractable Thermocouples (Y/N)			Y		Y	0
IGNITION SYSTEM						
Type (FFG / Electronic / Other)		15	FFG	0		
Distance from Stack	ft		400 (at KO drum)	0		
Automatic / Manual Ignition		21	Manual with automatic relight	B		
Electrical Classification (Cl / Gp / Div)			Class I / Group C & D / Div 2	0	Class I / Group C & D / Div 2	0
Remote Alarm Contacts - Quantity			By vendor			
Remote Ignition Contact (Y/N)			Y			
Pressure Regulators - Quantity			By vendor		2	0
Pressure Gauges - Quantity			By vendor		3	0
Pilot Selector Valves - Type / Quantity			By vendor		/3	1
Pilot Indicator Lights (Y/N)			Y		3	0
Piping connections			flanged at tip and base			

TAG NO.	FL-1241	FLARE API 537	DATASHEET NO.	REV	SHT	OF
			30917-40-15-07-210-001	2	7	12

	MECHANICAL DESIGN DATA (PURGE DEVICE / STACK)					
		Note	Purchaser - Specified	REV	Vendor - Proposed / Actual	REV
	PURGE CONSERVATION DEVICE					
	Type, (Buoyancy / Velocity / None)		Velocity		Velocity	0
	Outside Diameter inch		By vendor			
	Overall Length ft		By vendor			
	Material / Thickness		By vendor			
	Inlet, (Type / Size) inch		By vendor			
	Outlet, (Type / Size) inch		By vendor			
	Drain, (Type / Size) inch		N/A			
	Loop Seal Depth (ref 23251) inch		N/A			
	STACK					
	Overall Height ft		199		190	0
	Support Method		By vendor	0	Self-Supporting	0
	Design Pressure psi (g)			0	10 (riser), 2 (air plenum)	0
	Design Temperature °F	9	-50 to 550		-50 to 550	0
	Riser Material		Low temperature carbon steel	0	SA-516 Gr 60	0
	Upper Section Length ft		By vendor			
	Material / Diam. / Thickness inch		By vendor			
	Middle Section Length ft		By vendor			
	Material / Diam. / Thickness inch		By vendor			
	Lower Section Length ft		By vendor			
	Material / Diam. / Thickness inch		By vendor			
	Inlet, (Type / Size) inch		By vendor			
	Drain, (Type / Size) inch		By vendor			
	Derrick, Base (Shape / Size) ft		N/A			
	Guy Wire Dead Man Radius ft		N/A			
	Corrosion allowance in		1/16" min (carbon steel), 0" (SS)	1		
	Deflection in/100ft		By vendor			
	PIPING ON STACK					
	Pilot Gas Lines - Quantity		One per pilot		One with manifold at tip	0
	Material / Size, inch / Schedule		By vendor		SA-106 Gr. B/ 1" / 40	0
	Ignition Lines - Quantity		By vendor		3	0
	Material / Size, inch / Schedule		SS/By vendor/By vendor		304 SS/ 1" / 40	0
	Primary Steam - (Mat'l / Size, inch / Sched)		N/A			
	Secondary Steam - (Mat'l / Size, inch / Sched)		N/A			
	Tertiary Steam - (Mat'l / Size, inch / Sched)		N/A			
	Drain Line - (Mat'l / Size, inch / Sched)		None			
	Assist Gas Line - (Mat'l / Size, inch / Sched)		N/A			
	T/C Conduit - (Mat'l / Size, inch)		By vendor		316L / 1/2"	0
	Ignition / Power Conduit - (Mat'l / Size, inch)		By vendor		N/A	0
	ACWL Power Conduit - (Mat'l / Size, inch)		By vendor			
	Manway Access		By vendor		24" opening	1
	Skirt Access and Venting		Provide (2) 20" access openings at the bottom of the flare stack for external inspection of the flare riser.		24" opening and 2-4" vent holes	1

	TAG NO.	FL-1241	FLARE API 537	DATASHEET NO.	REV	SHT	OF
				30917-40-15-07-210-001	2	8	12

	MECHANICAL DESIGN DATA (ANCILLARIES)					
		Note	Purchaser - Specified	REV	Vendor - Proposed / Actual	REV
	AIR ASSIST BLOWER SYSTEM		By vendor			
	Fan Quantity		By vendor	0	one installed, see note 37	1
	Fan, (Type / Material)		By vendor		Vane Axial / TBD	0
	Fan Location		Grade	B	In ductwork	0
	Damper Quantity		By vendor			
	Damper Control (Required / Included)		By vendor			
	Motor, (Type / Speed)		By vendor			
	Motor Enclosure		By vendor		TEAO	0
	Motor Nameplate HP		By vendor		75	0
	Motor / Fan - Lubrication		By vendor			
	Max. Motor Current - Winter Amp		By vendor			
	Supplemental Requirements		By vendor		Inlet Bell & Bird Screen	0
	LADDERS & PLATFORMS				N/A	0
	Top Platform, (Deg. / Size, ft)			0		
	Step-off Platforms Quantity			0		
	Buoyancy Seal Access			0		
	Instrument Access Quantity			0		
	Ladders Type			0		
	Material / Finish			0		
	L&P Specification			0		
	AIRCRAFT WARNING SYSTEM		N/A (if height < 200 ft)	B	N/A	0
	Quantity					
	Location					
	Color / Type, (Strobe / Beacon / Paint)					
	Retractable					
	Painting Specification					
	EST. EQUIPMENT WEIGHTS, (lb)	10				
	Flare Tip		By vendor		4000 lb	0
	Purge Reduction Device		By vendor			
	Gas/Air Risers + Piping		By vendor			
	Support System		By vendor			
	Ladders & Platforms		By vendor			
	Liquid Seal		By vendor			
	Knockout Drum		N/A			
	Control Panels		By vendor			
	SMOKE SUPPRESSION CONTROL					
	Flare Gas Flow Detector		Optional	B	Not included	0
	Smoke Detector		Optional	B	Not included	0
	Control Strategy, (Auto / Manual)		Manual	B		
	CODES					
	API 521, Pressure Relieving & Depressuring Syst.		Yes			
	API 537, Flare Details		Yes			
	STS-1, Steel Stacks		Yes			
	ASME BPVC, Section II, Material		Yes			
	ASME BPVC, Section V, Inspection		Yes			
	ASME BPVC, Section IX, Welding		Yes			
	ASME B31.3 Piping		Yes			
	AWS D1.1 Structural Welding		Yes			
	IBC 2009/ ASCE 7-05		Yes			
	API 661, Pressure Relieving & Depressuring Syst.					B
	SCOPE OF SUPPLY					
	Required		Flare Burner, Pilot, Pilot Igniters,			
			Pilot Flame Detectors, Velocity Seal, Piping,			
			Wind Shields, Support Structure,			
			Heat Shields, Testing and Inspection,			
				0		B
	Optional		Smoke Suppression Control,			
			Air Assist (as required), Ladders and			
			Platforms			

KOHLER. POWER SYSTEMS

PSI 2013 Stationary 60 Hz Emergency Stand-by[1]" Certified Power Generation Rating Data													
Generator Model	Engine	Speed	Freq	Fuel	Duty Cycle	Flywheel power [2,3]		Engine Family	C02	THC+NOx	CO	bsfc[5]	Catalyst
		RPM	Hz			HP	kW		(g/KW-hr)	(g/KW-hr)	(g/kW-hr)	(g/kW-hr)	
25REZG	3.0L	1800	60	LP	Emergency	49.2	36.7	DPSIB2.972ED	888.49	9.93	32.66	265	No
	3.0L	1800	60	NG	Emergency	49.2	36.7	DPSIB2.972ED	805.49	7.22	29.47	255.9	No

[1] Standby and overload ratings based on ISO3046. Continuous ratings based on ISO 8528.

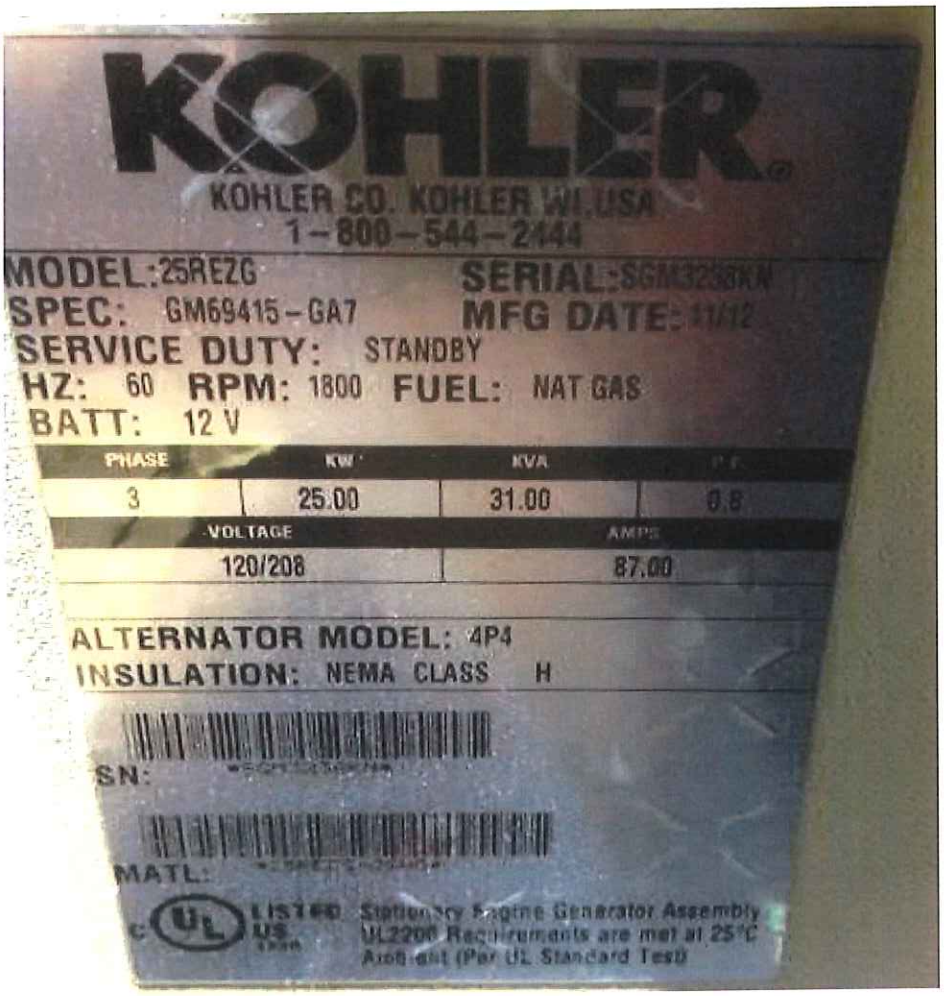
[2] All ratings are gross flywheel horsepower corrected to 77°F at an altitude of 328 feet with no cooling fan or alternator losses using heating value for NG of 1015 BTU/SCF.

[3] Production tolerances in engines and installed components can account for power variations of +/- 5%. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

[4] Electrical ratings are an estimated based on assumed fan and generator losses and may vary depending on actual equipment losses.

[5] Bsfc is based on 100% gross flywheel power rating and does not include fan or generator losses.

For additional questions contact:
Power Solutions, Inc.
655 Wheat Lane – Wood Dale, IL 60191
630.350.9400 (M) – 630.350.9900 (F)
www.psiengines.com info@psiengines.com



From: Turchin, John
Sent: Thursday, August 14, 2014 3:48 PM
To: Zawaski, Danell
Cc: Durham, Shanda; Thompson, Bill; Detling, Jeremie; Hineri
Subject: RE: backup power for Moundsville frac

Danell,
Attached is the name plate data for the 25 kw generator we would like to set at the Moundsville Frac.
Let us know if there anything else we can help with.
Thanks,

John Turchin
Cell: (985) 258-6124 | Work: (304) 843-3118 | Fax: (304) 232-6703
100 Teletech Drive Suite 2, Moundsville, WV 26041

Williams

Model: 25REZG

KOHLER. Power Systems

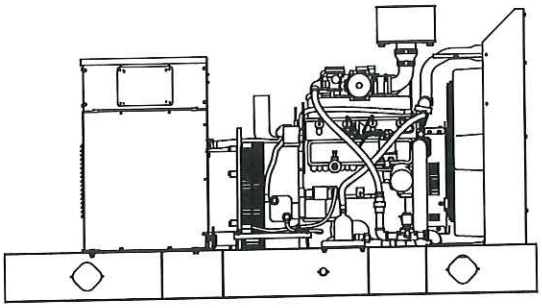
190–600 V **Gas**

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED

EPA-Certified for Stationary Emergency Applications

Ratings Range

		60 Hz	50 Hz
Standby:	**kW**	24–25	18–20
	kVA	24–31	19–25



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- A one-year limited warranty covers all systems and components. Two- and five-year extended warranties are also available.
- Alternator features:
  - The unique Fast-Response™ II excitation system delivers excellent voltage response and short-circuit capability using a permanent magnet (PM)-excited alternator.
  - The brushless, rotating-field alternator has broadrange reconnectability.
- Other features:
  - Kohler designed controllers for guaranteed system integration and remote communication. See Controllers on page 3.
  - The electronic, isochronous governor incorporates an integrated drive-by-wire throttle body actuator delivering precise frequency regulation.

Generator Set Ratings

Alternator	Voltage	Ph	Hz	Natural Gas 130°C Rise Standby Rating kW/kVA	Amps	LP Gas 130°C Rise Standby Rating kW/kVA	Amps
4P4	120/208	3	60	25/31	87	25/31	87
	127/220	3	60	25/31	82	25/31	82
	120/240	3	60	25/31	75	25/31	75
	120/240	1	60	24/24	100	24/24	100
	139/240	3	60	25/31	75	25/31	75
	220/380	3	60	25/31	47	25/31	47
	277/480	3	60	25/31	38	25/31	38
	347/600	3	60	25/31	30	25/31	30
	110/190	3	50	20/25	76	20/25	76
	115/200	3	50	20/25	72	20/25	72
	120/208	3	50	18/23	62	18/23	62
	110/220	1	50	19/19	86	19/19	86
	110/220	3	50	20/25	66	20/25	66
	220/380	3	50	20/25	38	20/25	38
	230/400	3	50	20/25	36	20/25	36
	240/416	3	50	18/23	31	18/23	31
4Q4	120/240	1	60	25/25	104	25/25	104
	110/220	1	50	20/20	91	20/20	91

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. *Standby Ratings:* The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. *Prime Power Ratings:* At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528-1 and ISO-3046-1. For limited running time and continuous ratings, consult the factory. Obtain technical information bulletin (TIB-101) for ratings guidelines, complete ratings definitions, and site condition derates. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. For dual fuel engines, use the natural gas ratings for both the primary and secondary fuels.

Alternator Specifications

Specifications	Alternator
Manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet
Leads: quantity, type	
4P4	12, Reconnectable
4Q4	4, 110–120/220–240
Voltage regulator	Solid State, Volts/Hz
Insulation:	NEMA MG1
Material	Class H
Temperature rise	130°C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load	Controller Dependent
One-step load acceptance	100% of Rating
Unbalanced load capability	100% of Rated Standby Current
Peak motor starting kVA:	(35% dip for voltages below)
480 V, 380 V 4P4 (12 lead)	121 (60 Hz), 88 (50 Hz)
240 V, 220 V 4Q4 (4 lead)	62 (60 Hz), 62 (50 Hz)

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Vacuum-impregnated windings with fungus-resistant epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- Fast-Response™ II brushless alternator with brushless exciter for excellent load response.

Application Data

Engine

Engine Specifications	60 Hz	50 Hz
Manufacturer	General Motors	
Engine: model, type	Industrial Powertrain 3.0 L, 4-Cycle Natural Aspiration	
Cylinder arrangement	4 Inline	
Displacement, L (cu. in.)	3.0 (181)	
Bore and stroke, mm (in.)	101.6 x 91.4 (4.00 x 3.60)	
Compression ratio	8.2:1	
Piston speed, m/min. (ft./min.)	329 (1080)	274 (900)
Main bearings: quantity, type	2 Bolt	
Rated rpm	1800	1500
Max. power at rated rpm, kW (HP)	33 (44)	27.5 (37)
Engine power at standby rating, kW (HP)	33 (44)	27.5 (37)
Cylinder head material	Cast Iron	
Piston type and material	High Silicon Aluminum	
Crankshaft material	Nodular Iron	
Governor type	Electronic	
Frequency regulation, no-load to full-load	Isochronous	
Frequency regulation, steady state	±0.5%	
Frequency	Fixed	
Air cleaner type, all models	Dry	

Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust manifold type	Dry	
Exhaust flow at rated kW, m^3/min. (cfm)	7.1 (250)	5.9 (208)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	688 (1270)	
Maximum allowable back pressure, kPa (in. Hg)	10.2 (3.0)	
Exhaust outlet size at engine hookup, mm (in.)	64 (2.5) OD	

Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Ignition system	Electronic, Distributor	
Battery charging alternator:		
Ground (negative/positive)	Negative	
Volts (DC)	12	
Ampere rating	70	
Starter motor rated voltage (DC)	12	
Battery, recommended cold cranking amps (CCA):		
Qty., rating for -18°C (0°F)	1, 630	
Battery voltage (DC)	12	

Fuel

Fuel System	60 Hz	50 Hz
Fuel type	Natural Gas, LP Gas, or Dual Fuel	
Fuel supply line inlet	1 NPTF	
Natural gas fuel supply pressure, kPa (in. H_2O)	1.74–2.74 (7-11)	
LPG vapor withdrawal fuel supply pressure, kPa (in. H_2O)	1.24–2.74 (5-11)	
Dual fuel engine, LPG vapor withdrawal fuel supply pressure, kPa (in. H_2O)	1.24 (5)	

Fuel Composition Limits *	Nat. Gas	LP Gas
Methane, % by volume	90 min.	—
Ethane, % by volume	4.0 max.	—
Propane, % by volume	1.0 max.	85 min.
Propene, % by volume	0.1 max.	5.0 max.
C_4 and higher, % by volume	0.3 max.	2.5 max.
Sulfur, ppm mass	25 max.	
Lower heating value, MJ/m^3 (Btu/ft^3), min.	33.2 (890)	84.2 (2260)

* Fuels with other compositions may be acceptable. If your fuel is outside the listed specifications, contact your local distributor for further analysis and advice.

Application Data

Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, L (qt.)	3.8 (4.0)	
Oil pan capacity with filter, L (qt.)	4.1 (4.3)	
Oil filter: quantity, type	1, Cartridge	

Cooling

Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F) *	50 (122)	
Engine jacket water capacity, L (gal.)	6.8 (1.8)	
Radiator system capacity, including engine, L (gal.)	14.9 (3.9)	
Engine jacket water flow, Lpm (gpm)	42 (11)	35 (9)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	34.1 (1940)	28.4 (1617)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	533 (21)	
Fan, kWm (HP)	1.5 (2.0)	1.0 (1.2)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H_2O)	0.125 (0.5)	

* Enclosure with enclosed silencer reduces ambient temperature capability by 5°C (9°F).

Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m^3/min. (scfm) †	142 (5000)	113 (4000)
Combustion air, m^3/min. (cfm)	2.1 (74)	1.75 (62)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	9.2 (522)	15.4 (860)
Alternator, kW (Btu/min.)	4.5 (259)	3.75 (216)

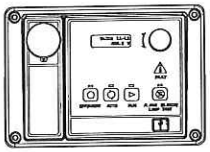
† Air density = 1.20 kg/m^3 (0.075 lbm/ft^3)

Fuel Consumption ‡	60 Hz	50 Hz
Natural Gas, m^3/hr. (cfh) at % load	**Standby Ratings**	
100%	10.5 (366)	8.8 (305)
75%	8.5 (297)	7.1 (248)
50%	5.5 (194)	4.6 (162)
25%	3.3 (115)	2.8 (96)
LP Gas, m^3/hr. (cfh) at % load	**Standby Ratings**	
100%	4.5 (156)	3.8 (130)
75%	3.6 (127)	3.0 (106)
50%	2.4 (83)	2.0 (69)
25%	1.4 (50)	1.2 (42)

‡ Nominal fuel rating: Natural gas, 37 MJ/m^3 (1000 Btu/$ft.^3$)
LP vapor, 93 MJ/m^3 (2500 Btu/$ft.^3$)

LP vapor conversion factors:
8.58 $ft.^3$ = 1 lb.
0.535 m^3 = 1 kg.
36.39 $ft.^3$ = 1 gal.

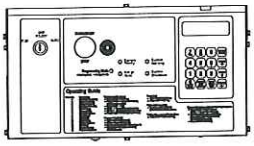
Controllers



Decision-Maker® 3000 Controller
Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.

- Digital display and menu control provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or serial configuration
- Controller supports Modbus® protocol
- Integrated hybrid voltage regulator with ±0.5% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-100 for additional controller features and accessories.



Decision-Maker® 550 Controller
Provides advanced control, system monitoring, and system diagnostics with remote monitoring capabilities.

- Digital display and keypad provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or modem configuration
- Controller supports Modbus® protocol
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-46 for additional controller features and accessories.

KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales and service outlet in the
US and Canada, phone 1-800-544-2444
KOHLERPower.com

Kohler Power Systems
Asia Pacific Headquarters
7 Jurong Pier Road
Singapore 619159
Phone (65) 6264-6422, Fax (65) 6264-6455

Standard Features

- Alternator Protection
- Battery Rack and Cables
- Electronic, Isochronous Governor
- Gas Fuel System (includes fuel mixer, electronic secondary gas regulator, gas solenoid valve, and flexible fuel line between the engine and the skid-mounted fuel system components)
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature

Available Options

Approvals and Listings

- ❑ CSA Approval
- ❑ IBC Seismic Certification
- ❑ UL 2200 Listing

Enclosed Unit

- ❑ Sound Enclosure (with enclosed critical silencer)
- ❑ Weather Enclosure (with enclosed critical silencer)

Open Unit

- ❑ Exhaust Silencer, Critical (kit: PA-352663)
- ❑ Flexible Exhaust Connector, Stainless Steel

Fuel System

- ❑ Dual Fuel NG/LPG (automatic changeover)
- ❑ Flexible Fuel Line
  (required when the generator set skid is spring mounted)
- ❑ Gas Filter
- ❑ LP Liquid Wtihdrawal (vaporizer)
- ❑ Secondary Gas Solenoid Valve

Controller

- ❑ Common Fault Relay
- ❑ Communication Products and PC Software
  (Decision-Maker® 550 controller only)
- ❑ Customer Connection
  (Decision-Maker® 550 controller only)
- ❑ Dry Contact (isolated alarm)
  (Decision-Maker® 550 controller only)
- ❑ Input/Output Module
  (Decision-Maker® 3000 controller only)
- ❑ Remote Annunciator Panel
- ❑ Remote Audiovisual Alarm Panel
  (Decision-Maker® 550 controller only)
- ❑ Remote Emergency Stop
- ❑ Run Relay

Cooling System

- ❑ Block Heater, 1000 W, 110-120 V
  Recommended for ambient temperatures below 10°C (50°F)
- ❑ Radiator Duct Flange

Electrical System

- ❑ Alternator Strip Heater
- ❑ Battery
- ❑ Battery Charger, Equalize/Float Type
- ❑ Battery Heater
- ❑ Line Circuit Breaker (NEMA1 enclosure)
- ❑ Line Circuit Breaker with Shunt Trip (NEMA1 enclosure)

Miscellaneous

- ❑ Air Cleaner Restrictor Indicator
- ❑ Certified Test Report
- ❑ Engine Fluids (oil and coolant) Added
- ❑ Rated Power Factor Testing
- ❑ Rodent Guards

Literature

- ❑ General Maintenance
- ❑ NFPA 110
- ❑ Overhaul
- ❑ Production

Warranty

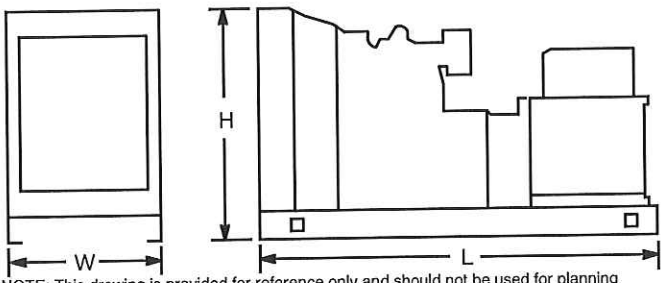
- ❑ 2-Year Basic
- ❑ 5-Year Basic
- ❑ 5-Year Comprehensive

Other Options

- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____

Dimensions and Weights

Overall Size, L x W x H, mm (in.):	
Wide Skid	2200 x 1040 x 1172 (86.6 x 40.9 x 46.1)
Narrow Skid	2200 x 864 x 1172 (86.6 x 34.0 x 46.1)
Weight (radiator model), wet, kg (lb.):	639 (1409)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

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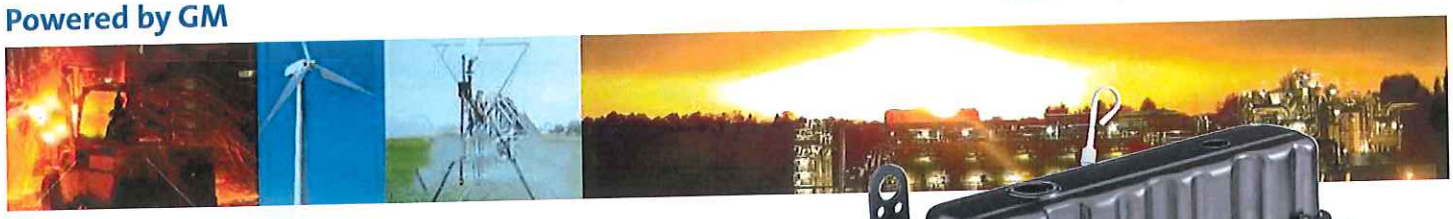

Vortec 3.0L I-4

Industrial

A proven history of performance and durability

Typical Industrial Engine Shown
(Fuel Rail and Injectors sold separately)

MPFI Capable Version (LMX):

- Multi-port electronic fuel injection (MPFI) version for gasoline or dual fuel applications
- Cylinder head targets fuel injectors to back of intake valves for quick response to changing conditions
- Stainless steel MPFI fuel rail resists corrosion

Gaseous Version (LW6):

- Customized for gaseous fuels only, taking advantage of the higher octane levels by using a higher compression ratio

All Versions:

- Utilizes 58X crankshaft position sensing via either a VR Crankshaft Position Sensor or a Digital Crankshaft Position Sensor (at OEM choice). Digital Crankshaft Position Sensor enables use of and is compatible with GMPT MEFI Control System. All engines equipped with a HVS (High Voltage Switch) and coil iginition system.
- Sintered powder metal exhaust valve seat inserts for enhanced durability
- Nodular iron crankshaft for increased strength and durability
- Designed to use gasoline, propane, and natural gas
- Aluminum heads with premium valve seat inserts and hard faced exhaust valves for extended life on gaseous fuels
- 58X crank-triggered, waste spark ignition system utilizes the coil pack, crankshaft position sensor and available ECM for accurate OEM-defined spark timing which cannot be altered by end user
- Aluminum PFI-style intake manifold can be used for gaseous fuels (LPG or Natural Gas) or can be up-fitted with the optional gasoline fuel system (shipped without throttle body unit)
- Dual takedown cast iron exhaust manifold with heat shield reduces radiated heat to nearby components
- Engine has a badge area on top where OEMs can place their own identifying badge
- 1.4kW starter for faster starts at any temperature
- Thermostat with internal bleed for improved cooling system performance Industrial Engine

Available Options

- An electronic control module (ECM) for optimizing fuel and spark requirements is available in kit form (gasoline only).
- Available in low and high compression ratio.

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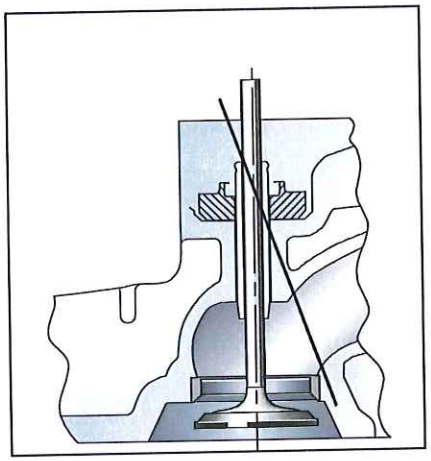
Vortec 3.0L I-4

Feature Focus

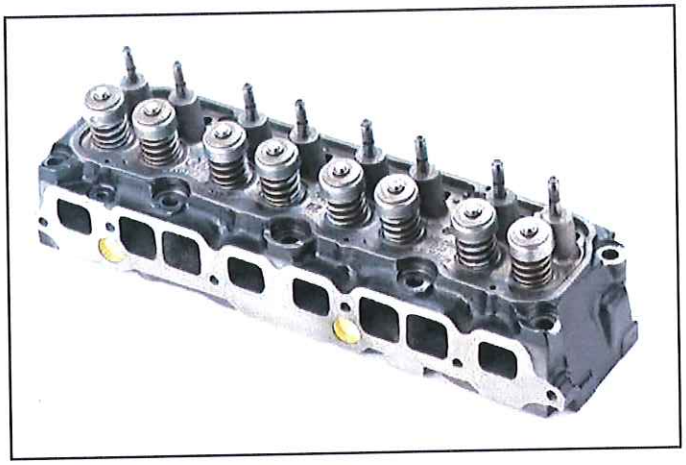
The Vortec 3.0L engine, with the longest history of any industrial engine offered by GM Powertrain, has a well-earned reputation for durability and reliability.

The Vortec 3.0L is currently used exclusively in marine and industrial applications. Whether on the water or on the job, the Vortec 3.0L delivers the durable power you need.

All GM industrial engines are Vortec engines. Vortec means uncompromised power — outstanding power with no sacrifice in fuel efficiency or durability and very little required maintenance.



The exhaust valve seat inserts in the cylinder head provide superb durability.



The 8-port version cylinder head casting is used on all versions of the Vortec 3.0L engine. Certain versions of this common casting are machined to accept the MPFI Fuel Injection System.

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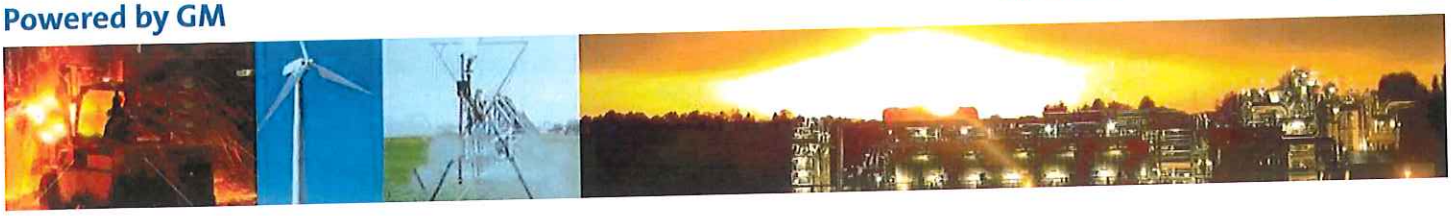


Vortec 3.0L I-4

Specifications

Vortec 3.0L Specification Focus

Type: 3.0L I4
Displacement: 181 cid (2966.59 cc)
Engine Orientation: Longitudinal
Compression Ratio: 10.5:1 (LW6), 9.2:1 (LMX, High CR)
8.3:1 (LMX, Low CR)
Valve Configuration: Pushrod Actuated Overhead Valves (2 valves per cylinder)
Assembly Site: Toluca, Mexico
Valve Lifters: Hydraulic Flat Tappet
Firing Order: 1 - 3 - 4 - 2
Bore x Stroke: 101.60 x 91.44 mm
Bore Center: 112.26 mm
Bore Area: 324.29 cm²
Fuel System: MPFI Capable (LMX)
N/A (LW6)
Fuel Type: LMX: Gasoline (MPFI Capable)
LW6: Propane, Natural Gas

Horsepower:
94 hp (70 kW) @ 3200 rpm (MPFI: Gasoline (LMX)) Low CR
93 hp (69 kW) @ 3.0L rpm (MPFI: Gasoline (LMX)) High CR
73 hp (54 kW) @ 2200 rpm (Natural Gas: (LW6))
64 hp (48 kW) @ 1800 rpm (Propane: (LW6))

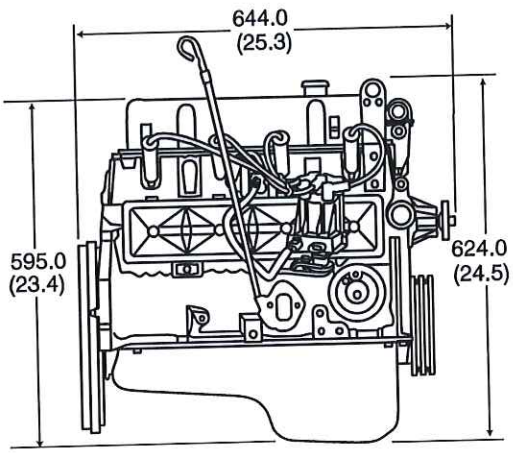
Torque:
188 lb-ft (255 Nm) @ 1800 rpm (Propane: (LW6))
178 lb-ft (241 Nm) @ 1600 rpm (Nat. Gas: (LW6))
172 lb-ft (233 Nm) @ 1800 rpm (MPFI: Gasoline (LMX)) High CR
168 lb-ft (228 Nm) @ 2300 rpm (MPFI: Gasoline (LMX)) Low CR

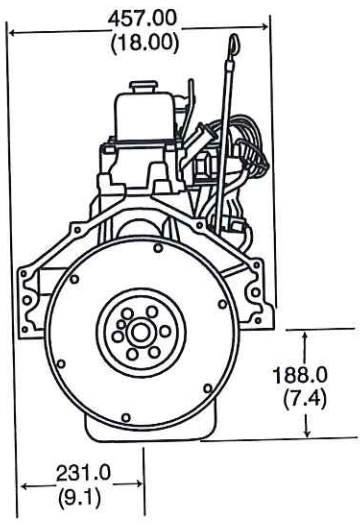
Actual power levels may vary depending on OEM calibration and application.

Fuel Shutoff: OEM defined
Shipping Weight: 363 lb (165 kg)

Materials:
Block: Cast Iron
Cylinder Head: Cast Iron with exhaust valve seat inserts
Intake Manifold: Customer Supplied
Exhaust Manifold: Customer Supplied
Main Bearing Caps: 2 -Bolt Cast Iron
Crankshaft: Nodular Cast Iron
Camshaft: Indus. Profile Low Speed, High Torque (8-port)
Connecting Rods: Powdered Metal

Information may vary with application. All specifications listed are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.





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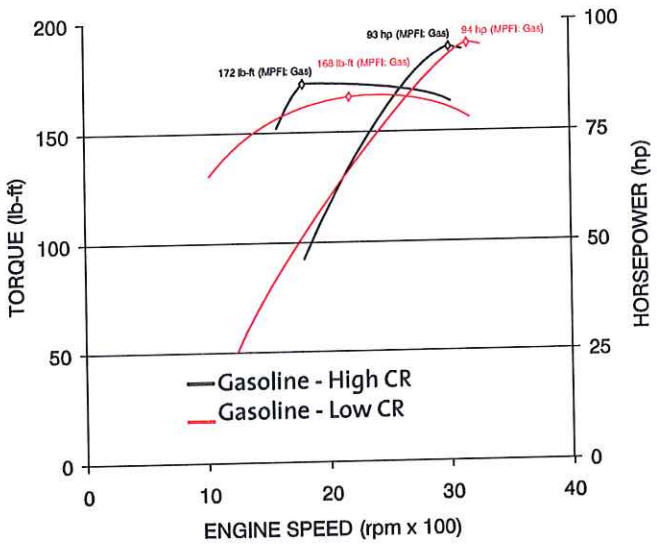
Vortec 3.0L I-4

Specifications

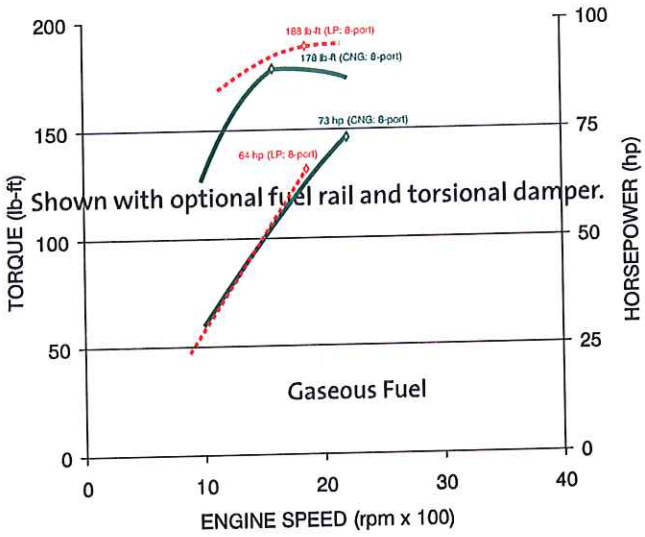
- **Vortec 3.0L Specification Focus**

2006 Vortec 3000 3.0L I-4 (LW6)



Actual power levels may vary depending on OEM calibration and application.

2006 Vortec 3000 3.0L I-4 (LW6)



Actual power levels may vary depending on OEM calibration and application.

Supplement 07
Storage Tank Data Sheet
(Insignificant Emission Units)

General Form – 4.24.19: Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NOx, SO2, VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year (5 tpy) aggregate total for each criteria pollutant from all emission units.

General Form – 4.24.20: Emission units which do not have any applicable requirements and which emit hazardous air pollutants (HAP) into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year (0.5 tpy) aggregate total for all HAPs from all emission sources.

Please specify all emission units for which this exemption applies along with the quantity of pollutants emitted on an hourly and annual basis.

Williams Ohio Valley Midstream LLC

Moundsville Fractionation Plant

Application for Title V Permit (45CSR30) Renewal

Supplement S07

Storage Tank Data Sheet
(Insignificant Emission Units)

Unit ID	Emission ID	Contents	Orient-ation	Capacity (gal)	Thru-Put (gal/yr)	VOC		HAP	
						lb/hr	tpy	lb/hr	tpy
3S	TKS	Stabilized Condensate Pressure Vessel	Horiz	3 @ 90,000	No Emissions Except Fugitives (FUG (1S)) and Blowdown/Purge Losses to Flare (FL-02 (5S))				
3S	TKS	NGL Accumulation Pressure Vessel	Horiz	6 @ 61,400					
				6 @ 90,000					
3S	TKS	Propane Accumulation Pressure Vessel	Horiz	5 @ 90,000					
			Sphere	2 @ 420,000					
3S	TKS	Butane Accumulation Pressure Vessel	Horiz	2 @ 114,000					
			Sphere	3 @ 210,000					
3S	TKS	Natural Gasoline Accumulation Pressure Vessels	Horiz	2 @ 60,000					
				1 @ 90,000					
				2 @ 140,000					
V-2950	5E	Natural Gasoline Storage Tanks (Butane Blanket)	Vert-Dome	2 @ 454,000	No Emissions Except Fugitives (FUG (1S)) and Tank Losses to Flare (FL-02 (5S))				
V-2951									
3S	TKS	Slop Liquids Storage Tanks	Vert	2 @ 8,240	6,240	0.01	0.05	3E-03	0.01
		Diesel Storage Tank	Horiz	1 @ 520	6,240	4E-03	0.02	9E-04	4E-03
		Gasoline Storage Tank	Horiz	1 @ 520	6,240	0.07	0.32	0.02	0.08
		Methanol Storage Tank	Horiz	1 @ 300	3,600	3E-03	0.01	3E-03	0.01
3S	TKS	Mercaptan - Truck Loading Pressure Vessel	Horiz	2 @ 1,000	No Emissions Except Fugitives (FUG (1S))				
		Mercaptan - Rail Loading Pressure Vessel		1 @ 3,000					
				1 @ 3,000					
					TOTAL:	**0.09**	**0.40**	**0.03**	**0.11**
					THRESHOLD:	**1.00**	**5.00**	**0.10**	**0.50**

***** End of Application for Title V Permit (45CSR30) Renewal ****