Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Pre-Draft Permit; Appalachia Midstream, LLC; Application No. R30-05100130-2024

Steeber, Jeff <Jeff.Steeber@williams.com> Thu, Oct 17, 2024 at 12:23 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Sarah,

After further review of the Miller TVOP application, I do agree with what WVDEP is saying about the truck loadout emissions. Specifically, for produced water, the fluid is assumed to contain 10% VOC by weight so 0.18 TPY VOC from produced water truck loading is correct – totaling to 13.52 TPY. Apologies for that.

We will attempt to handle question 1 and 3 during the Title V-only revision application.

Thank you,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Thursday, October 17, 2024 8:38 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>

[Quoted text hidden]

[Quoted text hidden]

Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Pre-Draft Permit; Appalachia Midstream, LLC; Application No. R30-05100130-2024

Barron, Sarah K <sarah.k.barron@wv.gov> Thu, Oct 17, 2024 at 8:38 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Jeff,

1) The emission unit/point IDs of the two engines should be kept consistent between the Title V permit and the NSR permit in order to avoid confusion. It would be better to leave the IDs of the engines as EUCE-2a/EPCE-2a and EUCE-4a/EPCE-4a in this initial Title V permit.

2) Looking back at the emission calculations in the applications for this initial Title V permit and for R13-2831F (in which the current emission limits were set for the truck loadout), it appears that the truck loadout's VOC emissions limit of 13.52 tpy was based on:

- For Stabilized Condensate - Truck Loadout, VOC emissions were assumed to be 100% of the total off-gas (VOC PTE of 13.34 tpy)
- But for Produced Water - Truck Loadout, VOC emissions were assumed to be only 10% of the total off-gas (VOC PTE of 0.18 tpy)

If these calculations are incorrect, then an application for a NSR permit revision will need to be submitted to correct the emission limits. As the VOC limit in Condition 10.1.2. of the Title V pre-draft was taken from Condition 9.1.2. of R13-2831G, the emission limit cannot be changed without a revision of the NSR permit being completed.

3) Due to my deadline for the initial Title permit, I am unable to include the NSR permit's Class I Administrative Update (R13-2831H) for the changes to the flare's emission limits. After both of the permits have been issued, you will be able to submit a Title V only revision application to include the revisions made with R13-2831H in the Title V permit. The information for Title V permit revisions and the application for a Title V only revision can be found at the following website: Title V Guidance and Forms (wv.gov).

I am hoping that the permit will be able to go out for the public and EPA comment periods sometime next week. Please let me know if you have any further comments or questions as soon as practicable.

Thanks,
- Sarah

West Virginia Secretary of State — Online Data Services

Business and Licensing

Online Data Services Help

Business Organization Detail

NOTICE: The West Virginia Secretary of State's Office makes every reasonable effort to ensure the accuracy of information. However, we make no representation or warranty as to the correctness or completeness of the information. If information is missing from this page, it is not in the The West Virginia Secretary of State's database.

APPALACHIA MIDSTREAM SERVICES, L.L.C.

Organization Information

Org Type	Effective Date	Established Date	Filing Date	Charter	Class	Sec Type	Termination Date	Termination Reason
LLC | Limited Liability Company	3/9/2009		3/9/2009	Foreign	Profit			

Organization Information

Business Purpose	2212 - Utilities - Utilities - Natural Gas Distribution	**Capital Stock**	
Charter County		**Control Number**	99DMI
Charter State	OK	**Excess Acres**	
At Will Term	A	**Member Managed**	MGR
At Will Term Years		**Par Value**	
Authorized Shares		**Young Entrepreneur**	Not Specified

Addresses

Type	Address
Designated Office Address	ONE WILLIAMS CENTER, MD 47 TULSA, OK, 74172
Mailing Address	ONE WILLIAMS CENTER-MD-47 TULSA, OK, 74172 USA
Notice of Process Address	C T CORPORATION SYSTEM 5098 WASHINGTON ST W STE 407 CHARLESTON, WV, 253131561
Principal Office Address	ONE WILLIAMS CENTER-MD-47 TULSA, OK, 74172 USA
Type	**Address**

Officers

Type	Name/Address
Manager	LARRY C. LARSEN ONE WILLIAMS CENTER-MD-47 TULSA, OK, 74172
Type	**Name/Address**

Annual Reports

Filed For
2024
2023
2022
2021
2020
2019
2018
2017
2016
2015
2014
2013

2012
2011
2010
Date filed

For more information, please contact the Secretary of State's Office at 304-558-8000.

Thursday, October 17, 2024 — 10:05 AM

UC Defaulted Accounts Search Results

Sorry, no records matching your criteria were found.

FEIN:
Business name: APPALACHIA MIDSTREAM SERVICES, L.L.C.
Doing business as/Trading as:

Please use your browsers back button to try again.

WorkforceWV	Unemployment Compensation	Offices of the Insurance Commissioner

Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Pre-Draft Permit; Appalachia Midstream, LLC; Application No. R30-05100130-2024

Steeber, Jeff <Jeff.Steeber@williams.com> Wed, Oct 16, 2024 at 1:07 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

See Comments Below:

1. I believe the emission IDs for the Waukesha L7044 GSI engines should be EUCE-2/EPCE-2 and EUCE-4/EPCE-4, not EUCE-2a/EPCE-2a and EUCE-4a/EPCE-4a. No need to keep the “a” designation anymore as the existing 2/4 has been replaced. – Is this change able to be made?
2. I’m showing the total truck loadout emissions to be 15.12 TPY, not 13.52 TPY as is shown in Condition 10.1.2. – It is assumed that 100% of Total Off-Gas from the Truck Load-Out – PW will be VOC at 1.78 TPY – Not 0.18 TPY.

WVDAQ will incorporate the changes submitted via Class I Administrative Update on 9/10/2024 to the R13/Title VOP after the Title V Initial Issuance Correct?

From: Barron, SarahK <sarah.k.barron@wv.gov>
Sent: Monday, October 7, 2024 4:05 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: [EXTERNAL] Title V Pre-Draft Permit; Appalachia Midstream, LLC; Application No. R30-05100130-2024

[Quoted text hidden]

Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Pre-Draft Permit; Appalachia Midstream, LLC; Application No. R30-05100130-2024

Barron, Sarah K <sarah.k.barron@wv.gov> Mon, Oct 7, 2024 at 4:05 PM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Jeff,

Attached are the Miller Compressor Station's pre-draft permit and fact sheet for you to review.

Due to my deadline to issue this permit, the revisions associated with the R13-2831H application have not been included in the initial Title V permit and will need to be incorporated through a permit revision after the initial Title V permit has been issued.

Please let me know if you have any questions or comments about either document as soon as practicable but preferably no later than October 16, 2024.

Thank you,
- Sarah

--
Sarah Barron
Engineer Trainee
West Virginia Department of Environmental Protection
Division of Air Quality
(304) 414-1915
sarah.k.barron@wv.gov

2 attachments

DPFactSheet R30-05100130-2024.pdf
469K

DPPermit R30-05100130-2024.pdf
775K

West Virginia Department of Environmental Protection

Harold D. Ward
Cabinet Secretary

Permit to Operate

Pursuant to

Title V

of the Clean Air Act

Issued to:

Appalachia Midstream Services, L.L.C.
Miller Compressor Station
R30-05100130-2024

Laura M. Crowder
Director, Division of Air Quality

Issued: [Date of issuance] • *Effective: [Equals issue date plus two weeks]*
Expiration: [5 years after issuance date] • *Renewal Application Due: [6 months prior to expiration]*

Permit Number: **R30-05100130-2024**
Permittee: **Appalachia Midstream Services, L.L.C.**
Facility Name: **Miller Compressor Station**
Permittee Mailing Address: **100 Teletech Drive, Suite 2, Moundsville, WV 26041**

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45CSR30 C Requirements for Operating Permits. The permittee identified at the above-referenced facility is authorized to operate the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Facility Location:	Bannen, Marshall County, West Virginia
Facility Mailing Address:	100 Teletech Drive, Suite 2, Moundsville, WV 26041
Telephone Number:	(304) 843-3125
Type of Business Entity:	L.L.C.
Facility Description:	The Miller Compressor Station receives low-pressure "wet" natural gas from local production wells via pipeline. The gas is compressed and dehydrated for delivery of high pressure "dry" natural gas via pipeline. Raw condensate and produced fluid/water are also stabilized at the facility before being sent off-site via tanker trucks.
SIC Codes:	1389
UTM Coordinates:	532.49 km Easting • 4,396.919 km Northing • Zone 17

Permit Writer: Sarah Barron

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§ 22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §22-5-14.

Issuance of this Title V Operating Permit does not supersede or invalidate any existing permits under 45CSR13, 14 or 19, although all applicable requirements from such permits governing the facility's operation and compliance have been incorporated into the Title V Operating Permit.

Table of Contents

1.0 Emission Units and Active R13, R14, and R19 Permits

1.1. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
EUCE-2a	EPCE-2a	Compressor Engine 02a – Waukesha L7044 GSI	2023	1,900 HP	NSCR
EUCE-3	EPCE-3	Compressor Engine 03 – Waukesha L5794 GSI	2010	1,380 HP	NSCR
EUCE-4a	EPCE-4a	Compressor Engine 04a – Waukesha L7044 GSI	2023	1,900 HP	NSCR
EUCE-5	EPCE-5	Compressor Engine 05 – Waukesha L5794 GSI	2010	1,380 HP	NSCR
EUCE-6	EPCE-6	Compressor Engine 06 – Waukesha L5794 GSI	2010	1,380 HP	NSCR
EUCE-7	EPCE-7	Compressor Engine 07 – CAT G3516B	2012	1,380 HP	OxCat
EUCE-8	EPCE-8	Compressor Engine 08 – CAT G3516B	2012	1,380 HP	OxCat
EUCE-12	EPCE-12	Compressor Engine 12 – CAT G3516B	2017	1,380 HP	OxCat
EUCE-13	EPCE-13	Compressor Engine 13 – CAT G3516B	2017	1,380 HP	OxCat
EUCE-14	EPCE-14	Compressor Engine 14 – CAT G3516B	2017	1,380 HP	OxCat
EUCE-15	EPCE-15	Compressor Engine 15 – CAT G3516B	2017	1,380 HP	OxCat
EUBD	EPBD	Compressor Blowdown/Emergency Shutdown Tests	2010	574 events/yr	None
EUCRP	EPCRP	Compressor Rod Packing	2010	11 compressors	None
EUESU	EPESU	Engine Start-up	2010	11 engines	None
EUECC	EPECC	Engine Crankcase Emissions	2010	11 engines	None
EUGEN-1	EPGEN-1	Capstone C600 Microturbine Generator	2010	805 HP	None
EUDSV-1	EPDSV-1	Dehydrator 01 – Still Vent	2010	55 mmscfd	Cond/Recycle
EUDFT-1	EPDFT-1	Dehydrator 01 – Flash Tank			FLR/Recycle
EUDSV-2	EPDSV-2	Dehydrator 02 – Still Vent	2010	55 mmscfd	Cond/Recycle
EUDFT-2	EPDFT-2	Dehydrator 02 – Flash Tank			FLR/Recycle
EUDSV-3	EPDSV-3	Dehydrator 03 – Still Vent	2010	55 mmscfd	Cond/Recycle
EUDFT-3	EPDFT-3	Dehydrator 03 – Flash Tank			FLR/Recycle
EURBL-1	EPRBL-1	Reboiler 01	2010	1.0 mmBTU/hr	None
EURBL-2	EPRBL-2	Reboiler 02	2010	1.0 mmBTU/hr	None
EURBL-3	EPRBL-3	Reboiler 03	2010	1.0 mmBTU/hr	None

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
EUSTAB	EPSTAB	Condensate Stabilizer – Bypass to Flare	2010	120 hr/yr	FLR
EUOH-1	EPOH-1	Hot Oil Heater – Condensate Stabilizer	2010	3.35 mmBTU/hr	None
EUTK-1 to -12	EPTK-1 to -10	Storage Tanks 1 to 10 (Stabilized Condensate)	2010	400 bbl (each)	VRU
	EPWTK-11 to -12	Storage Tanks 11 to 12 (Produced Fluid/Water)			
EULOR	EPLOR	Stabilized Condensate Truck Loadout (LOR)	2010	273,750 bbl/yr of Stabilized Condensate	Carbon Canisters
		Produced Fluid/Water Truck Loadout (WLOR)		36,500 bbl/yr of Produced Fluid/Water	
EUPIG	EPPIG	Pigging Operations	2010	624 events/yr	None
APCFLARE	APCFLARE	Dehydrator/Stabilizer Flare	2010	5.0 mmBTU/hr	N/A
EUFUG	EPFUG	Piping and Equipment Leaks (Gas/Vapor)	2010	7,472 units	LDAR
		Piping and Equipment Leaks (Light Liquid/Oil)		2,271 units	

1.2. Active R13, R14, and R19 Permits

The underlying authority for any conditions from R13, R14, and/or R19 permits contained in this operating permit is cited using the original permit number (e.g. R13-1234). The current applicable version of such permit(s) is listed below.

Permit Number	Date of Issuance
R13-2831G	January 16, 2024

2.0 General Conditions

2.1. Definitions

2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.

2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.

2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.39.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.1.4. Unless otherwise specified in a permit condition or underlying rule or regulation, all references to a "rolling yearly total" shall mean the sum of the monthly data, values or parameters being measured, monitored, or recorded, at any given time for the previous twelve (12) consecutive calendar months.

2.2. Acronyms

CAAA	Clean Air Act Amendments	**NSPS**	New Source Performance Standards
CBI	Confidential Business Information	**PM**	Particulate Matter
CEM	Continuous Emission Monitor	**PM_{10}**	Particulate Matter less than 10μm in diameter
CES	Certified Emission Statement	**pph**	Pounds per Hour
C.F.R. *or* CFR	Code of Federal Regulations	**ppm**	Parts per Million
CO	Carbon Monoxide	**PSD**	Prevention of Significant Deterioration
C.S.R. *or* CSR	Codes of State Rules	**psi**	Pounds per Square Inch
DAQ	Division of Air Quality	**SIC**	Standard Industrial Classification
DEP	Department of Environmental Protection	**SIP**	State Implementation Plan
FOIA	Freedom of Information Act	**SO_2**	Sulfur Dioxide
HAP	Hazardous Air Pollutant	**TAP**	Toxic Air Pollutant
HON	Hazardous Organic NESHAP	**TPY**	Tons per Year
HP	Horsepower	**TRS**	Total Reduced Sulfur
lbs/hr *or* lb/hr	Pounds per Hour	**TSP**	Total Suspended Particulate
LDAR	Leak Detection and Repair	**USEPA**	United States Environmental Protection Agency
m	Thousand	**UTM**	Universal Transverse Mercator
MACT	Maximum Achievable Control Technology	**VEE**	Visual Emissions Evaluation
mm	Million	**VOC**	Volatile Organic Compounds
mmBtu/hr	Million British Thermal Units per Hour		
$mmft^3$/hr *or* mmcf/hr	Million Cubic Feet Burned per Hour		
NA *or* N/A	Not Applicable		
NAAQS	National Ambient Air Quality Standards		
NESHAPS	National Emissions Standards for Hazardous Air Pollutants		
NO_x	Nitrogen Oxides		

2.3. Permit Expiration and Renewal

2.3.1. Permit duration. This permit is issued for a fixed term of five (5) years and shall expire on the date specified on the cover of this permit, except as provided in 45CSR§30-6.3.b. and 45CSR§30-6.3.c.
[45CSR§30-5.1.b.]

2.3.2. A permit renewal application is timely if it is submitted at least six (6) months prior to the date of permit expiration.
[45CSR§30-4.1.a.3.]

2.3.3. Permit expiration terminates the source's right to operate unless a timely and complete renewal application has been submitted consistent with 45CSR§30-6.2. and 45CSR§30-4.1.a.3.
[45CSR§30-6.3.b.]

2.3.4. If the Secretary fails to take final action to deny or approve a timely and complete permit application before the end of the term of the previous permit, the permit shall not expire until the renewal permit has been issued or denied, and any permit shield granted for the permit shall continue in effect during that time.
[45CSR§30-6.3.c.]

2.4. Permit Actions

2.4.1. This permit may be modified, revoked, reopened and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.
[45CSR§30-5.1.f.3.]

2.5. Reopening for Cause

2.5.1. This permit shall be reopened and revised under any of the following circumstances:

a. Additional applicable requirements under the Clean Air Act or the Secretary's legislative rules become applicable to a major source with a remaining permit term of three (3) or more years. Such a reopening shall be completed not later than eighteen (18) months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions has been extended pursuant to 45CSR§§30-6.6.a.1.A. or B.

b. Additional requirements (including excess emissions requirements) become applicable to an affected source under Title IV of the Clean Air Act (Acid Deposition Control) or other legislative rules of the Secretary. Upon approval by U.S. EPA, excess emissions offset plans shall be incorporated into the permit.

c. The Secretary or U.S. EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit.

d. The Secretary or U.S. EPA determines that the permit must be revised or revoked and reissued to assure compliance with the applicable requirements.

[45CSR§30-6.6.a.]

2.6. Administrative Permit Amendments

2.6.1. The permittee may request an administrative permit amendment as defined in and according to the procedures specified in 45CSR§30-6.4.
[45CSR§30-6.4.]

2.7. Minor Permit Modifications

2.7.1. The permittee may request a minor permit modification as defined in and according to the procedures specified in 45CSR§30-6.5.a.
[45CSR§30-6.5.a.]

2.8. Significant Permit Modification

2.8.1. The permittee may request a significant permit modification, in accordance with 45CSR§30-6.5.b., for permit modifications that do not qualify for minor permit modifications or as administrative amendments.
[45CSR§30-6.5.b.]

2.9. Emissions Trading

2.9.1. No permit revision shall be required, under any approved economic incentives, marketable permits, emissions trading, and other similar programs or processes for changes that are provided for in the permit and that are in accordance with all applicable requirements.
[45CSR§30-5.1.h.]

2.10. Off-Permit Changes

2.10.1. Except as provided below, a facility may make any change in its operations or emissions that is not addressed nor prohibited in its permit and which is not considered to be construction nor modification under any rule promulgated by the Secretary without obtaining an amendment or modification of its permit. Such changes shall be subject to the following requirements and restrictions:

a. The change must meet all applicable requirements and may not violate any existing permit term or condition.

b. The permittee must provide a written notice of the change to the Secretary and to U.S. EPA within two (2) business days following the date of the change. Such written notice shall describe each such change, including the date, any change in emissions, pollutants emitted, and any applicable requirement that would apply as a result of the change.

c. The change shall not qualify for the permit shield.

d. The permittee shall keep records describing all changes made at the source that result in emissions of regulated air pollutants, but not otherwise regulated under the permit, and the emissions resulting from those changes.

e. No permittee may make any change subject to any requirement under Title IV of the Clean Air Act (Acid Deposition Control) pursuant to the provisions of 45CSR§30-5.9.

f. No permittee may make any changes which would require preconstruction review under any provision of Title I of the Clean Air Act (including 45CSR14 and 45CSR19) pursuant to the provisions of 45CSR§30-5.9.

[45CSR§30-5.9.]

2.11. Operational Flexibility

2.11.1. The permittee may make changes within the facility as provided by § 502(b)(10) of the Clean Air Act. Such operational flexibility shall be provided in the permit in conformance with the permit application and applicable requirements. No such changes shall be a modification under any rule or any provision of Title I of the Clean Air Act (including 45CSR14 and 45CSR19) promulgated by the Secretary in accordance with Title I of the Clean Air Act and the change shall not result in a level of emissions exceeding the emissions allowable under the permit.
[45CSR§30-5.8]

2.11.2. Before making a change under 45CSR§30-5.8., the permittee shall provide advance written notice to the Secretary and to U.S. EPA, describing the change to be made, the date on which the change will occur, any changes in emissions, and any permit terms and conditions that are affected. The permittee shall thereafter maintain a copy of the notice with the permit, and the Secretary shall place a copy with the permit in the public file. The written notice shall be provided to the Secretary and U.S. EPA at least seven (7) days prior to the date that the change is to be made, except that this period may be shortened or eliminated as necessary for a change that must be implemented more quickly to address unanticipated conditions posing a significant health, safety, or environmental hazard. If less than seven (7) days notice is provided because of a need to respond more quickly to such unanticipated conditions, the permittee shall provide notice to the Secretary and U.S. EPA as soon as possible after learning of the need to make the change.
[45CSR§30-5.8.a.]

2.11.3. The permit shield shall not apply to changes made under 45CSR§30-5.8., except those provided for in 45CSR§30-5.8.d. However, the protection of the permit shield will continue to apply to operations and emissions that are not affected by the change, provided that the permittee complies with the terms and conditions of the permit applicable to such operations and emissions. The permit shield may be reinstated for emissions and operations affected by the change:

a. If subsequent changes cause the facility's operations and emissions to revert to those authorized in the permit and the permittee resumes compliance with the terms and conditions of the permit, or

b. If the permittee obtains final approval of a significant modification to the permit to incorporate the change in the permit.

[45CSR§30-5.8.c.]

2.11.4. "Section 502(b)(10) changes" are changes that contravene an express permit term. Such changes do not include changes that would violate applicable requirements or contravene enforceable permit terms and conditions that are monitoring (including test methods), recordkeeping, reporting, or compliance certification requirements.
[45CSR§30-2.40]

2.12. Reasonably Anticipated Operating Scenarios

2.12.1. The following are terms and conditions for reasonably anticipated operating scenarios identified in this permit.

a. Contemporaneously with making a change from one operating scenario to another, the permittee shall record in a log at the permitted facility a record of the scenario under which it is operating and to document the change in reports submitted pursuant to the terms of this permit and 45CSR30.

b. The permit shield shall extend to all terms and conditions under each such operating scenario; and

c. The terms and conditions of each such alternative scenario shall meet all applicable requirements and the requirements of 45CSR30.

[45CSR§30-5.1.i.]

2.13. Duty to Comply

2.13.1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.
[45CSR§30-5.1.f.1.]

2.14. Inspection and Entry

2.14.1. The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;

d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

[45CSR§30-5.3.b.]

2.15. Schedule of Compliance

2.15.1. For sources subject to a compliance schedule, certified progress reports shall be submitted consistent with the applicable schedule of compliance set forth in this permit and 45CSR§30-4.3.h., but at least every six (6) months, and no greater than once a month, and shall include the following:

a. Dates for achieving the activities, milestones, or compliance required in the schedule of compliance, and dates when such activities, milestones or compliance were achieved; and

b. An explanation of why any dates in the schedule of compliance were not or will not be met, and any preventative or corrective measure adopted.

[45CSR§30-5.3.d.]

2.16. Need to Halt or Reduce Activity not a Defense

2.16.1. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.
[45CSR§30-5.1.f.2.]

2.17. Reserved.

2.18. Federally-Enforceable Requirements

2.18.1. All terms and conditions in this permit, including any provisions designed to limit a source's potential to emit and excepting those provisions that are specifically designated in the permit as "State-enforceable only", are enforceable by the Secretary, USEPA, and citizens under the Clean Air Act.
[45CSR§30-5.2.a.]

2.18.2. Those provisions specifically designated in the permit as “State-enforceable only” shall become “Federally-enforceable” requirements upon SIP approval by the USEPA.

2.19. Duty to Provide Information

2.19.1. The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records required to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.
[45CSR§30-5.1.f.5.]

2.20. Duty to Supplement and Correct Information

2.20.1. Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.
[45CSR§30-4.2.]

2.21. Permit Shield

2.21.1. Compliance with the conditions of this permit shall be deemed compliance with any applicable requirements as of the date of permit issuance provided that such applicable requirements are included and are specifically identified in this permit or the Secretary has determined that other requirements specifically identified are not applicable to the source and this permit includes such a determination or a concise summary thereof.
[45CSR§30-5.6.a.]

2.21.2. Nothing in this permit shall alter or affect the following:

a. The liability of an owner or operator of a source for any violation of applicable requirements prior to or at the time of permit issuance; or

b. The applicable requirements of the Code of West Virginia and Title IV of the Clean Air Act (Acid Deposition Control), consistent with § 408 (a) of the Clean Air Act.

c. The authority of the Administrator of U.S. EPA to require information under § 114 of the Clean Air Act or to issue emergency orders under § 303 of the Clean Air Act.

[45CSR§30-5.6.c.]

2.22. Credible Evidence

2.22.1. Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defenses otherwise available to the permittee including but not limited to any challenge to the credible evidence rule in the context of any future proceeding.
[45CSR§30-5.3.e.3.B.]

2.23. Severability

2.23.1. The provisions of this permit are severable. If any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid by a court of competent jurisdiction, the remaining permit terms and conditions or their application to other circumstances shall remain in full force and effect.
[45CSR§30-5.1.e.]

2.24. Property Rights

2.24.1. This permit does not convey any property rights of any sort or any exclusive privilege.
[45CSR§30-5.1.f.4]

2.25. Acid Deposition Control

2.25.1. Emissions shall not exceed any allowances that the source lawfully holds under Title IV of the Clean Air Act (Acid Deposition Control) or rules of the Secretary promulgated thereunder.

a. No permit revision shall be required for increases in emissions that are authorized by allowances acquired pursuant to the acid deposition control program, provided that such increases do not require a permit revision under any other applicable requirement.

b. No limit shall be placed on the number of allowances held by the source. The source may not, however, use allowances as a defense to noncompliance with any other applicable requirement.

c. Any such allowance shall be accounted for according to the procedures established in rules promulgated under Title IV of the Clean Air Act.

[45CSR§30-5.1.d.]

2.25.2. Where applicable requirements of the Clean Air Act are more stringent than any applicable requirement of regulations promulgated under Title IV of the Clean Air Act (Acid Deposition Control), both provisions shall be incorporated into the permit and shall be enforceable by the Secretary and U. S. EPA.
[45CSR§30-5.1.a.2.]

3.0 Facility-Wide Requirements

3.1. Limitations and Standards

3.1.1. **Open burning.** The open burning of refuse by any person is prohibited except as noted in 45CSR§6-3.1. **[45CSR§6-3.1.]**

3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause or allow any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible. **[45CSR§6-3.2.]**

3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them. **[40 C.F.R. §61.145(b) and 45CSR34]**

3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. **[45CSR§4-3.1 State-Enforceable only.]**

3.1.5. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11. **[45CSR§11-5.2]**

3.1.6. **Emission inventory.** The permittee is responsible for submitting, on an annual basis, an emission inventory in accordance with the submittal requirements of the Division of Air Quality. **[W.Va. Code § 22-5-4(a)(15)]**

3.1.7. **Ozone-depleting substances.** For those facilities performing maintenance, service, repair or disposal of appliances, the permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 C.F.R. Part 82, Subpart F, except as provided for Motor Vehicle Air Conditioners (MVACs) in Subpart B:

a. Persons opening appliances for maintenance, service, repair, or disposal must comply with the prohibitions and required practices pursuant to 40 C.F.R. §§ 82.154 and 82.156.

b. Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to 40 C.F.R. § 82.158.

c. Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to 40 C.F.R. § 82.161.

[40 C.F.R. 82, Subpart F]

3.1.8. **Risk Management Plan.** Should this stationary source, as defined in 40 C.F.R. § 68.3, become subject to Part 68, then the owner or operator shall submit a risk management plan (RMP) by the date specified in 40 C.F.R. § 68.10 and shall certify compliance with the requirements of Part 68 as part of the annual compliance certification as required by 40 C.F.R. Part 70 or 71.
[40 C.F.R. 68]

3.1.9. **Minor Source of Hazardous Air Pollutants (HAP).** HAP emissions from the facility shall be less than 10 tpy of any single HAP or 25 tpy of any combination of HAPs. Compliance with this condition shall ensure that the facility is a minor HAP source.
[45CSR13, R13-2831, 4.1.2.]

3.1.10. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0. and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR13, R13-2831, 4.1.3. and 6.1.8.]

3.1.11. Only those emission units/sources as identified in Table 1.0., with the exception of any *de minimis* sources as identified under Table 45-13B of 45CSR13, are authorized at the permitted facility.
[45CSR13, R13-2831, 4.1.5.]

3.1.12. No person shall cause, suffer, allow or permit fugitive particulate matter to be discharged beyond the boundary lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution.
[45CSR§17-3.1.]

3.2. Monitoring Requirements

3.2.1. None.

3.3. Testing Requirements

3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63, if applicable, in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable.

b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit shall be revised in accordance with 45CSR§30-6.4. or 45CSR§30-6.5., as applicable.

c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.

d. The permittee shall submit a report of the results of the stack test within 60 days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:

1. The permit or rule evaluated, with the citation number and language.

2. The result of the test for each permit or rule condition.

3. A statement of compliance or non-compliance with each permit or rule condition.

[WV Code §§ 22-5-4(a)(15-16) and 45CSR13]

3.4. Recordkeeping Requirements

3.4.1. **Monitoring information.** The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit and time of sampling or measurements;

b. The date(s) analyses were performed;

c. The company or entity that performed the analyses;

d. The analytical techniques or methods used;

e. The results of the analyses; and

f. The operating conditions existing at the time of sampling or measurement.

[45CSR13, R13-2831, 4.1.1.; 45CSR§30-5.1.c.2.A.]

3.4.2. **Retention of records.** The permittee shall retain records of all required monitoring data and support information for a period of at least five (5) years from the date of monitoring sample, measurement, report, application, or record creation date. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Where appropriate, records may be maintained in computerized form in lieu of the above records.
[45CSR13, R13-2831, 3.4.1.; 45CSR§30-5.1.c.2.B.]

3.4.3. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§30-5.1.c. State-Enforceable only.]

3.4.4. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0., the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

a. The equipment involved.

b. Steps taken to minimize emissions during the event.

c. The duration of the event.

d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

e. The cause of the malfunction.

f. Steps taken to correct the malfunction.

g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

[45CSR13, R13-2831, 4.1.4.]

3.5. Reporting Requirements

3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.
[45CSR§§30-4.4. *and* 5.1.c.3.D.]

3.5.2. A permittee may request confidential treatment for the submission of reporting required under 45CSR§30-5.1.c.3. pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31. **[45CSR§30-5.1.c.3.E.]**

3.5.3. Except for the electronic submittal of the annual compliance certification and semi-annual monitoring reports to the DAQ and USEPA as required in 3.5.5 and 3.5.6 below, all notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class or by private carrier with postage prepaid to the address(es), or submitted in electronic format by e-mail as set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

DAQ:

Director
WVDEP
Division of Air Quality
601 57th Street SE
Charleston, WV 25304

US EPA:

Section Chief
U. S. Environmental Protection Agency, Region III
Enforcement and Compliance Assurance Division
Air, RCRA, and Toxics Branch (3ED21)
Four Penn Center
1600 John F. Kennedy Boulevard
Philadelphia, PA 19103-2852

DAQ Compliance and Enforcement[1]:
DEPAirQualityReports@wv.gov

[1]For all self-monitoring reports (MACT, GACT, NSPS, etc.), stack tests and protocols, Notice of Compliance Status reports, Initial Notifications, etc.

3.5.4. **Fees.** The permittee shall pay fees on an annual basis in accordance with 45CSR§30-8. **[45CSR§30-8.]**

3.5.5. **Compliance certification.** The permittee shall certify compliance with the conditions of this permit on the forms provided by the DAQ. In addition to the annual compliance certification, the permittee may be required to submit certifications more frequently under an applicable requirement of this permit. The annual certification shall be submitted to the DAQ and USEPA on or before March 15 of each year, and shall certify compliance for the period ending December 31. The permittee shall maintain a copy of the certification on site for five (5) years from submittal of the certification. The annual certification shall be submitted in electronic format by e-mail to the following addresses:

DAQ:
DEPAirQualityReports@wv.gov

US EPA:
R3_APD_Permits@epa.gov

[45CSR§30-5.3.e.]

3.5.6. **Semi-annual monitoring reports.** The permittee shall submit reports of any required monitoring on or before September 15 for the reporting period January 1 to June 30 and on or before March 15 for the reporting period July 1 to December 31. All instances of deviation from permit requirements must be clearly identified

in such reports. All required reports must be certified by a responsible official consistent with 45CSR§30-4.4. The semi-annual monitoring reports shall be submitted in electronic format by e-mail to the following address:

DAQ:
DEPAirQualityReports@wv.gov

[45CSR§30-5.1.c.3.A.]

3.5.7. **Reserved.**

3.5.8. **Deviations.**

a. In addition to monitoring reports required by this permit, the permittee shall promptly submit supplemental reports and notices in accordance with the following:

1. Reserved.

2. Any deviation that poses an imminent and substantial danger to public health, safety, or the environment shall be reported to the Secretary immediately by telephone or email. A written report of such deviation, which shall include the probable cause of such deviation, and any corrective actions or preventative measures taken, shall be submitted by the responsible official within ten (10) days of the deviation.

3. Deviations for which more frequent reporting is required under this permit shall be reported on the more frequent basis.

4. All reports of deviations shall identify the probable cause of the deviation and any corrective actions or preventative measures taken.

[45CSR§30-5.1.c.3.C.]

b. The permittee shall, in the reporting of deviations from permit requirements, including those attributable to upset conditions as defined in this permit, report the probable cause of such deviations and any corrective actions or preventive measures taken in accordance with any rules of the Secretary.
[45CSR§30-5.1.c.3.B.]

3.5.9. **New applicable requirements.** If any applicable requirement is promulgated during the term of this permit, the permittee will meet such requirements on a timely basis, or in accordance with a more detailed schedule if required by the applicable requirement.
[45CSR§30-4.3.h.1.B.]

3.6. Compliance Plan

3.6.1. None.

3.7. Permit Shield

3.7.1. The permittee is hereby granted a permit shield in accordance with 45CSR§30-5.6. The permit shield applies provided the permittee operates in accordance with the information contained within this permit.

3.7.2. The following requirements specifically identified are not applicable to the source based on the determinations set forth below. The permit shield shall apply to the following requirements provided the conditions of the determinations are met.

a. **45CSR21** – *Regulation to Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds* – This rule applies to sources located in Putnam County, Kanawha County, Cabell County, Wayne County, and Wood County. The facility is located in Marshall County, and, therefore, the rule is inapplicable.

b. **45CSR27** – *To Prevent and Control the Emissions of Toxic Air Pollutants* – This rule does not apply to the Miller Compressor Station because, per 45CSR§27-2.4., the equipment used in the production and distribution of petroleum products is not considered a chemical processing unit, provided that such equipment does not produce or contact materials containing more than 5% benzene by weight.

c. **40 C.F.R. Part 60 Subparts D, Da, Db, and Dc** – *Standards of Performance for Steam Generators* – As there are no steam generating units with a maximum design heat input equal to or greater than 10 mmBTU/hr operated at the facility, Subparts D, Da, Db, and Dc do not apply to the Miller Compressor Station per 40 C.F.R. §§60.40(a), 60.40Da(a), 60.40b(a), and 60.40c(a), respectively.

d. 4**0 C.F.R. Part 60 Subparts K, Ka, and Kb** – *Standards of Performance for Storage Vessels for Petroleum Liquids/Volatile Organic Liquids* – Subparts K and Ka do not apply to the Miller Compressor Station because construction of the storage vessels used at the facility began after the applicability dates of each subpart (Subpart K – after June 11, 1973 and prior to May 19, 1978; Subpart Ka – after May 18, 1978 and prior to July 23, 1984). Per 40 C.F.R. §60.110b(a), Subpart Kb does not apply to the facility because each volatile organic liquid storage vessel has a capacity less than 75 m^3 (471.73 bbl).

e. **40 C.F.R. Part 60 Subpart GG** – *Standards of Performance for Stationary Gas Turbines* – Per 40 C.F.R. §60.330(a), Subpart GG does not apply because no stationary gas turbines with a heat input at peak load equal to or greater than 10 mmBTU/hr, based on the lower heating value, are operated at the facility.

f. **40 C.F.R. Part 60 Subpart KKK** – *Standards of Performance for 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* – The Miller Compressor Station is not a natural gas processing plant as defined in 40 C.F.R. §60.631 and, therefore, is not subject to the provisions of Subpart KKK.

g. **40 C.F.R. Part 60 Subpart LLL** – *Standards of Performance for SO_2 Emissions from Onshore Natural Gas Processing for which Construction, Reconstruction, or Modification Commenced after January 20, 1984 and on or before August 23, 2011* – Per 40 C.F.R. §60.640(a), Subpart LLL does not apply because no sweetening units are operated at the compressor station.

h. **40 C.F.R. Part 60 Subpart IIII** – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines* – This subpart does not apply because only spark ignition internal combustion engines are operated at the Miller Compressor Station.

i. **40 C.F.R. Part 60 Subpart KKKK** – *Standards of Performance for Stationary Combustion Turbines* – Per 40 C.F.R. §60.4305(a), Subpart KKKK does not apply because no stationary combustion turbines with a heat input at peak load equal to or greater than 10 mmBTU/hr, based on the higher heating value of the fuel, are operated at the facility.

j. **40 C.F.R. Part 63 Subpart HHH** – *National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities* – The Miller Compressor Station is not a natural gas transmission and storage facility located prior to a local distribution company or to a final end user. Additionally, the facility is not a major source of HAP emissions. Therefore, per 40 C.F.R. §63.1270(a), the Miller Compressor Station is not subject to Subpart HHH.

k. **40 C.F.R. Part 63 Subpart YYYY** – *National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines* – Per 40 C.F.R. §63.6080, Subpart YYYY does not apply because the Miller Compressor Station is not a major source of hazardous air pollutants.

l. **40 C.F.R. Part 63 Subpart DDDDD** – *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters* – Per 40 C.F.R. §63.7485, Subpart DDDDD does not apply because the Miller Compressor Station is not a major source of hazardous air pollutants.

m. **40 C.F.R. Part 63 Subpart CCCCCC** – *National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities* – The Miller Compressor Station is not a gasoline dispensing facility (GDF) as defined in 40 C.F.R. §63.11132. Therefore, per 40 C.F.R. § 63.11111(a), the Miller Compressor Station is not subject to Subpart CCCCCC.

n. **40 C.F.R. Part 63 Subpart JJJJJJ** – *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources* – Per 40 C.F.R. §63.11195(e), gas-fired boilers are exempt from the standards of Subpart JJJJJJ. Therefore, the natural gas-fired reboilers (EURBL-1 through EURBL-3) operated at the Miller Compressor Station are not subject to Subpart JJJJJJ.

4.0 Compressor Engines and Microturbine [Emission Point IDs: EPCE-2a, EPCE-3, EPCE-4a, EPCE-5 to EPCE-8, & EPCE-12 to EPCE-15 and EPGEN-1]

4.1. Limitations and Standards

4.1.1. a. Maximum emissions from each of the 1,380 HP natural gas-fired reciprocating compressor engines equipped with NSCR, Waukesha L5794 GSI (EPCE-3, EPCE-5, EPCE-6), shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tpy)
Nitrogen Oxides	1.48	6.48
Carbon Monoxide	1.81	7.92
Volatile Organic Compounds (includes Formaldehyde)	0.17	0.76
Formaldehyde	0.02	0.10

b. Maximum emissions from each of the 1,900 HP natural gas-fired reciprocating compressor engines equipped with NSCR, Waukesha L7044 GSI (EPCE-2a, EPCE-4a), shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tpy)
Nitrogen Oxides	1.26	5.50
Carbon Monoxide	2.47	10.82
Volatile Organic Compounds (includes Formaldehyde)	0.20	0.85
Formaldehyde	0.05	0.22

c. Maximum emissions from each of the 1,380 HP natural gas-fired reciprocating compressor engines equipped with Oxidation Catalysts, CAT G3516B (EPCE-7, EPCE-8, EPCE-12, EPCE-13, EPCE-14, and EPCE-15), shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tpy)
Nitrogen Oxides	1.52	6.66
Carbon Monoxide	1.52	6.66
Volatile Organic Compounds (includes Formaldehyde)	1.19	5.20
Formaldehyde	0.31	1.38

[45CSR13, R13-2831, 5.1.1.]

4.1.2. Maximum emissions from the 805 HP natural gas-fired microturbine generator, Capstone C600 (EPGEN-1) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tpy)
Nitrogen Oxides	0.48	2.10
Carbon Monoxide	1.32	5.78
Volatile Organic Compounds (includes Formaldehyde)	0.14	0.61
Formaldehyde	0.02	0.09

[45CSR13, R13-2831, 5.1.2.]

4.1.3. The emission limitations specified in Conditions 4.1.1. and 4.1.2. shall apply at all times except during periods of start-up and shutdown provided that the duration of these periods does not exceed 30 minutes per occurrence. The permittee shall operate the engines in a manner consistent with good air pollution control practices for minimizing emissions at all times, including periods of start-up and shutdown. The emissions from start-up and shutdown shall be included in the twelve (12) month rolling total of emissions. The permittee shall comply with all applicable start-up and shutdown requirements in accordance with 40 C.F.R. Part 60 Subpart JJJJ and 40 C.F.R. Part 63 Subpart ZZZZ.
[45CSR13, R13-2831, 5.1.3.]

4.1.4. Maximum aggregate engine crankcase emissions from the engines (EPCE-2a, EPCE-3, EPCE-4a, EPCE-5 to EPCE-8, and EPCE-12 to EPCE-15) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tpy)
Nitrogen Oxides	0.04	0.20
Carbon Monoxide	0.24	1.07
Volatile Organic Compounds (includes Formaldehyde)	0.09	0.38
Formaldehyde	0.04	0.17

[45CSR13, R13-2831, 5.1.4.]

4.1.5. Requirements for Use of Catalytic Reduction Devices

a. Rich-burn natural gas-fired compressor engines (EPCE-2a, EPCE-3, EPCE-4a, EPCE-5, and EPCE-6) equipped with non-selective catalytic reduction (NSCR) air pollution control devices shall be fitted with a closed-loop, automatic air-to-fuel ratio controller to ensure emissions of regulated pollutants do not exceed the emission limit listed in Conditions 4.1.1.a. and 4.1.1.b. for any engine/NSCR combination under varying load. The closed-loop, automatic air-to-fuel ratio controller shall control a fuel metering valve to ensure a fuel-rich mixture and a resultant exhaust oxygen content of less than or equal to 2%.

b. Lean-burn natural gas engines (EPCE-7, EPCE-8, EPCE-12, EPCE-13, EPCE-14, and EPCE-15) equipped with oxidation catalyst air pollution control devices shall be fitted with a closed-loop automatic air-to-fuel ratio feedback controller to ensure emissions of regulated pollutants do not exceed the emission limit listed in Condition 4.1.1.c. for any engine/oxidation catalyst combination under varying load. The closed-loop, automatic air-to-fuel ratio controller shall control a fuel metering valve to ensure a lean-rich mixture.

c. No person shall knowingly:

1. Remove or render inoperative any air pollution or auxiliary air pollution control device installed subject to the requirements of this permit;

2. Install any part or component when the principal effect of the part or component is to bypass, defeat, or render inoperative any air pollution control device or auxiliary air pollution control device installed subject to the requirements of this permit; or

3. Cause or allow engine exhaust gases to bypass any catalytic reduction device.

d. The permittee shall monitor the temperature to the inlet of the catalyst and in accordance with manufacturer's specifications; a high temperature alarm shall shut off the engine before thermal deactivation of the catalyst occurs. If the engine shuts off due to high temperature, the permittee shall also check for thermal deactivation of the catalyst before normal operations are resumed.

e. The permittee shall follow a written operation and maintenance plan that provides the periodic and annual maintenance requirements.

[45CSR13, R13-2831, 5.1.5.]

4.1.6. The provisions of 40 C.F.R. Part 60 Subpart JJJJ are applicable to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) (EPCE-2a, EPCE-3, EPCE-4a, EPCE-5 to EPCE-8, and EPCE-12 to EPCE-15) as specified below. For the purposes of Subpart JJJJ, the date that construction commences is the date the engine is ordered by the permittee.

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

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

b. Owners and operators of stationary SI ICE that are modified or reconstructed after June 12, 2006.

[45CSR13, R13-2831, 11.1.1.; 45CSR16; 40 C.F.R. §§60.4230(a), (a)(4), (a)(4)(i), and (a)(5)]

4.1.7. The following emission standards from Table 1 to Subpart JJJJ of Part 60 apply to the compressor engines EPCE-2a, EPCE-3, EPCE-4a, EPCE-5 to EPCE-8, and EPCE-12 to EPCE-15:

Engine Type and Fuel	Maximum Engine Power	Manufacture Date	Emission Standards[1]					
			g/HP-hr			ppmvd at 15% O_2		
			NO_X	CO	VOC[2]	NO_X	CO	VOC[2]
Non-Emergency SI Natural Gas	HP≥500	7/1/2010	1.0	2.0	0.7	82	270	60

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

[2] For the purposes of Subpart JJJJ, when calculating emissions of volatile organic compounds, emissions of formaldehyde should not be included.

[45CSR13, R13-2831, 11.1.2.; 45CSR16; 40 C.F.R. §60.4233(e); Table 1 to Subpart JJJJ of Part 60]

4.1.8. The permittee shall operate and maintain the stationary SI ICEs (EPCE-2a, EPCE-3, EPCE-4a, EPCE-5 to EPCE-8, and EPCE-12 to EPCE-15) so that each engine achieves the emission standards as required in 40 C.F.R. §60.4233 over the entire life of the engine.
[45CSR13, R13-2831, 11.1.3.; 45CSR16; 40 C.F.R. §60.4234]

4.1.9. After July 1, 2009, the permittee may not install stationary SI ICE with a maximum engine power of greater than or equal to 500 HP that do not meet the applicable requirements in 40 C.F.R. §60.4233, except that lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP that do not meet the applicable requirements in §60.4233 may not be installed after January 1, 2010.
[45CSR13, R13-2831, 11.2.1.; 45CSR16; 40 C.F.R. §60.4236(b)]

4.1.10. The requirements of 40 C.F.R. §60.4236 do not apply to owners and operators of stationary SI ICE that have been modified or reconstructed, and they do not apply to engines that were removed from one existing location and reinstalled at a new location.
[45CSR13, R13-2831, 11.2.2.; 45CSR16; 40 C.F.R. §60.4236(e)]

4.1.11. Owners and operators of stationary SI natural gas-fired engines may operate their engines using propane for a maximum of 100 hours per year as an alternative fuel solely during emergency operations, but must keep records of such use. If propane is used for more than 100 hours per year in an engine that is not certified to the emission standards when using propane, the owners and operators are required to conduct a performance test to demonstrate compliance with the emission standards of 40 C.F.R. §60.4233.
[45CSR16; 40 C.F.R. §60.4243(e)]

4.1.12. It is expected that air-to-fuel ratio controllers will be used with the operation of three-way catalysts/non-selective catalytic reduction. The air-to-fuel ratio controller must be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times.
[45CSR16; 40 C.F.R. §60.4243(g)]

4.1.13. If a new or reconstructed stationary RICE located at an area source of HAP emissions is started up after January 18, 2008, the permittee must comply with the applicable emission limitations and operating limitations in 40 C.F.R. Part 63 Subpart ZZZZ upon startup of the affected source.
[45CSR13, R13-2831, 12.1.1.; 45CSR34; 40 C.F.R. §63.6595(a)(7)]

4.1.14. **Stationary RICE subject to Regulations under 40 C.F.R. Part 60.** An affected source that meets any of the criteria in 40 C.F.R. §§63.6590(c)(1) through (c)(7) must meet the requirements of 40 C.F.R. Part 63 Subpart ZZZZ by meeting the requirements of 40 C.F.R. Part 60 Subpart JJJJ for spark ignition engines. No further requirements apply for such engines under Subpart ZZZZ.

The permittee meets the criteria of paragraph (c)(1), which is for a new or reconstructed stationary RICE located at an area source. The permittee must meet the requirements of 40 C.F.R. Part 63 Subpart ZZZZ by meeting the requirements of 40 C.F.R. Part 60 Subpart JJJJ.

[45CSR13, R13-2831, 12.1.2.; 45CSR34; 40 C.F.R. §§63.6590(c) and (c)(1)]

4.1.15. Maximum aggregate rod packing emissions from the engines EPCE-2a, EPCE-3, EPCE-4a, EPCE-5 to EPCE-8, and EPCE-12 to EPCE-15 shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tpy)
Volatile Organic Compounds	4.98	21.81

[45CSR13, R13-2831, 13.1.1.]

4.2. Monitoring Requirements

4.2.1. Catalytic Oxidizer Control Devices

a. The permittee shall monitor the temperature to the inlet of the catalyst and in accordance with manufacturer's specifications; a high temperature alarm shall shut off the engine before thermal deactivation of the catalyst occurs. If the engine shuts off due to high temperature, the permittee shall check for thermal deactivation of the catalyst before normal operations are resumed.

b. The permittee shall regularly inspect, properly maintain and/or replace catalytic reduction devices and auxiliary air pollution control devices to ensure functional and effective operation of the engine's physical and operational design. The permittee shall ensure proper operation, maintenance and performance of catalytic reduction devices and auxiliary air pollution control devices by:

1. Maintaining proper operation of the automatic air-to-fuel ratio controller or automatic feedback controller.

2. Following operating and maintenance recommendations of the catalyst element manufacturer.

[45CSR13, R13-2831, 5.2.1.]

4.2.2. The permittee shall comply with the emission standards specified in 40 C.F.R. §60.4233(e). The permittee must demonstrate compliance according to the method specified below.

a. Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in §60.4233(e) and according to the requirements specified in §60.4244, as applicable, and according to paragraph a.1. of this condition.

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

[45CSR13, R13-2831, 11.3.1.; 45CSR16; 40 C.F.R. §§60.4243(b), (b)(2), and (b)(2)(ii)]

4.3. Testing Requirements

4.3.1. In order to demonstrate compliance with Conditions 4.1.1. and 4.2.2., the permittee shall conduct performance tests following the procedures in paragraphs (a) through (f) of this condition.

a. Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements in 40 C.F.R. §60.8 under the specific conditions that are specified by Table 2 to Subpart JJJJ of Part 60.

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

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

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

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

Where:
ER = Emission rate of NO_X in g/HP-hr
C_d = Measured NO_X concentration in parts per million by volume (ppmv)
1.912×10^{-3} = Conversion constant for ppm NO_X to grams per standard cubic meter at 20° Celsius
Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis
T = Time of test run, in hours
HP-hr = Brake work of the engine, in horsepower-hour (HP-hr)

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

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

Where:
ER = Emission rate of CO in g/HP-hr
C_d = Measured CO concentration in ppmv
1.164×10^{-3} = Conversion constant for ppm CO to grams per standard cubic meter at 20° Celsius
Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis
T = Time of test run, in hours
HP-hr = Brake work of the engine, in HP-hr

f. For the purposes of 40 C.F.R. Part 60 Subpart JJJJ, when calculating emissions of VOC, emissions of formaldehyde should not be included. To determine compliance with the VOC mass per unit output emission limitation, convert the concentration of VOC in the engine exhaust using Equation 3 of this condition:

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

Where:
ER = Emission rate of VOC in g/HP-hr
C_d = VOC concentration measured as propane in ppmv
1.833×10^{-3} = Conversion constant for ppm VOC measured as propane, to grams per standard cubic meter at 20° Celsius
Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis
T = Time of test run, in hours
HP-hr = Brake work of the engine, in HP-hr

g. If the permittee chooses to measure VOC emissions using either Method 18 of 40 C.F.R. Part 60, Appendix A or Method 320 of 40 C.F.R. Part 63, Appendix A, then the permittee has the option of correcting the measured VOC emissions to account for the potential differences in measured values between these methods and Method 25A. The results from Method 18 and Method 320 can be corrected for response factor differences using Equations 4 and 5 of this condition. The corrected VOC concentration can then be placed on a propane basis using Equation 6 of this condition.

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

Where:
RF_i = Response factor of compound i when measured with EPA Method 25A
C_{Mi} = Measured concentration of compound i in ppmv as carbon
C_{Ai} = True concentration of compound i in ppmv as carbon

$$C_{icorr} = RF_i \times C_{imeas} \quad \text{Eq. 5}$$

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

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

$$C_{Peq} = 0.6098 \times C_{icorr} \quad \text{Eq. 6}$$

Where:
C_{Peq} = Concentration of compound i in mg of propane equivalent per DSCM

[45CSR13, R13-2831, 5.3.1. and 11.4.1.; 45CSR16; 40 C.F.R. §60.4244]

4.4. Recordkeeping Requirements

4.4.1. To demonstrate compliance with Condition 4.1.5., the permittee shall maintain records of maintenance performed on each engine.
[45CSR13, R13-2831, 5.4.1.]

4.4.2. To demonstrate compliance with Condition 4.2.1., the permittee shall maintain records of all catalytic reduction device maintenance.
[45CSR13, R13-2831, 5.4.2.]

4.4.3. The permittee shall maintain a copy of the site-specific maintenance plan or manufacturer maintenance plan.
[45CSR13, R13-2831, 5.4.3.]

4.4.4. All records required by Conditions 4.4.1. through 4.4.3. shall be maintained in accordance with Condition 3.4.2. of this permit.
[45CSR13, R13-2831, 5.4.4.]

4.4.5. The permittee must keep records of the information in paragraphs a.1. through a.3. of this condition.

a. All notifications submitted to comply with 40 C.F.R. Part 60 Subpart JJJJ and all documentation supporting any notification.

b. Maintenance conducted on the engine.

c. If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to 40 C.F.R. §60.4243(a)(2), documentation that the engine meets the emission standards.

[45CSR13, R13-2831, 11.5.1.a.; 45CSR16; 40 C.F.R. §§60.4245(a), (a)(1), (a)(2), and (a)(4)]

4.5. Reporting Requirements

4.5.1. For SI ICE greater than or equal to 500 HP that have not been certified by an engine manufacturer to meet the emission standards in 40 C.F.R. §60.4231, the permittee must submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs a. through e. of this condition.

a. Name and address of the owner or operator;

b. The address of the affected source;

c. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

d. Emission control equipment; and

e. Fuel used.

[45CSR13, R13-2831, 11.5.1.c.; 45CSR16; 40 C.F.R. §60.4245(c)]

4.5.2. For each stationary SI ICE that is subject to performance testing, the permittee must submit a copy of each performance test as conducted in 40 C.F.R. §60.4244 within 60 days after the test has been completed. Performance test reports using EPA Method 18, EPA Method 320, or ASTM D6348-03 (incorporated by reference – see 40 C.F.R. §60.17) to measure VOC require reporting of all QA/QC data. For Method 18, report results from sections 8.4 and 11.1.1.4; for Method 320, report results from sections 8.6.2, 9.0, and 13.0; and for ASTM D6348-03 report results of all QA/QC procedures in Annexes 1-7.
[45CSR13, R13-2831, 11.5.1.d.; 45CSR16; 40 C.F.R. §60.4245(d)]

4.6. Compliance Plan

4.6.1. None.

5.0 40 C.F.R. Part 60 Subparts OOOO and OOOOa Requirements for the Reciprocating Compressors Associated with EUCE-2a, EUCE-4a, EUCE-7, EUCE-8, and EUCE-12 to EUCE-15

5.1. Limitations and Standards

5.1.1. At all times, including periods of startup, shutdown, and malfunction, the permittee shall maintain and operate any affected facility under 40 C.F.R. Part 60 Subpart OOOO or Subpart OOOOa, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. The provisions for exemption from compliance during periods of startup, shutdown, and malfunctions provided for in 40 C.F.R. §60.8(c) do not apply to Subpart OOOOa.
[45CSR16; 40 C.F.R. §60.5370(b); 40 C.F.R. §60.5370a(b)]

5.1.2. The permittee must comply with the standards in paragraphs a. through d. of this condition for the reciprocating compressor affected facilities EUCE-7 and EUCE-8.

a. The permittee must replace the reciprocating compressor rod packing according to either paragraph a.1. or 2. of this condition, or the permittee must comply with paragraph a.3. of this condition.

1. Before the compressor has operated for 26,000 hours. The number of hours of operation must be continuously monitored beginning upon initial startup of the reciprocating compressor affected facility or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.

2. Prior to 36 months from the date of the most recent rod packing replacement, or 36 months from the date of startup for a new reciprocating compressor for which the rod packing has not yet been replaced.

3. Collect the emissions from the rod packing using a rod packing emissions collection system which operates under negative pressure and route the rod packing emissions to a process through a closed vent system that meets the requirements of 40 C.F.R. §60.5411(a).

b. The permittee must demonstrate initial compliance with standards that apply to reciprocating compressor affected facilities as required by Condition 5.2.1.

c. The permittee must demonstrate continuous compliance with standards that apply to reciprocating compressor affected facilities as required by Condition 5.2.2.

d. The permittee must perform the required recordkeeping and reporting as required by Conditions 5.4.1. and 5.5.1., respectively.

[45CSR13, R13-2831, 13.1.2.; 45CSR16; 40 C.F.R. §60.5385]

5.1.3. The permittee must reduce GHG (in the form of a limitation on emissions of methane) and VOC emissions by complying with the standards in paragraphs a. through d. of this condition for the reciprocating compressor affected facilities EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15.

a. The permittee must replace the reciprocating compressor rod packing according to either paragraph a.1. or 2. of this condition, or the permittee must comply with paragraph a.3. of this condition.

1. On or before the compressor has operated for 26,000 hours. The number of hours of operation must be continuously monitored beginning upon initial startup of the reciprocating compressor affected facility or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.

2. Prior to 36 months from the date of the most recent rod packing replacement, or 36 months from the date of startup for a new reciprocating compressor for which the rod packing has not yet been replaced.

3. Collect the methane and VOC emissions from the rod packing using a rod packing emissions collection system that operates under negative pressure and route the rod packing emissions to a process through a closed vent system that meets the requirements of 40 C.F.R. §§60.5411a(a) and (d).

b. The permittee must demonstrate initial compliance with standards that apply to reciprocating compressor affected facilities as required by Condition 5.2.3.

c. The permittee must demonstrate continuous compliance with standards that apply to reciprocating compressor affected facilities as required by Condition 5.2.4.

d. The permittee must perform the reporting as required by Condition 5.5.2. and the recordkeeping as required by Condition 5.4.2., as applicable.

[45CSR13, R13-2831, 13.1.3.; 45CSR16; 40 C.F.R. §60.5385a]

5.2. Monitoring Requirements

5.2.1. The permittee must determine initial compliance with the standards for each affected facility using the requirements in this condition. The initial compliance period begins upon initial startup and ends no later than one year after the initial startup date for the affected facility. The initial compliance period may be less than one full year.

To achieve initial compliance with the standards for the reciprocating compressor affected facilities EUCE-7 and EUCE-8, the permittee must comply with paragraphs a. through d. of this condition.

a. If complying with paragraphs a.1. or 2. of Condition 5.1.2., during the initial compliance period, the permittee must continuously monitor the number of hours of operation or track the number of months since the last rod packing replacement.

b. If complying with paragraph a.3. of Condition 5.1.2., the permittee must operate the rod packing emissions collection system under negative pressure and route emissions to a process through a closed vent system that meets the requirements of 40 C.F.R. §60.5411(a).

c. The permittee must submit the initial annual report for the reciprocating compressor as required in Condition 5.5.1.

d. The permittee must maintain the records as specified in Condition 5.4.1. for each reciprocating compressor affected facility.

[45CSR13, R13-2831, 13.2.1.; 45CSR16; 40 C.F.R. §60.5410(c)]

5.2.2. For each reciprocating compressor affected facility complying with Condition 5.1.2.a.1. or a.2., the permittee must demonstrate continuous compliance according to paragraphs a. through c. of this condition. For each reciprocating compressor affected facility complying with Condition 5.1.2.a.3., the permittee must demonstrate continuous compliance according to paragraph d. of this condition. **(EUCE-7 and EUCE-8)**

a. The permittee must continuously monitor the number of hours of operation for each reciprocating compressor affected facility or track the number of months since initial startup or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.

b. The permittee must submit the annual report as required in Condition 5.5.1. and maintain records as required in Condition 5.4.1.

c. The permittee must replace the reciprocating compressor rod packing before the total number of hours of operation reaches 26,000 hours or the number of months since the most recent rod packing replacement reaches 36 months.

d. The permittee must operate the rod packing emissions collection system under negative pressure and continuously comply with the closed vent requirements in 40 C.F.R. §§60.5416(a) and (b).

[45CSR13, R13-2831, 13.3.1.; 45CSR16; 40 C.F.R. §60.5415(c)]

5.2.3. The permittee must determine initial compliance with the standards for each affected facility using the requirements in this condition. The initial compliance period begins upon initial startup and ends no later than one year after the initial startup date for the affected facility. The initial compliance period may be less than one full year.

To achieve initial compliance with the standards for the reciprocating compressor affected facilities EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15, the permittee must comply with paragraphs a. through d. of this condition.

a. If complying with paragraphs a.1. or 2. of Condition 5.1.3., during the initial compliance period, the permittee must continuously monitor the number of hours of operation or track the number of months since initial startup or since the last rod packing replacement, whichever is later.

b. If complying with paragraph a.3. of Condition 5.1.3., the permittee must operate the rod packing emissions collection system under negative pressure and route emissions to a process through a closed vent system that meets the requirements of 40 C.F.R. §§60.5411a(a) and (d).

c. The permittee must submit the initial annual report for the reciprocating compressor as required in Condition 5.5.2.

d. The permittee must maintain the records as specified in Condition 5.4.2. for each reciprocating compressor affected facility.

[45CSR13, R13-2831, 13.2.2.; 45CSR16; 40 C.F.R. §60.5410a(c)]

5.2.4. For each reciprocating compressor affected facility complying with Condition 5.1.3.a.1. or a.2., the permittee must demonstrate continuous compliance according to paragraphs a. through c. of this condition. For each reciprocating compressor affected facility complying with Condition 5.1.3.a.3., the permittee must demonstrate continuous compliance according to paragraph d. of this condition. **(EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15)**

a. The permittee must continuously monitor the number of hours of operation for each reciprocating compressor affected facility or track the number of months since initial startup or since the date of the most recent reciprocating compressor rod packing replacement, whichever is later.

b. The permittee must submit the annual reports as required in Conditions 5.5.2.a. and b. and maintain records as required in Condition 5.4.2.a.

c. The permittee must replace the reciprocating compressor rod packing on or before the total number of hours of operation reaches 26,000 hours or the number of months since the most recent rod packing replacement reaches 36 months.

d. The permittee must operate the rod packing emissions collection system under negative pressure and continuously comply with the cover and closed vent requirements in 40 C.F.R. §§60.5416a(a) and (b).

[45CSR13, R13-2831, 13.3.2.; 45CSR16; 40 C.F.R. §60.5415a(c)]

5.3. Testing Requirements

5.3.1. None.

5.4. Recordkeeping Requirements

5.4.1. For the reciprocating compressor affected facilities EUCE-7 and EUCE-8, the permittee must maintain the records identified as specified in 40 C.F.R. §60.7(f) and in this condition. All records required by 40 C.F.R. Part 60 Subpart OOOO must be maintained either on-site or at the nearest local field office for at least five years.

a. For each reciprocating compressor affected facility, the permittee must maintain the records in paragraphs a.1. through 3. of this condition.

1. Records of the cumulative number of hours of operation or number of months since initial startup or the previous replacement of the reciprocating compressor rod packing, whichever is later.

2. Records of the date and time of each reciprocating compressor rod packing replacement, or date of installation of a rod packing emissions collection system and closed vent system as specified in paragraph a.3. of Condition 5.1.2.

3. Records of deviations in cases where the reciprocating compressor was not operated in compliance with the requirements specified in Condition 5.1.2.

b. Records of each closed vent system inspection required under 40 C.F.R. §§60.5416(a)(1) and (2) for reciprocating compressors.

c. A record of each cover inspection required under 40 C.F.R. §60.5416(a)(3) for reciprocating compressors.

d. If the reciprocating compressors are subject to the bypass requirements of 40 C.F.R. §60.5416(a)(4), a record of each inspection or a record of each time the key is checked out or a record of each time the alarm is sounded.

e. If the reciprocating compressors are subject to the closed vent system no detectable emissions requirements of 40 C.F.R. §60.5416(b), a record of the monitoring conducted in accordance with 40 C.F.R. §60.5416(b).

[45CSR16; 40 C.F.R. §§60.5420(c), (c)(3), and (c)(6) to (c)(9)]

5.4.2. For the reciprocating compressor affected facilities EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15, the permittee must maintain the records identified as specified in 40 C.F.R. §60.7(f) and in this condition. All records required by 40 C.F.R. Part 60 Subpart OOOOa must be maintained either on-site or at the nearest local field office for at least five years. Any records required to be maintained by Subpart OOOOa that are submitted electronically via the EPA's CDX may be maintained in electronic format.

a. For each reciprocating compressor affected facility, the permittee must maintain the records in paragraphs a.1. through 3. of this condition.

1. Records of the cumulative number of hours of operation or number of months since initial startup or since the previous replacement of the reciprocating compressor rod packing, whichever is later. Alternatively, a statement that emissions from the rod packing are being routed to a process through a closed vent system under negative pressure.

2. Records of the date and time of each reciprocating compressor rod packing replacement, or date of installation of a rod packing emissions collection system and closed vent system as specified in Condition 5.1.3.a.3.

3. Records of deviations in cases where the reciprocating compressor was not operated in compliance with the requirements specified in Condition 5.1.3., including the date and time the deviation began, duration of the deviation, and a description of the deviation.

b. Records of each closed vent system inspection required under 40 C.F.R. §§60.5416a(a)(1) and (2) and (b) for reciprocating compressors as required in paragraphs b.1. through 3. of this condition.

1. A record of each closed vent system inspection or no detectable emissions monitoring survey. The permittee must include an identification number for each closed vent system (or other unique identification description selected by the permittee) and the date of the inspection.

2. For each defect or leak detected during inspections required by 40 C.F.R. §§60.5416a(a)(1) and (2), (b), (c)(1), or (d), the permittee must record the location of the defect or leak, a description of the defect or the maximum concentration reading obtained if using Method 21 of Appendix A-7 of 40 C.F.R. Part 60, the date of detection, and the date the repair to correct the defect or leak is completed.

3. If repair of the defect is delayed as described in 40 C.F.R. §60.5416a(b)(10), the permittee must record the reason for the delay and the date the permittee expects to complete the repair.

c. A record of each cover inspection required under 40 C.F.R. §60.5416a(a)(3) for reciprocating compressors as required in paragraphs c.1. through 3. of this condition.

1. A record of each cover inspection. The permittee must include an identification number for each cover (or other unique identification description selected by the permittee) and the date of the inspection.

2. For each defect detected during inspections required by 40 C.F.R. §§60.5416a(a)(3) or (c)(2), the permittee must record the location for the defect, a description of the defect, the date of detection, the corrective action taken the repair the defect, and the date the repair to correct the defect is completed.

3. If repair of the defect is delayed as described in 40 C.F.R. §§60.5416a(b)(10) or (c)(5), the permittee must record the reason for the delay and the date they expect to complete the repair.

d. If subject to the bypass requirements of 40 C.F.R. §60.5416a(a)(4) for reciprocating compressors, the permittee must prepare and maintain a record of each inspection or a record of each time the key is checked out or a record of each time the alarm is sounded.

e. For each closed vent system routing to a control device or process, the records of the assessment conducted according to 40 C.F.R. §60.5411a(d):

1. A copy of the assessment conducted according to 40 C.F.R. §60.5411a(d)(1);

2. A copy of the certification according to §60.5411a(d)(1)(i); and

3. The owner or operator shall retain copies of all certifications, assessments, and any related records for a period of five years and make them available if directed by the delegated authority.

[45CSR13, R13-2831, 13.4.6.; 45CSR16; 40 C.F.R. §§60.5420a(c), (c)(3), (c)(6) to (c)(8), and (c)(17)]

5.5. Reporting Requirements

5.5.1. For the reciprocating compressor affected facilities EUCE-7 and EUCE-8, the permittee must submit annual reports containing the information specified in this condition. The initial annual report is due no later than 90 days after the end of the initial compliance period as determined according to Condition 5.2.1. Subsequent annual reports are due no later than the same date each year as the initial annual report. The permittee may submit one report for multiple affected facilities provided the report contains all the information required as specified in 40 C.F.R. §§60.5420(b)(1) through (6). Annual reports may coincide with Title V reports as long as all the required elements of the annual report are included. The permittee may arrange with the

Administrator a common schedule on which reports required by 40 C.F.R. Part 60 may be submitted as long as the schedule does not extend the reporting period.

a. The general information specified below:

1. The company name and address of the affected facility.

2. An identification of each affected facility being included in the annual report.

3. Beginning and ending dates of the reporting period.

4. A certification by a certifying official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

b. For each reciprocating compressor affected facility, the information specified below:

1. The cumulative number of hours of operation or the number of months since initial startup or since the previous reciprocating compressor rod packing replacement, whichever is later.

2. Records of deviations specified in Condition 5.4.1.a.3. that occurred during the reporting period.

[45CSR13, R13-2831, 13.4.3. and 13.4.5.; 45CSR16; 40 C.F.R. §60.5420(b), (b)(1), and (b)(4)]

5.5.2. For the reciprocating compressors EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15, the permittee must submit annual reports containing the information specified in this condition. The permittee must submit annual reports following the procedure specified in paragraph c. of this condition. The initial annual report is due no later than 90 days after the end of the initial compliance period as determined according to Condition 5.2.3. Subsequent annual reports are due no later than the same date each year as the initial annual report. The permittee may submit one report for multiple affected facilities provided the report contains all the information required as specified in this condition. Annual reports may coincide with Title V reports as long as all the required elements of the annual report are included. The permittee may arrange with the Administrator a common schedule on which reports required by 40 C.F.R. Part 60 may be submitted as long as the schedule does not extend the reporting period.

a. The general information specified in paragraphs a.1. through 4. of this condition is required for all reports.

1. The company name, facility site name associated with the affected facility, and address of the affected facility.

2. An identification of each affected facility being included in the annual report.

3. Beginning and ending dates of the reporting period.

4. A certification by a certifying official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

b. For each reciprocating compressor affected facility, the information specified in paragraphs b.1. through 3. of this condition.

1. The cumulative number of hours of operation or the number of months since initial startup or since the previous reciprocating compressor rod packing replacement, whichever is later. Alternatively, a statement that emissions from the rod packing are being routed to a process through a closed vent system under negative pressure.

2. If applicable, for each deviation that occurred during the reporting period and recorded as specified in Condition 5.4.2.a.3., the date and time the deviation began, duration of the deviation and a description of the deviation.

3. If required to comply with Condition 5.1.3.a.3., the information in paragraphs b.3.i. through iii. of this condition.

i. Dates of each inspection required under 40 C.F.R. §§60.5416a(a) and (b);

ii. Each defect or leak identified during each inspection, and date of repair or date of anticipated repair if repair is delayed; and

iii. Date and time of each bypass alarm or each instance the key is checked out if the reciprocating compressor affected facility is subject to the bypass requirements of 40 C.F.R. §60.5416a(a)(4).

c. The permittee must submit reports to the EPA via CEDRI, except as outlined in 40 C.F.R. §60.5420a(b)(11). CEDRI can be accessed through the EPA's CDX (https://cdx.epa.gov/). The permittee must use the appropriate electronic report template on the CEDRI website for Subpart OOOO (https://www.epa.gov/electronic-reporting-air-emissions/cedri/).

d. The permittee must submit the certification signed by the qualified professional engineer or in-house engineer according to 40 C.F.R. §60.5411a(d) for each closed vent system routing to a control device or process.

[45CSR13, R13-2831, 13.4.4. and 13.4.6.; 45CSR16; 40 C.F.R. §§60.5420a(b), (b)(1), (b)(4), (b)(11), and (b)(12)]

5.6. Compliance Plan

5.6.1. None.

6.0 40 C.F.R. Part 60 Subpart OOOOa Requirements for Fugitive Emissions Components

6.1. Limitations and Standards

6.1.1. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. The provisions for exemption from compliance during periods of startup, shutdown and malfunctions provided for in 40 C.F.R. §60.8(c) do not apply to Subpart OOOOa.
[45CSR16; 40 C.F.R. §60.5370a(b)]

6.1.2. For each affected facility under 40 C.F.R. §60.5365a(j), the permittee must reduce GHG (in the form of a limitation on emissions of methane) and VOC emissions by complying with the requirements of paragraphs a. through j. of this condition. The requirements in this condition are independent of the closed vent system and cover requirements in §60.5411a. Alternatively, the permittee may comply with the requirements of §60.5398b, including the notification, recordkeeping, and reporting requirements outlined in §60.5424b. For the purpose of Subpart OOOOa, compliance with the requirements in §60.5398b will be deemed compliance with §60.5397a. When complying with §60.5398b, the definitions in §60.5430b shall apply for those activities conducted under §60.5398b.

a. The permittee must monitor all fugitive emissions components, as defined in 40 C.F.R. §60.5430a, in accordance with paragraphs b. through g. of this condition. The permittee must repair all sources of fugitive emissions in accordance with paragraph h. of this condition. The permittee must keep records in accordance with paragraph i. of this condition and report in accordance with paragraph j. of this condition. For the purposes of this condition, fugitive emissions are defined as any visible emission from a fugitive emissions component observed using optical gas imaging or an instrument reading of 500 parts per million (ppm) or greater using Method 21 of Appendix A-7 to 40 C.F.R. Part 60.

b. The permittee must develop an emissions monitoring plan that covers the collection of fugitive emissions components at compressor stations within each company-defined area in accordance with paragraphs c. and d. of this condition.

c. Fugitive emissions monitoring plans must include the elements specified in paragraphs c.1. through 8. of this condition, at a minimum.

1. Frequency for conducting surveys. Surveys must be conducted at least as frequently as required by paragraphs f. and g. of this condition.

2. Technique for determining fugitive emissions (i.e., Method 21 of Appendix A-7 to 40 C.F.R. Part 60 or optical gas imaging meeting the requirements in paragraphs c.7.i. through vii. of this condition).

3. Manufacturer and model number of fugitive emissions detection equipment to be used.

4. Procedures and timeframes for identifying and repairing fugitive emissions components from which fugitive emissions are detected, including timeframes for fugitive emissions components that are

unsafe to repair. The repair schedule must meet the requirements of paragraph h. of this condition at a minimum.

5. Procedures and timeframes for verifying fugitive emissions component repairs.

6. Records that will be kept and the length of time records will be kept.

7. If using optical gas imaging, the plan must also include the elements specified in paragraphs c.7.i. through vii. of this condition.

   i. Verification that the optical gas imaging equipment meets the specifications of paragraphs c.7.i.a. and b. of this condition. This verification is an initial verification and may either be performed by the facility, by the manufacturer, or by a third party. For the purposes of complying with the fugitive emissions monitoring program with optical gas imaging, a fugitive emission is defined as any visible emissions observed using optical gas imaging.

      a. The optical gas imaging equipment must be capable of imaging gases in the spectral range for the compound of highest concentration in the potential fugitive emissions.

      b. The optical gas imaging equipment must be capable of imaging a gas that is half methane, half propane at a concentration of 10,000 ppm at a flow rate of ≤ 60 g/hr from a quarter inch diameter orifice.

   ii. Procedure for a daily verification check.

   iii. Procedure for determining the operator's maximum viewing distance from the equipment and how the operator will ensure that this distance is maintained.

   iv. Procedure for determining maximum wind speed during which monitoring can be performed and how the operator will ensure monitoring occurs only at wind speeds below this threshold.

   v. Procedures for conducting surveys, including the items specified in paragraphs c.7.v.a. through c. of this condition.

      a. How the operator will ensure an adequate thermal background is present in order to view potential fugitive emissions.

      b. How the operator will deal with adverse monitoring conditions, such as wind.

      c. How the operator will deal with interferences (e.g., steam).

   vi. Training and experience needed prior to performing surveys.

   vii. Procedures for calibration and maintenance. At a minimum, procedures must comply with those recommended by the manufacturer.

8. If using Method 21 of Appendix A-7 of 40 C.F.R. Part 60, the plan must also include the elements specified in paragraphs c.8.i. and iii. of this condition. For the purposes of complying with the fugitive emissions monitoring program using Method 21 of Appendix A-7 of 40 C.F.R. Part 60, a fugitive emission is defined as an instrument reading of 500 ppm or greater.

i. ***Verification that monitoring equipment meets the requirements specified in Section 6.0 of Method 21 at 40 C.F.R. Part 60, Appendix A-7.*** For purposes of instrument capability, the fugitive emissions definition shall be 500 ppm or greater methane using a FID-based instrument. If the permittee wishes to use an analyzer other than a FID-based instrument, the permittee must develop a site-specific fugitive emission definition that would be equivalent to 500 ppm methane using a FID-based instrument (e.g., 10.6 eV PID with a specified isobutylene concentration as the fugitive emission definition would provide equivalent response to the compound of interest).

ii. ***Procedures for conducting surveys.*** At a minimum, the procedures shall ensure that the surveys comply with the relevant sections of Method 21 at 40 C.F.R. Part 60, Appendix A-7, including Section 8.3.1.

iii. ***Procedures for calibration.*** The instrument must be calibrated before use each day of its use by the procedures specified in Method 21 of Appendix A-7 of 40 C.F.R. Part 60. At a minimum, the permittee must also conduct precision tests at the interval specified in Method 21 of Appendix A-7 of 40 C.F.R. Part 60, Section 8.1.2, and a calibration drift assessment at the end of each monitoring day. The calibration drift assessment must be conducted as specified in paragraph c.8.iii.a. of this condition. Corrective action for drift assessments is specified in paragraphs c.8.iii.b. and c. of this condition.

a. Check the instrument using the same calibration gas that was used to calibrate the instrument before use. Follow the procedures specified in Method 21 of Appendix A-7 of 40 C.F.R. Part 60, Section 10.1, except do not adjust the meter readout to correspond to the calibration gas value. If multiple scales are used, record the instrument reading for each scale used. Divide the arithmetic difference of the initial and post-test calibration response by the corresponding calibration gas value for each scale and multiply by 100 to express the calibration drift as a percentage.

b. If a calibration drift assessment shows a negative drift of more than 10 percent, then all equipment with instrument readings between the fugitive emission definition multiplied by (100 minus the percent of negative drift/divided by 100) and the fugitive emission definition that was monitored since the last calibration must be re-monitored.

c. If any calibration drift assessment shows a positive drift of more than 10 percent from the initial calibration value, then, at the owner/operator's discretion, all equipment with instrument readings above the fugitive emission definition and below the fugitive emission definition multiplied by (100 plus the percent of positive drift/divided by 100) monitored since the last calibration may be re-monitored.

d. Each fugitive emissions monitoring plan must include the elements specified in paragraphs d.1. through 3. of this condition, at a minimum, as applicable.

1. If using optical gas imaging, the plan must include procedures to ensure that all fugitive emissions components are monitored during each survey. Example procedures include, but are not limited to, a sitemap with an observation path, a written narrative of where the fugitive emissions components are located and how they will be monitored, or an inventory of fugitive emissions components.

2. If using Method 21 of Appendix A-7 of 40 C.F.R. Part 60, the plan must include a list of fugitive emissions components to be monitored and the method for determining the location of fugitive emissions components to be monitored in the field (e.g., tagging, identification on a process and instrumentation diagram, etc.).

3. The fugitive emissions monitoring plan must include the written plan developed for all of the fugitive emissions components designated as difficult-to-monitor in accordance with paragraph g.2. of this condition, and the written plan for fugitive emissions components designated as unsafe-to-monitor in accordance with g.3. of this condition.

e. Each monitoring survey shall observe each fugitive emissions component, as defined in 40 C.F.R. §60.5430a, for fugitive emissions.

f. The permittee must conduct an initial monitoring survey within 90 days of the startup of a new compressor station for each collection of fugitive emissions components at the new compressor station. For a modified collection of fugitive emissions components at a compressor station, the initial monitoring survey must be conducted within 90 days of the modification.

g. A monitoring survey of each collection of fugitive emissions components at a compressor station must be performed at the frequencies specified in paragraph g.1. of this condition, with the exceptions noted in paragraphs g.2. and g.3. of this condition.

1. A monitoring survey of the collection of fugitive emissions components at a compressor station must be conducted at least quarterly after the initial survey. Consecutive quarterly monitoring surveys must be conducted at least 60 days apart.

2. Fugitive emissions components that cannot be monitored without elevating the monitoring personnel more than 2 meters above the surface may be designated as difficult-to-monitor. Fugitive emissions components that are designated difficult-to-monitor must meet the specifications of paragraphs g.2.i. through iv. of this condition.

i. A written plan must be developed for all of the fugitive emissions components designated difficult-to-monitor. This written plan must be incorporated into the fugitive emissions monitoring plan required by paragraphs b., c., and d. of this condition.

ii. The plan must include the identification and location of each fugitive emissions component designated as difficult-to-monitor.

iii. The plan must include an explanation of why each fugitive emissions component designated as difficult-to-monitor is difficult-to-monitor.

iv. The plan must include a schedule for monitoring the difficult-to-monitor fugitive emissions components at least once per calendar year.

3. Fugitive emissions components that cannot be monitored because monitoring personnel would be exposed to immediate danger while conducting a monitoring survey may be designated as unsafe-to-monitor. Fugitive emissions components that are designated unsafe-to-monitor must meet the specifications of paragraphs g.3.i. through iv. of this condition.

i. A written plan must be developed for all of the fugitive emissions components designated unsafe-to-monitor. This written plan must be incorporated into the fugitive emissions monitoring plan required by paragraphs b., c., and d. of this condition.

ii. The plan must include the identification and location of each fugitive emissions component designated as unsafe-to-monitor.

iii. The plan must include an explanation of why each fugitive emissions component designated as unsafe-to-monitor is unsafe-to-monitor.

iv. The plan must include a schedule for monitoring the fugitive emissions components designated as unsafe-to-monitor.

h. Each identified source of fugitive emissions shall be repaired, as defined in 40 C.F.R. §60.5430a, in accordance with paragraphs h.1. and 2. of this condition.

1. A first attempt at repair shall be made no later than 30 calendar days after detection of the fugitive emissions.

2. Repair shall be completed as soon as practicable, but no later than 30 calendar days after the first attempt at repair as required in paragraph h.1. of this condition.

3. Delay of repair will be allowed if the conditions in paragraphs h.3.i. or ii. of this section are met.

i. If the repair is technically infeasible, would require a vent blowdown, a compressor station shutdown, or would be unsafe to repair during operation of the unit, the repair must be completed during the next scheduled compressor station shutdown for maintenance, after a scheduled vent blowdown, or within 2 years of detecting the fugitive emissions, whichever is earliest. For the purposes of this paragraph h.3., a vent blowdown is the opening of one or more blowdown valves to depressurize major production and processing equipment, other than a storage vessel.

ii. If the repair requires replacement of a fugitive emissions component or a part thereof, but the replacement cannot be acquired and installed within the repair timelines specified in paragraphs h.1. and 2. of this section due to either of the conditions specified in paragraphs h.3.ii.a. or b. of this section, the repair must be completed in accordance with paragraph h.3.ii.c. of this section and documented in accordance with Condition 6.4.1.c.9.

a. Valve assembly supplies had been sufficiently stocked but are depleted at the time of the required repair.

b. A replacement fugitive emissions component or a part thereof requires custom fabrication.

c. The required replacement must be ordered no later than 10 calendar days after the first attempt at repair. The repair must be completed as soon as practicable, but no later than 30 calendar days after receipt of the replacement component, unless the repair requires a compressor station shutdown. If the repair requires a compressor station shutdown, the repair must be completed in accordance with the timeframe specified in paragraph h.3.i. of this condition.

4. Each identified source of fugitive emissions must be resurveyed to complete repair according to the requirements in paragraphs h.4.i. through iv. of this condition to ensure that there are no fugitive emissions.

   i. The operator may resurvey the fugitive emissions components to verify the repair using either Method 21 of Appendix A-7 of 40 C.F.R. Part 60 or optical gas imaging.

   ii. For each repair that cannot be made during the monitoring survey when the fugitive emissions are initially found, a digital photograph must be taken of that component or the component must be tagged during the monitoring survey when the fugitives were initially found for identification purposes and subsequent repair. The digital photograph must include the date that the photograph was taken and must clearly identify the component by location within the site (e.g., the latitude and longitude of the component or by other descriptive landmarks visible in the picture).

   iii. Operators that use Method 21 of Appendix A-7 of 40 C.F.R. Part 60 to resurvey the repaired fugitive emissions components are subject to the resurvey provisions specified in paragraphs h.4.iii.a. and b. of this condition.

      a. A fugitive emissions component is repaired when the Method 21 instrument indicates a concentration of less than 500 ppm above background or when no soap bubbles are observed when the alternative screening procedures specified in Section 8.3.3 of Method 21 of Appendix A-7 of 40 C.F.R. Part 60 are used.

      b. Operators must use the Method 21 monitoring requirements specified in paragraph c.8.ii. of this condition or the alternative screening procedures specified in Section 8.3.3 of Method 21 of Appendix A-7 of 40 C.F.R. Part 60.

   iv. Operators that use optical gas imaging to resurvey the repaired fugitive emissions components, are subject to the resurvey provisions specified in paragraphs h.4.iv.a. and b. of this condition.

      a. A fugitive emissions component is repaired when the optical gas imaging instrument shows no indication of visible emissions.

      b. Operators must use the optical gas imaging monitoring requirements specified in paragraph c.7. of this condition.

i. Records for each monitoring survey shall be maintained as specified in Condition 6.4.1.

j. Annual reports shall be submitted for each collection of fugitive emissions components at a compressor station that include the information specified in Condition 6.5.1.b. Multiple collection of fugitive emissions components at a compressor station may be included in a single annual report.

[45CSR13, R13-2831, 14.1.1.; 45CSR16; 40 C.F.R. §§60.5397a(a) to (e), (f)(2), (g), (g)(2) to (4), and (h) to (j)]

6.2. Monitoring Requirements

6.2.1. The permittee must determine initial compliance with the standards for each collection of fugitive emissions components at a compressor station using the requirements in paragraphs a. through e. of this condition. The initial compliance period begins upon initial startup and ends no later than 1 year after the initial startup date for the affected facility. The initial compliance period may be less than 1 full year.

a. The permittee must develop a fugitive emissions monitoring plan as required in Conditions 6.1.2.b., c., and d.

b. The permittee must conduct an initial monitoring survey as required in Condition 6.1.2.f.

c. The permittee must maintain the records specified in Condition 6.4.1.

d. The permittee must repair each identified source of fugitive emissions for each affected facility as required in Condition 6.1.2.h.

e. The permittee must submit the initial annual report for each collection of fugitive emissions components at a compressor station as required in Conditions 6.5.1.a. and b.

[45CSR16; 40 C.F.R. §60.5410a(j)]

6.2.2. For each collection of fugitive emissions components at a compressor station, the permittee must demonstrate continuous compliance with the fugitive emission standards specified in Condition 6.1.2. according to paragraphs a. through d. of this condition.

a. The permittee must conduct periodic monitoring surveys as required in Condition 6.1.2.g.

b. The permittee must repair each identified source of fugitive emissions as required in Condition 6.1.2.h.

c. The permittee must maintain records as specified in Condition 6.4.1.

d. The permittee must submit annual reports for collection of fugitive emissions components at a compressor station as required in Conditions 6.5.1.a. and b.

[45CSR16; 40 C.F.R. §60.5415a(h)]

6.3. Testing Requirements

6.3.1. None.

6.4. Recordkeeping Requirements

6.4.1. The permittee must maintain the records identified as specified in 40 C.F.R. §60.7(f) and specified in this condition for each collection of fugitive emissions components at a compressor station. All records required by 40 C.F.R. Part 60 Subpart OOOOa must be maintained either on-site or at the nearest local field office for at least 5 years. Any records required to be maintained by Subpart OOOOa that are submitted electronically via the EPA's CDX may be maintained in electronic format.

a. The date of the startup or the date of the modification for each collection of fugitive emissions components at a compressor station.

b. The fugitive emissions monitoring plan as required in paragraphs b. through d. of Condition 6.1.2.

c. The records of each monitoring survey as follows:

1. Date of the survey.

2. Beginning and end time of the survey.

3. Name of the operator(s), training, and experience of the operator(s) performing the survey.

4. Monitoring instrument used.

5. Fugitive emissions component identification when Method 21 of 40 C.F.R. Part 60, Appendix A-7 is used to perform the monitoring survey.

6. Ambient temperature, sky conditions, and maximum wind speed at the time of the survey. For compressor stations, operating mode of each compressor (i.e., operating, standby, pressurized, and not operating-depressurized modes) at the station at the time of the survey.

7. Any deviations from the monitoring plan or a statement that there were no deviations from the monitoring plan.

8. Records of calibrations for the instrument used during the monitoring survey.

9. Documentation of each fugitive emission detected during the monitoring survey, including the information specified in paragraphs c.9.i. through ix. of this condition.

i. Location of each fugitive emission identified.

ii. Type of fugitive emissions component, including designation as difficult-to-monitor or unsafe-to-monitor, if applicable.

iii. If Method 21 of Appendix A-7 of 40 C.F.R. Part 60 is used for detection, record the component ID and instrument reading.

iv. For each repair that cannot be made during the monitoring survey when the fugitive emissions are initially found, a digital photograph or video must be taken of that component or the component must be tagged for identification purposes. The digital photograph must include the date that the photograph was taken and must clearly identify the component by location within the site (e.g., the latitude and longitude of the component or by other descriptive landmarks visible in the picture). The digital photograph or identification (e.g., tag) may be removed after the repair is completed, including verification of repair with the resurvey.

v. The date of first attempt at repair of the fugitive emissions component(s).

vi. The date of successful repair of the fugitive emissions component, including the resurvey to verify repair and instrument used for the resurvey.

vii. Identification of each fugitive emission component placed on delay of repair and explanation for each delay of repair.

viii. For each fugitive emission component placed on delay of repair for reason of replacement component unavailability, the operator must document: the date the component was added to the delay of repair list, the date the replacement fugitive component or part thereof was ordered, the anticipated component delivery date (including any estimated shipment or delivery date provided by the vendor), and the actual arrival date of the component.

ix. Date of planned shutdowns that occur while there are any components that have been placed on delay of repair.

d. For each collection of fugitive emissions components at a compressor station complying with an alternative means of emissions limitation under 40 C.F.R. §60.5399a, the permittee must maintain the records specified by the specific alternative fugitive emissions standard for a period of at least 5 years.

e. If complying with the alternative GHG and VOC standard under 40 C.F.R. §60.5398b, in lieu of the information specified in paragraphs b. through c. of this condition, the permittee must maintain the records specified in 40 C.F.R. §60.5424b.

[45CSR16; 40 C.F.R. §§60.5420a(c), (c)(15), and (c)(15)(i), (vi) to (ix)]

6.5. Reporting Requirements

6.5.1. The permittee must submit annual reports containing the information specified in paragraphs a. and b. of this condition. The permittee must submit annual reports following the procedure specified in paragraph c. of this condition. The initial annual report is due no later than 90 days after the end of the initial compliance period as determined according to Condition 6.2.1. Subsequent annual reports are due no later than the same date each year as the initial annual report. The permittee may submit one report for multiple affected facilities provided the report contains all of the information specified in paragraphs a. and b. of this condition. Annual reports may coincide with Title V reports as long as all the required elements of the annual report are included. The permittee may arrange with the Administrator a common schedule on which reports required by 40 C.F.R. Part 60 may be submitted as long as the schedule does not extend the reporting period.

a. The general information specified below is required for all reports:

1. The company name, facility site name associated with the affected facility, and address of the affected facility.

2. An identification of each affected facility being included in the annual report.

3. Beginning and ending dates of the reporting period.

4. A certification by a certifying official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

b. For the collection of fugitive emissions components at each compressor station, report the information specified in paragraphs b.1. through 3. of this condition, as applicable.

1. i. Designation of the type of site (i.e., well site or compressor station) at which the collection of fugitive emissions components is located.

   ii. For each collection of fugitive emissions components at a compressor station that became an affected facility during the reporting period, the permittee must include the date of startup or the date of modification.

2. For each fugitive emissions monitoring survey performed during the annual reporting period, the information specified in paragraphs b.2.i. through vii. of this condition.

   i. Date of the survey.

   ii. Monitoring instrument used.

   iii. Any deviations from the monitoring plan elements under Conditions 6.1.2.c.1., c.2., c.7., and c.8.i. or a statement that there were no deviations from these elements of the monitoring plan.

   iv. Number and type of components for which fugitive emissions were detected.

   v. Number and type of fugitive emissions components that were not repaired as required in Condition 6.1.2.h.

   vi. Number and type of fugitive emission components (including designation as difficult-to-monitor or unsafe-to-monitor, if applicable) on delay of repair and explanation for each delay of repair.

   vii. Date of planned shutdown(s) that occurred during the reporting period if there are any components that have been placed on delay of repair.

3. For each collection of fugitive emissions components at a compressor station complying with an alternative fugitive emissions standard under 40 C.F.R. §60.5399a, in lieu of the information specified in paragraphs b.1. and 2. of this condition, the permittee must provide the information specified in paragraphs b.3.i. through iii. of this condition.

   i. The alternative standard with which you are complying.

   ii. The site-specific reports specified by the specific alternative fugitive emissions standard, submitted in the format in which they were submitted to the state, local, or tribal authority. If the report is in hard copy, the permittee must scan the document and submit it as an electronic attachment to the annual report required in this condition.

   iii. If the report specified by the specific alternative fugitive emissions standard is not site-specific, the permittee must submit the information specified in paragraphs b.1. and 2. of this condition for each individual site complying with the alternative standard.

4. If complying with the alternative GHG and VOC standard under 40 C.F.R. §60.5398b, in lieu of the information specified in paragraph b.2. of this condition, the permittee must provide the information specified in 40 C.F.R. §60.5424b.

c. The permittee must submit reports to the EPA via CEDRI, except as outlined in 40 C.F.R. §60.5420a(b)(11). CEDRI can be accessed through the EPA's CDX (https://cdx.epa.gov/). The permittee must use the appropriate electronic report template on the CEDRI website for 40 C.F.R. Part 60 Subpart OOOOa (https://www.epa.gov/electronic-reporting-air-emissions/cedri/).

[45CSR16; 40 C.F.R. §§60.5420a(b), (b)(1), (b)(7), (b)(7)(i)(A), (b)(7)(i)(B), (b)(7)(ii) to (iv), and (b)(11)]

6.6. Compliance Plan

6.6.1. None.

7.0 Natural Gas Dehydration Units [Emission Point IDs: EPDSV-1 to EPDSV-3 and EPDFT-1 to EPDFT-3]

7.1. Limitations and Standards

7.1.1. Maximum Throughput Limitation. The maximum dry natural gas throughput to each of the glycol dehydration units shall not exceed the following:

Emission Unit ID	Emission Point ID	Emission Unit	Design Capacity
EUDFT-1/ EUDSV-1	EPDFT-1/ EPDSV-1	Dehy Flash Tank Vent Controlled by Flare; Dehy Still Vent Controlled by Condenser/Reboiler	55 mmscfd
EUDFT-2/ EUDSV-2	EPDFT-2/ EPDSV-2	Dehy Flash Tank Vent Controlled by Flare; Dehy Still Vent Controlled by Condenser/Reboiler	55 mmscfd
EUDFT-3/ EUDSV-3	EPDFT-3/ EPDSV-3	Dehy Flash Tank Vent Controlled by Flare; Dehy Still Vent Controlled by Condenser/Reboiler	55 mmscfd

Compliance with the Maximum Throughput Limitation shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the monthly throughput at any given time during the previous twelve consecutive calendar months.

[45CSR13, R13-2831, 6.1.1.]

7.1.2. The still vent of each dehydration unit shall be vented to a dedicated BTEX Condenser through a closed vent system. The non-condensable gas shall be vented back to the respective reboiler through a closed vent system. The control device(s) shall be operated according to the manufacturer's specifications and shall be properly maintained in a manner which prevents the unit from freezing.
[45CSR13, R13-2831, 6.1.2.]

7.1.3. *Condensers*. The permittee shall comply with the requirements below:

a. The still vent of each dehydration unit shall be routed to a dedicated BTEX Condenser and BTEX Accumulator (2-phase separator) through a closed vent system. The non-condensable gas from each BTEX Accumulator shall be vented back to the respective reboiler through a closed vent system.

b. Each glycol dehydration unit/still column (EPDSV-1 to EPDSV-3) shall be equipped with a fully functional BTEX Buster (APCCOND-1 to APCCOND-3) at all times. The control device(s) (APCCOND-1 to APCCOND-3) shall be operated according to the manufacturer's specifications and shall be properly maintained in a manner which prevents the unit from freezing.

c. The non-condensable gas from the BTEX Accumulator shall be routed to the reboiler and combusted through a closed vent system.

d. The flash tank off-gases from each flash tank shall be routed to a flash gas header to the facility flare or to the inlet separator of the station for re-processing. The routing of the flash tank off-gases shall be done through a closed vent system.

e. The pilot light for each reboiler burner shall be lit at all times when the dehydration unit is in operation.

f. The maximum flow rate of glycol through each dehydration unit shall not exceed 15 gpm. The unit shall be operated with either an electric or gas pneumatic driven pump that does not exceed the above flow rate.

g. The BTEX Condenser shall be operated in a manner to prevent liquids carryover to the respective reboiler.

h. The system shall be constructed of hard piping.

i. The system shall be constructed and maintained free of leaks.

j. Detected leaks shall be addressed in accordance with the applicable fugitive emission requirements specified in 40 C.F.R. Part 60 Subpart OOOOa.

[45CSR13, R13-2831, 6.1.3.]

7.1.4. *Flare*. The permittee shall install and operate a 5.0 mmBTU/hr flare (APCFLARE) to control VOC and HAP emissions from the glycol dehydration unit flash tanks (EUDFT-1 to EUDFT-3). This flare shall be designed to achieve a minimum guaranteed control efficiency of 98% for volatile organic compounds (VOC) and hazardous air pollutants (HAP) emissions. The permittee shall comply with the design and operating requirements below:

a. Vapors that are being controlled by the flare shall be routed to the flare at all times;

b. The flare shall be operated with a flame present at all times, as determined by the methods specified in Condition 7.2.1.;

c. The flare shall be operated at all times when emissions are vented to it;

d. To ensure compliance with Condition 7.1.4.c., the permittee shall monitor in accordance with Condition 7.2.1.;

e. The flare shall be designed for and operated with no visible emissions as determined by the methods specified in Condition 7.3.1. except for periods not to exceed a total of 5 minutes during any 2 consecutive hours; and

f. The permittee shall monitor the flare to ensure that it is operated and maintained in conformance with its design.

g. The flare is subject to the applicable requirements of 45CSR6.

1. No person shall cause or allow particulate matter to be discharged from the flare into the open air in excess of 2.09 lbs/hr.
[45CSR§6-4.1.]

2. No person shall cause or allow emission of smoke into the atmosphere from any incinerator which is twenty percent (20%) opacity or greater.
[45CSR§6-4.3.]

3. The provisions of paragraph g.2. shall not apply to smoke which is less than forty percent (40%) opacity, for a period or periods aggregating no more than eight (8) minutes per start-up, or six (6) minutes in any sixty (60)-minute period for stoking operations.
[45CSR§6-4.4.]

4. No person shall cause or allow the emission of particles of unburned or partially burned refuse or ash from any incinerator which are large enough to be individually distinguished in the open air.
[45CSR§6-4.5.]

5. Incinerators, including all associated equipment and grounds, shall be designed, operated and maintained so as to prevent the emission of objectionable odors.
[45CSR§6-4.6.]

h. The effluent and purge gas streams shall be routed to the flare through a closed vent system. The closed vent system as required in this condition shall meet the following:

1. The system shall be constructed of hard piping.

2. The system shall be constructed and maintained free of leaks.

3. Detected leaks shall be repaired as soon as practicable with the first attempt at repair within 5 calendar days after detecting the leak. Repair shall be completed no later than 15 calendar days after the leak is detected.

[45CSR13, R13-2831, 6.1.4.]

7.1.5. Emissions from the flare (APCFLARE) shall not exceed the following maximum hourly and annual emission limits:

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tpy)
Nitrogen Oxides	1.96	2.15
Carbon Monoxide	6.20	6.79
Volatile Organic Compounds	12.73	22.64
Total HAPs	3.18	6.36

[45CSR13, R13-2831, 6.1.5.]

7.1.6. Any source that determines it is not a major source but has actual emissions of 5 tpy or more of a single HAP, or 12.5 tpy or more of a combination of HAPs (i.e., 50 percent of the major source thresholds), shall update its major source determination within one year of the prior determination or October 15, 2012, whichever is later, and each year thereafter, using gas composition data measured during the preceding twelve months.
[45CSR13, R13-2831, 6.1.6.; 45CSR34; 40 C.F.R. §63.760(c)]

7.1.7. The permittee is exempt from the requirements of 40 C.F.R. §63.764(d) if the criteria below is met, except that the records of the determination of these criteria must be maintained as required in 40 C.F.R. §63.774(d)(1).

a. The actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram per year (1 tpy), as determined by the procedures specified in §63.772(b)(2) of 40 C.F.R. Part 63 Subpart HH.

[45CSR13, R13-2831, 6.1.7.; 45CSR34; 40 C.F.R. §§63.764(e), (e)(1), and (e)(1)(ii)]

7.1.8. At all times, the permittee must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.
[45CSR34; 40 C.F.R. §63.764(j)]

7.2. Monitoring Requirements

7.2.1. To demonstrate compliance with the pilot flame requirements of Condition 7.1.4.b. and 7.1.4.d., the presence of a pilot flame shall be continuously monitored using a thermocouple or any other equivalent device to detect the presence of a flame when emissions are vented to it. The pilot shall be equipped such that it sounds an alarm, or initiates notification via remote alarm to the nearest field office, when the pilot light is out.
[45CSR13, R13-2831, 6.2.1.]

7.2.2. The permittee shall monitor the throughput of dry natural gas fed to the dehydration system on a monthly basis for each of the glycol dehydration units (EUDHY-1 to EUDHY-3).
[45CSR13, R13-2831, 6.2.2.]

7.2.3. The permittee shall regularly inspect and properly maintain each BTEX Condenser (APCCOND-1 to APCCOND-3) in conformance with manufacturer recommendations.
[45CSR13, R13-2831, 6.2.3.]

7.3. Testing Requirements

7.3.1. In order to demonstrate compliance with the opacity requirements of Condition 7.1.4.e., the permittee shall conduct a Method 22 opacity test for at least two hours. This test shall demonstrate no visible emissions are observed for more than a total of 5 minutes during any 2 consecutive hour period using 40 C.F.R. Appendix A Method 22. The permittee shall conduct this test within one (1) year of permit issuance or initial startup whichever is later. The visible emission checks shall determine the presence or absence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water

(condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40 C.F.R. Part 60, Appendix A, Method 22 or from the lecture portion of 40 C.F.R. Part 60, Appendix A, Method 9 certification course.
[45CSR13, R13-2831, 6.3.1.]

7.3.2. In order to demonstrate compliance with Condition 7.1.5., upon request of the Director, the permittee shall demonstrate compliance with the VOC and HAP emissions thresholds using GLYCalc Version 3.0 or higher. The permittee shall sample in accordance with GPA Method 2166 and analyze the samples utilizing the extended GPA Method 2286 as specified in the GRI-GLYCalc V4 Technical Reference User Manual and Handbook.
[45CSR13, R13-2831, 6.3.2.]

7.3.3. **Determination of glycol dehydrator benzene emissions.** In order to demonstrate that the benzene emissions are less than 1 tpy, the permittee shall determine the actual average benzene emissions using the procedure in the paragraph below. Emissions shall be determined either uncontrolled, or with federally enforceable controls in place.

The owner or operator shall determine actual average benzene or BTEX emissions using the model GRI-GLYCalc™, Version 3.0 or higher, and the procedures presented in the associated GRI-GLYCalc™ Technical Reference Manual. Inputs to the model shall be representative of actual operating conditions of the glycol dehydration unit and may be determined using the procedures documented in the Gas Research Institute (GRI) report entitled "Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions" (GRI-95/0368.1).
[45CSR13, R13-2831, 6.3.3.; 45CSR34; 40 C.F.R. §§63.772(b)(2) and (b)(2)(i)]

7.3.4. Use of the ProMax model, Version 5.0 or higher, as an alternative to the GLYCalc model is subject to the following requirements:

Inputs to the ProMax, Version 5.0 or above, software shall include the parameters listed below, which must be representative of the actual operating conditions of the glycol dehydration unit:

a. Wet gas flowrate

b. Wet gas composition (dry basis)

c. Wet gas water content (if unknown, can assume a worst-case of 100% saturation)

d. Wet gas (absorber) temperature

e. Wet gas (absorber) pressure

f. Glycol circulation rate (or dry gas water content or glycol circulation ratio)

g. Dry gas water content

h. Lean glycol water content

i. Gas pump volume ratio (when gas injection pump is used)

j. Reboiler temperature

k. Flash tank parameters (when installed)

1. Temperature

2. Pressure

l. Control device parameters (when installed)

1. Combustion device destruction efficiency

2. Condenser temperature and pressure

m. Stripping gas (if used)

1. Type (dry gas, flash gas, nitrogen)

2. Flowrate

[45CSR13, R13-2831, 6.3.4.]

7.3.5. Affected facilities using this alternative (ProMax as an alternative to GLYCalc under 40 C.F.R. Part 63 Subpart HH) for their affected glycol dehydration units must notify the responsible agency before use of the alternative and notification should include a copy of this letter. Facilities must include a copy of this letter with each report presenting results using the ProMax software.
[45CSR13, R13-2831, 6.3.5.]

7.3.6. Once a facility chooses to use ProMax as an alternative to GLYCalc under one or more of the 40 C.F.R. Part 63 Subpart HH provisions listed above, the facility must continue to use ProMax in meeting the provision(s) until the owner/operator receives approval from this office for use of a new alternative method or the responsible agency for use of any other options in Subpart HH, including returning to the use of GLYCalc (see §63.7(f)(5)).
[45CSR13, R13-2831, 6.3.6.]

7.3.7. At such reasonable times as the Secretary may designate, the operator of any incinerator shall be required to conduct or have conducted stack tests to determine the particulate matter loading, by using 40 C.F.R. Part 60 Appendix A, Method 5 or other equivalent U.S. EPA approved method approved by the Secretary, in exhaust gases. Such tests shall be conducted in such manner as the Secretary may specify and be filed on forms and in a manner acceptable to the Secretary. The Secretary may, at the Secretary's option, witness or conduct such stack tests. Should the Secretary exercise his or her option to conduct such tests, the operator will provide all the necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment such as scaffolding, railings and ladders to comply with generally accepted good safety practices.

The Secretary may conduct such other tests as the Secretary may deem necessary to evaluate air pollution emissions other than those noted above.

[45CSR13, R13-2831, 6.1.4.g.; 45CSR§§6-7.1. and -7.2.]

7.4. Recordkeeping Requirements

7.4.1. For the purpose of demonstrating compliance with the requirements set forth in Conditions 7.1.5. and 7.3.2., the permittee shall maintain records of testing conducted in accordance with Condition 7.3.2.
[45CSR13, R13-2831, 6.4.1.]

7.4.2. The permittee shall document and maintain the corresponding records specified by the on-going monitoring requirements of Section 7.2. and the testing requirements of Section 7.3.
[45CSR13, R13-2831, 6.4.2.]

7.4.3. For the purpose of demonstrating compliance with the minor source status of hazardous air pollutants required by Condition 7.1.5., the permittee shall maintain a record of all potential to emit (PTE) HAP calculations for the entire affected facility. These records shall include the natural gas compressor engines and ancillary equipment.
[45CSR13, R13-2831, 6.4.3.]

7.4.4. The permittee shall maintain a record of the dry natural gas throughput through the dehydration system to demonstrate compliance with Condition 7.1.1.
[45CSR13, R13-2831, 6.4.4.]

7.4.5. To demonstrate that the permittee is exempt from the requirements of 40 C.F.R. §63.764(d) if the actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere is less than 0.90 megagram per year (1 tpy), as determined by the procedures specified in §63.772(b)(2) and Condition 7.3.3. of this permit, records of the actual average benzene emissions (in terms of benzene emissions per year) shall be maintained.
[45CSR13, R13-2831, 6.4.5.; 45CSR34; 40 C.F.R. §§63.764(e), 63.774(d)(1) and (d)(1)(ii)]

7.4.6. All records required under Section 7.4. 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.
[45CSR13, R13-2831, 6.4.6.]

7.5. Reporting Requirements

7.5.1. If the permittee is required by the Director to demonstrate compliance with Condition 7.3.3., then the permittee shall submit a testing protocol at least thirty (30) days prior to testing and shall submit a notification of the testing date at least fifteen (15) days prior to testing. The permittee shall submit the testing results within sixty (60) days of testing and provide all supporting calculations and testing data.
[45CSR13, R13-2831, 6.5.1.]

7.5.2. Any deviation(s) of the allowable visible emission requirement for any emission source discovered during observations using 40 C.F.R. Part 60, Appendix A, Method 9 must be reported in writing to the Director of the Division of Air Quality as soon as practicable, but within ten (10) calendar days, of the occurrence and shall include, at a minimum, the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.
[45CSR13, R13-2831, 6.5.2.]

7.5.3. Any deviation(s) from the flare design and/or operation criteria in Condition 7.1.4. shall be reported in writing to the Director as soon as practicable, but within ten (10) calendar days.
[45CSR13, R13-2831, 6.5.3.]

7.5.4. The TEG dehydration unit is located at an area source and meets the criteria in 40 C.F.R. §63.764(e)(1)(ii). Therefore, the permittee is exempt from the reporting requirements for area sources specified in 40 C.F.R. §§63.775(c)(1) through (7).
[45CSR34; 40 C.F.R. §§63.775(c) and (c)(8)]

7.6. Compliance Plan

7.6.1. None.

8.0 Reboilers and Hot Oil Heater [Emission Point IDs: EPRBL-1 to EPRBL-3 and EPOH-1]

8.1. Limitations and Standards

8.1.1. Maximum Design Heat Input. The maximum design heat input for each of the Reboilers (EURBL-01 to EURBL-03) shall not exceed 1.00 mmBTU/hr.
[45CSR13, R13-2831, 7.1.1.]

8.1.2. Maximum Design Heat Input. The maximum design heat input for the Hot Oil Heater (EUOH-01) shall not exceed 3.35 mmBTU/hr.
[45CSR13, R13-2831, 7.1.2.]

8.1.3. 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.
[45CSR13, R13-2831, 7.1.3.; 45CSR§2-3.1.]

8.2. Monitoring Requirements

8.2.1. At such reasonable times as the Secretary may designate, the permittee shall conduct Method 9 emission observations for the purpose of demonstrating compliance with Condition 8.1.3. Method 9 shall be conducted in accordance with 40 C.F.R. Part 60, Appendix A.
[45CSR13, R13-2831, 7.2.1.]

8.3. Testing Requirements

8.3.1. Compliance with the visible emission requirements of Condition 8.1.3. shall be determined in accordance with 40 C.F.R. Part 60, Appendix A, Method 9 or by using measurements from continuous opacity monitoring systems approved by the Director. The Director may require the installation, calibration, maintenance and operation of continuous opacity monitoring systems and may establish policies for the evaluation of continuous opacity monitoring results and the determination of compliance with the visible emission requirements of Condition 8.1.3. Continuous opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control.
[45CSR13, R13-2831, 7.3.1.; 45CSR§2-3.2.]

8.4. Recordkeeping Requirements

8.4.1. The permittee shall maintain records of all monitoring data required by Condition 8.2.1. documenting the date and time of each visible emission check, the emission point or equipment/source identification number, the name or means of identification of the observer, the results of the check(s), whether the visible emissions are normal for the process, and, if applicable, all corrective measures taken or planned. The permittee shall also record the general weather conditions (i.e. sunny, approximately 80°F, 6-10 mph NE wind) during the visual emission check(s). Should a visible emission observation be required to be performed per the requirements specified in Method 9, the data records of each observation shall be maintained per the requirements of Method 9.
[45CSR13, R13-2831, 7.4.1.]

8.5. Reporting Requirements

8.5.1. Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40 C.F.R. Part 60, Appendix A, Method 9 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.
[45CSR13, R13-2831, 7.5.1.]

8.6. Compliance Plan

8.6.1. None.

9.0 Condensate Stabilizer and Storage Tanks [Emission Point IDs: EPSTAB, EPTK-1 through EPTK-10, and EPWTK-11 through EPWTK-12]

9.1. Limitations and Standards

9.1.1. The condensate stabilizer (EUSTAB) overheads will normally be captured by a vapor recovery unit and routed to the facility inlet. However, for operating flexibility and during maintenance activities, the stabilizer overheads may be sent to the flare (APCFLARE) for up to 120 hours per year. This shall be operated in compliance with Condition 7.1.4.
[45CSR13, R13-2831, 8.1.1.]

9.1.2. The maximum combined annual throughput of liquids to the storage tanks shall not exceed the following:

Tank ID	Material Stored	Maximum Annual Throughput (bbl/yr)
EUTK-01 to EUTK-10	Stabilized Condensate	273,750 (aggregate)
EUTK-11 to EUTK-12	Produced Fluid/Water	36,500 (aggregate)

Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the throughput at any given time during the previous twelve consecutive calendar months.

[45CSR13, R13-2831, 8.1.2.]

9.1.3. Maximum emissions from the storage tank battery (EUTK-01 to EUTK-12) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tpy)
Volatile Organic Compounds	0.27	1.21

[45CSR13, R13-2831, 8.1.3.]

9.1.4. *Vapor Recovery Unit (VRU)*

a. The permittee shall operate the VRU and storage tanks as a closed vent system.

b. Vapors from the storage tanks (EUTK-01 to EUTK-12) shall be captured by a vapor recovery unit (VRU) system while any of the respective vessels are in service, which include vessels that are empty but not degassed, and recompress the vapors back into a pipeline segment. The operational availability of the VRU system shall be 98% on a calendar year basis. No component of the closed vent system of the VRU system shall exhibit any detectable emissions.

[45CSR13, R13-2831, 8.1.4.]

9.1.5. The storage tanks (EUTK-01 to EUTK-12) shall be designed and operated as specified in paragraphs a. through c. of this condition.

a. The cover and all openings on the cover (e.g., access hatches, sampling ports, pressure relief valves, and gauge wells) shall form a continuous impermeable barrier over the entire surface area of the liquid in the storage vessel.

b. Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid or cap) whenever material is in the unit on which the cover is installed except during those times when it is necessary to use an opening as follows:

1. To add material to or remove material from the unit (this includes openings necessary to equalize or balance the internal pressure of the unit following changes in the level of the material in the unit);

2. To inspect or sample the material in the unit;

3. To inspect, maintain, repair, or replace equipment located inside the unit; or

4. To vent liquids, gases, or fumes from the unit through a closed-vent system designed and operated in accordance with the requirements of Condition 9.1.4. to a control device.

c. The storage tanks (EUTK-01 to EUTK-12) thief hatch shall be weighted and properly seated. The permittee must select gasket material for the hatch based on composition of the fluid in the storage vessel and weather conditions.

[45CSR13, R13-2831, 8.1.5.]

9.2. Monitoring Requirements

9.2.1. The permittee shall monitor the throughput to the storage tanks (EUTK-01 to EUTK-12) on a monthly basis. **[45CSR13, R13-2831, 8.2.1.]**

9.3. Testing Requirements

9.3.1. None.

9.4. Recordkeeping Requirements

9.4.1. To demonstrate compliance with Condition 9.1.1., the permittee shall maintain a record of the hours the stabilizer overheads were sent to the flare (APCFLARE) on a monthly and rolling twelve-month total. **[45CSR13, R13-2831, 8.3.1.]**

9.4.2. To demonstrate compliance with Conditions 9.1.2. and 9.1.3., the permittee shall maintain a record of the aggregate throughput for the storage tanks on a monthly and rolling twelve-month total. Said records 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.
[45CSR13, R13-2831, 8.3.2.]

9.4.3. To demonstrate compliance with the operational availability requirement of Condition 9.1.4.b., the permittee shall maintain records of any downtime hours associated with the VRU system.
[45CSR§30-5.1.c.]

9.5. Reporting Requirements

9.5.1. None.

9.6. Compliance Plan

9.6.1. None.

10.0 Truck Loading [Emission Point IDs: EPLOR]

10.1. Limitations and Standards

10.1.1. The maximum combined annual throughput of liquids to the storage tanks shall not exceed the following:

Loadout ID	Material Stored	Maximum Annual Throughput (bbl/yr)
LOR	Stabilized Condensate	273,750 (aggregate)
WLOR	Produced Fluid/Water	36,500 (aggregate)

Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the throughput at any given time during the previous twelve consecutive calendar months.

[45CSR13, R13-2831, 9.1.1.]

10.1.2. Maximum emissions from the product loadout rack (EPLOR) shall not exceed the following limits:

Pollutant	Maximum Annual Emissions[1] (tpy)
Volatile Organic Compounds	13.52
Total Hazardous Air Pollutants	0.21

[1] *The VOC and HAP emission limits for EPLOR are based on an overall control efficiency of 66.5%. A capture efficiency of 70% is assumed for tanker trucks that do not pass either the MACT-level annual leak test or the NSPS-level annual leak test. The captured emissions are then controlled by a carbon adsorption system with a 95% control efficiency (see Condition 10.1.3.b.1.). Therefore, the overall control efficiency of VOC and HAP emissions from EPLOR is 66.5% (70% × 95% = 66.5%).*

[45CSR13, R13-2831, 9.1.2.; 45CSR30-5.1.c.]

10.1.3. Truck loading (EPLOR) operations shall be in accordance with the following requirements:

a. All trucks shall be loaded using the submerged-fill method.

b. The permittee shall, at all times when loading operations are occurring, utilize a system of activated carbon canisters (carbon adsorption) to control captured VOC emissions.

1. The carbon adsorption system shall be designed to achieve a 95% minimum guaranteed control efficiency for volatile organic compound (VOC) emissions.

2. The carbon adsorption system must be operated at all times when gases, vapors, and fumes are vented to it. Carbon canisters shall be operated in series as dual carbon canisters, in case of emission breakthrough in one carbon canister.

3. The carbon adsorption system must have a commercially manufactured saturation indicator installed.

4. Prior to the loading of each truck, the saturation indicator on the carbon adsorption system shall be checked to ensure that the carbon is not spent. These records must be kept in accordance with Condition 3.4.2. If the saturation indicator demonstrates that the carbon is saturated, truck loading is prohibited and/or emissions are to cease.

5. All carbon in the carbon canister shall be replaced with fresh carbon or the carbon canister replaced with a new canister when the saturation indicator changes in color and indicates saturation.

6. Fresh replacements for all carbon being used in the carbon adsorption system shall be kept on-site.

[45CSR13, R13-2831, 9.1.3.]

10.1.4. The truck loading shall be operated in accordance with the plans and specifications filed in Permit Application R13-2831F.
[45CSR13, R13-2831, 9.1.4.]

10.2. Monitoring Requirements

10.2.1. The permittee shall monitor the throughput to the truck loading (EPLOR) on a monthly basis.
[45CSR13, R13-2831, 9.2.1.]

10.3. Testing Requirements

10.3.1. None.

10.4. Recordkeeping Requirements

10.4.1. All records required under Section 10.4. shall be kept in accordance with Condition 3.4.2.
[45CSR13, R13-2831, 9.3.1.]

10.4.2. To demonstrate compliance with Conditions 10.1.1. and 10.1.2., the permittee shall maintain a record of the aggregate throughput for the truck loading (EPLOR) on a monthly and rolling twelve-month total.
[45CSR13, R13-2831, 9.3.2.]

10.5. Reporting Requirements

10.5.1. None.

10.6. Compliance Plan

10.6.1. None.

11.0 Compressor Blowdowns, Engine Startups, and Pigging Operations [Emission Point IDs: EPBD, EPESU, and EPPIG]

11.1. Limitations and Standards

11.1.1. The maximum number of compressor blowdown events per year shall not exceed 572, with an estimated total of 3.97 mmscf per year. Compliance shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the compressor blowdown events at any given time during the previous twelve consecutive calendar months.
[45CSR13, R13-2831, 10.1.1.]

11.1.2. The maximum number of engine startup events per year shall not exceed 2,288, with an estimated total of 1.65 mmscf per year. Compliance shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the engine startup events at any given time during the previous twelve consecutive calendar months.
[45CSR13, R13-2831, 10.1.2.]

11.1.3. The maximum number of emergency plant shutdown tests per year shall not exceed 2, with an estimated total of 0.46 mmscf per year. Compliance shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the emergency plant shutdown events at any given time during the previous twelve consecutive calendar months.
[45CSR13, R13-2831, 10.1.3.]

11.1.4. The maximum number of pigging events per year shall not exceed 624, with an estimated total of 152,776 scf per year. Compliance shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the pigging events at any given time during the previous twelve consecutive calendar months.
[45CSR13, R13-2831, 10.1.4.]

11.2. Monitoring Requirements

11.2.1. None.

11.3. Testing Requirements

11.3.1. None.

11.4. Recordkeeping Requirements

11.4.1. All records required under Section 11.4. of this operating permit shall be kept in accordance with Condition 3.4.2.
[45CSR13, R13-2831, 10.2.1.]

11.4.2. To demonstrate compliance with Conditions 11.1.1. through 11.1.4., the permittee shall maintain a record of the blowdown, startup, emergency plant shutdown, and pigging events and estimated volume per event (scf) on a monthly and rolling twelve-month total.
[45CSR13, R13-2831, 10.2.2.]

11.5. Reporting Requirements

11.5.1. Any exceedance of Conditions 11.1.1. through 11.1.4. must be reported in writing to the Director of the DAQ as soon as practicable, but within ten (10) calendar days, of the occurrence and shall include, at a minimum, the following information: the date of the exceedance, the estimate of VOC emissions released to the atmosphere as a result of the exceedance and any corrective measures taken or planned.
[45CSR13, R13-2831, 10.3.1.]

11.6. Compliance Plan

11.6.1. None.

West Virginia Department of Environmental Protection
Division of Air Quality

Fact Sheet

For Draft/Proposed Permitting Action Under 45CSR30 and Title V of the Clean Air Act

Permit Number: **R30-05100130-2024**
Application Received: **December 19, 2023**
Plant Identification Number: **03-54-051-00130**
Permittee: **Appalachia Midstream Services, L.L.C.**
Facility Name: **Miller Compressor Station**
Mailing Address: **100 Teletech Drive, Suite 2, Moundsville, WV 26041**

Physical Location:	Bannen, Marshall County, West Virginia
UTM Coordinates:	532.49 km Easting • 4,396.919 km Northing • Zone 17
Directions:	From New Martinsville, head north on Energy Highway (WV-Route 2) for approximately 4.6 miles. Turn right onto Proctor Creek Road and travel for 9.3 miles. Take a sharp left to stay on Proctor Creek Road and continue traveling for approximately 6.9 miles. Turn left onto Johnson Ridge (County Route 1/22) and continue for approximately 1.8 miles. Take a slight right to the compressor station.

Facility Description

The Miller Compressor Station receives low-pressure "wet" natural gas from local production wells via pipeline. The gas is compressed and dehydrated for delivery of high pressure "dry" natural gas via pipeline. Raw condensate and produced fluid/water are also stabilized at the facility before being sent off-site via tanker trucks.

NAICS: 213112, SIC: 1389

Emissions Summary

Plantwide Emissions Summary [Tons per Year]

Regulated Pollutants	Potential Emissions	2023 Actual Emissions
Carbon Monoxide (CO)	101.30	26.18
Nitrogen Oxides (NO_X)	77.61	42.93
Particulate Matter ($PM_{2.5}$)	9.44	8.05
Particulate Matter (PM_{10})	9.44	8.05
Total Particulate Matter (TSP)	9.44	8.05
Sulfur Dioxide (SO_2)	0.44	0.39
Volatile Organic Compounds (VOC)	131.21	36.44

PM_{10} is a component of TSP.

Hazardous Air Pollutants	Potential Emissions	2023 Actual Emissions
Acetaldehyde	1.62	1.43
Acrolein	1.07	0.91
Benzene	1.00	0.22
1,3-Butadiene	0.10	0.06
Ethylbenzene	0.36	0.18
Formaldehyde	9.26	2.31
n-Hexane	2.23	0.72
Methanol	2.46	0.94
Polycyclic Organic Matter	0.09	0.07
Toluene	1.20	0.24
2,2,4-Trimethylpentane	0.26	0.15
Xylenes	3.25	0.25
Other HAPs	0.07	None Reported
Total HAPs	22.97	7.48

Some of the above HAPs may be counted as PM or VOCs.

Title V Program Applicability Basis

This facility has the potential to emit 101.30 tpy of Carbon Monoxide and 131.21 tpy of Volatile Organic Compounds. Due to this facility's potential to emit over 100 tons per year of criteria pollutant, Appalachia Midstream Services, L.L.C. is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

Legal and Factual Basis for Permit Conditions

The State and Federally-enforceable conditions of the Title V Operating Permits are based upon the requirements of the State of West Virginia Operating Permit Rule 45CSR30 for the purposes of Title V of the Federal Clean Air Act and the underlying applicable requirements in other state and federal rules.

This facility has been found to be subject to the following applicable rules:

Federal and State:	45CSR2	To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers.
	45CSR6	Control of Air Pollution from Combustion of Refuse.
	45CSR11	Standby plans for emergency episodes.
	45CSR13	Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation.
	45CSR16	Standards of Performance for New Stationary Sources.
	WV Code § 22-5-4 (a) (14)	The Secretary can request any pertinent information such as annual emission inventory reporting.
	45CSR30	Requirements for Operating Permits.
	45CSR34	Emission Standards for Hazardous Air Pollutants.
	40 C.F.R. Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.
	40 C.F.R. Part 60 Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After August 23, 2011, and On or Before September 18, 2015.
	40 C.F.R. Part 60 Subpart OOOOa	Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After September 18, 2015, and On or Before December 6, 2022.
	40 C.F.R. Part 61	Asbestos inspection and removal.
	40 C.F.R. Part 63 Subpart HH	National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities.
	40 C.F.R. Part 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.
	40 C.F.R. Part 82 Subpart F	Ozone depleting substances.
State Only:	45CSR4	No objectionable odors.
	45CSR17	To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter.

Each State and Federally-enforceable condition of the Title V Operating Permit references the specific relevant requirements of 45CSR30 or the applicable requirement upon which it is based. Any condition of the Title V permit that is enforceable by the State but is not Federally-enforceable is identified in the Title V permit as such.

The Secretary's authority to require standards under 40 C.F.R. Part 60 (NSPS), 40 C.F.R. Part 61 (NESHAPs), and 40 C.F.R. Part 63 (NESHAPs MACT) is provided in West Virginia Code §§ 22-5-1 *et seq.*, 45CSR16, 45CSR34 and 45CSR30.

Active Permits/Consent Orders

Permit or Consent Order Number	Date of Issuance
R13-2831G	January 16, 2024

Conditions from this facility's Rule 13 permit(s) governing construction-related specifications and timing requirements will not be included in the Title V Operating Permit but will remain independently enforceable under the applicable Rule 13 permit(s). All other conditions from this facility's Rule 13 permit(s) governing the source's operation and compliance have been incorporated into this Title V permit in accordance with the "General Requirement Comparison Table," which may be downloaded from DAQ's website.

Determinations and Justifications

Appalachia Midstream Services, L.L.C.'s Miller Compressor Station is an existing facility that was initially permitted under the NSR Permit R13-2831. With the issuance of R13-2831F, the facility became subject to Title V due to a potential to emit over 100 tpy of carbon monoxide and volatile organic compounds. The NSR permit has since been revised under the Modification Permit R13-2831G which was issued on January 16, 2024.

This section outlines the applicable requirements that have been included in the initial Title V operating permit.

Section 3.0. – Facility-Wide Requirements

The following conditions were added to Section 3.0.:

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
3.1.8.	A Risk Management Plan (RMP) is required if the permittee becomes subject to Part 68. Part 68 is currently inapplicable to the Miller Compressor Station as prior to entry into a natural gas processing plant, regulated substances in naturally occurring hydrocarbon mixtures (including condensate, field gas, and produced water) are not considered when determining whether more than a threshold quantity is present at a stationary source, per 40 C.F.R. §68.115(b)(2)(iii).	40 C.F.R. 68	N/A
3.1.9.	Facility-wide HAP emissions are limited to ensure the facility remains a minor source of HAPs.	45CSR13	4.1.2.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
3.1.10.	Operation and Maintenance of Air Pollution Control Equipment.	45CSR13	4.1.3. and 6.1.8.
3.1.11.	Only the permitted emission units and *de minimis* sources are authorized at the facility.	45CSR13	4.1.5.
3.1.12.	Fugitive particulate matter may not be discharged beyond the boundary lines of the facility.	4CSR§17-3.1.	N/A
3.4.1.	Record of Monitoring Information.	45CSR13 45CSR§30-5.1.c.2.A	4.1.1.
3.4.2.	Retention of Records.	45CSR13	3.4.1.
3.4.4.	Record of Malfunctions of Air Pollution Control Equipment.	45CSR13	4.1.4.

Section 4.0. – Compressor Engines and Microturbine

The Miller Compressor Station operates eleven spark ignition (SI) reciprocating internal combustion engines (RICEs) (Emission Units: EUCE-2a, EUCE-3, EUCE-4a, EUCE-5 to EUCE-8, and EUCE-12 to EUCE-15) to drive the natural gas compressors. The engines are fueled by raw natural gas.

1. EUCE-2a and EUCE-4a are Waukesha L7044 GSI engines with a maximum power rating of 1,900 HP. Non-selective catalytic reduction (NSCR) control devices are used with each engine to control emissions of nitrogen oxides with an efficiency of 97.4%, carbon monoxide with an efficiency of 93.9%, volatile organic compounds with an efficiency of 86.7%, and formaldehyde with an efficiency of 76.0%.

2. EUCE-3, EUCE-5, and EUCE-6 are Waukesha L5794 GSI engines with a maximum power rating of 1,380 HP. NSCR control devices are used with each engine to control emissions of nitrogen oxides with an efficiency of 96.5%, carbon monoxide with an efficiency of 93.3%, volatile organic compounds with an efficiency of 84.5%, and formaldehyde with an efficiency of 84.5%.

3. EUCE-7, EUCE-8, and EUCE-12 to EUCE-15 are CAT G3516B engines with a maximum power rating of 1,380 HP. Oxidation catalyst (OxCat) control devices are used with each engine to control emissions of carbon monoxide with an efficiency of 81.5%, volatile organic compounds with an efficiency of 59.3%, and formaldehyde with an efficiency of 76.0%.

The RICEs are subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

2. **45CSR16** – *Standards of Performance for New Stationary Sources*

3. **40 C.F.R. Part 60 Subpart JJJJ** – *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*

   Construction of each of the engines commenced after June 12, 2006; the manufacture date of each engine is after July 01, 2007; and the maximum engine power of each engine is greater than 500 HP (with the maximum

engine power of each lean burn SI ICE being greater than 1,350 HP). Therefore, the compressor engines are subject to Subpart JJJJ per 40 C.F.R. §§60.4230(a)(4) and (a)(4)(i).

EUCE-2a, EUCE-3, EUCE-4a, EUCE-5, and EUCE-6 are non-emergency, 4-stroke rich burn (4SRB) RICEs, and EUCE-7, EUCE-8, EUCE-12, EUCE-13, EUCE-14, and EUCE-15 are non-emergency, 4-stroke lean burn (4SLB) RICEs. As stationary SI ICEs with a maximum engine power greater than 100 HP, each of the compressor engines must comply with the emission standards for NO_X, CO, and VOCs specified in Table 1 to Subpart JJJJ of Part 60, in accordance with §60.4233(e).

The engines are not certified under Subpart JJJJ. Therefore, compliance with the emission standards is demonstrated through periodic performance tests as specified in §60.4244 as well as through the reporting and recordkeeping requirements of §60.4245.

4. **45CSR34** – *Emission Standards for Hazardous Air Pollutants*

5. **40 C.F.R. Part 63 Subpart ZZZZ** – *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Combustion Engines*

   According to 40 C.F.R. §63.6590(a)(2)(iii), EUCE-2a, EUCE-3, EUCE-4a, EUCE-5 to EUCE-8, and EUCE-12 to EUCE-15 are considered new stationary RICEs as construction of the engines commenced after June 12, 2006 and the engines are located at an area source of HAPs. Per §§63.6590(c) and (c)(1), these engines demonstrate compliance with the requirements of Subpart ZZZZ through compliance with the requirements of Part 60 Subpart JJJJ.

To generate electric power for equipment, the Miller Compressor Station also operates one Capstone C600 microturbine generator (Emission Unit: EUGEN-1, Emission Point: EPGEN-1) which is comprised of three 200kWhe turbine generators that operate in parallel. The microturbine has an engine power of 805 HP, has a fuel flow HHV of 6.84 mmBTU/hr, and combusts natural gas. Emissions from the microturbine are vented to the atmosphere.

The microturbine generator is subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

The table below describes each condition added to Section 4.0. of the Title V operating permit:

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
4.1.1.	Emission limitations for NO_X, CO, VOCs, and Formaldehyde from the compressor engines. Compliance with these limits is demonstrated through the performance testing requirements of 40 C.F.R. §60.4244 which was included in the operating permit under Condition 4.3.1.	45CSR13	5.1.1.
4.1.2.	Emission limits for NO_X, CO, VOCs, and Formaldehyde from the microturbine generator. The annual emission limits are based on 8,760 hours of operation.	45CSR13	5.1.2.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
4.1.3.	Emission limitations of Conditions 4.1.1. and 4.1.2. apply at all times except periods of start-up and shutdown.	45CSR13	5.1.3.
4.1.4.	Aggregate engine crankcase emission limitations for NO_X, CO, VOCs, and Formaldehyde.	45CSR13	5.1.4.
4.1.5.	Requirements for use of catalytic reduction devices to control emissions from the RICEs.	45CSR13	5.1.5.
4.1.6.	Applicability of 40 C.F.R. Part 60 Subpart JJJJ to the engines EUCE-2a, EUCE-3, EUCE-4a, EUCE-5 to EUCE-8, and EUCE-12 to EUCE-15.	45CSR13 45CSR16 40 C.F.R. §§60.4230(a), (a)(4), (a)(4)(i), and (a)(5)	11.1.1.
4.1.7.	The emission standards of Table 1 to 40 C.F.R. Part 60 Subpart JJJJ which apply to non-emergency SI engines that are fueled by natural gas, have a maximum engine power greater than or equal to 500 HP, and were manufactured after July 1, 2010.	45CSR13 45CSR16 40 C.F.R. §60.4233(e) Table 1 to Subpart JJJJ of Part 60	11.1.2.
4.1.8.	The engines shall be operated and maintained to achieve the emission standards of 40 C.F.R. §60.4233(e) and Condition 4.1.7. over the life of the engine.	45CSR13 45CSR16 40 C.F.R. §60.4234	11.1.3.
4.1.9.	Deadlines for installing stationary SI ICE with a maximum engine power greater than or equal to 500 HP that do not meet the requirements in 40 C.F.R. §60.4233.	45CSR13 45CSR16 40 C.F.R. §60.4236(b)	11.2.1.
4.1.10.	The requirements of 40 C.F.R. §60.4236 do not apply to SI ICE that have been modified or reconstructed or that have been reinstalled at a new location.	45CSR13 45CSR16 40 C.F.R. §60.4236(e)	11.2.2.
4.1.11.	Propane may be used as an alternative fuel during emergency operations for up to 100 hours.	45CSR16 40 C.F.R. §60.4243(e)	N/A
4.1.12.	An air-to-fuel ratio controller must be used with the operation of three-way catalysts/non-selective catalytic reduction.	45CSR16 40 C.F.R. §60.4243(g)	N/A

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
4.1.13.	For a new or reconstructed RICE located at an area source of HAPs, compliance with 40 C.F.R. Part 63 Subpart ZZZZ must be demonstrated upon startup of the RICE. NOTE: The NSR permit condition contains the date by which an existing SI RICE at an area source of HAPs must be in compliance with the applicable provisions of Subpart ZZZZ, per §63.6595(a)(1). This requirement is inapplicable to the engines at the compressor station which are considered new or reconstructed RICEs at an area source under Subpart ZZZZ and has been replaced with the requirement of §63.6595(a)(7).	45CSR13 45CSR34 40 C.F.R. §63.6595(a)(7)	12.1.1.
4.1.14.	Compliance with 40 C.F.R. Part 63 Subpart ZZZZ is demonstrated through compliance with 40 C.F.R. Part 60 Subpart JJJJ.	45CSR13 45CSR34 40 C.F.R. §§63.6590(c) and (c)(1)	12.1.2.
4.1.15.	VOC emission limits for aggregate rod packing emissions from the engines EUCE-2a, EUCE-3, EUCE-4a, EUCE-5 to EUCE-8, and EUCE-12 to EUCE-15.	45CSR13	13.1.1.
4.2.1.	Monitoring and maintenance requirements for catalytic oxidizer control devices.	45CSR13	5.2.1.
4.2.2.	Compliance demonstration requirements for non-certified stationary SI ICEs. A performance test of each engine must be completed every 8,760 hours or 3 years, whichever comes first.	45CSR13 45CSR16 40 C.F.R. §§60.4243(b), (b)(2), and (b)(2)(ii)	11.3.1.
4.3.1.	Procedures for performance tests conducted in accordance with 40 C.F.R. Part 60 Subpart JJJJ.	45CSR13 45CSR16 40 C.F.R. §60.4244	5.3.1. and 11.4.1.
4.4.1.	Maintain records of maintenance performed on each engine to demonstrate compliance with Condition 4.1.5.	45CSR13	5.4.1.
4.4.2.	Maintain records of maintenance performed on each catalytic reduction device to demonstrate compliance with Condition 4.2.1.	45CSR13	5.4.2.
4.4.3.	Maintain a copy of the site-specific maintenance plan or the manufacturer maintenance plan.	45CSR13	5.4.3.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
4.4.4.	Maintain the records of Conditions 4.4.1. to 4.4.3. in accordance with the requirements for the Retention of Records in Condition 3.4.2.	45CSR13	5.4.4.
4.4.5.	Recordkeeping requirements from 40 C.F.R. Part 60 Subpart JJJJ that are applicable to uncertified engines.	45CSR13 45CSR16 40 C.F.R. §§60.4245(a), (a)(1), (a)(2), and (a)(4)	11.5.1.a.
4.5.1.	Initial notification requirements for SI ICE with a rating greater than or equal to 500 HP that have not been certified to meet the emission standards of 40 C.F.R. §60.4231.	45CSR13 45CSR16 40 C.F.R. §60.4245(c)	11.5.1.c.
4.5.2.	40 C.F.R. Part 60 Subpart JJJJ reporting requirements for each performance test conducted according to Condition 4.3.1.	45CSR13 45CSR16 40 C.F.R. §60.4245(d)	11.5.1.d.

NOTE: Conditions 11.3.1.a. and 11.5.1.a.3. of R13-2831G have not been included in the operating permit. Condition 11.3.1.a. contains the requirement of 40 C.F.R. §60.4243(b)(1), and Condition 11.5.1.a.3. contains the requirement of §60.4245(a)(3). Both of these conditions are applicable to engines that are certified under 40 C.F.R. Part 60 Subpart JJJJ by the manufacturer. However, as all of the engines at the Miller Compressor Station are non-certified, these requirements are inapplicable.

Sections 5.0. and 6.0. – 40 C.F.R. Part 60 Subparts OOOO and OOOOa Requirements

Sections 5.0. and 6.0. contain the applicable requirements from the NSPS regulating greenhouse gas (GHG), volatile organic compound (VOC), and sulfur dioxide (SO_2) emissions from facilities in the Crude Oil and Natural Gas source category. These standards include:

1. Subpart OOOO which contains the standards for the control of VOC and SO_2 from the affected facilities, located at a natural gas facility, that commenced construction, modification, or reconstruction after August 23, 2011, and on or before September 18, 2015.

2. Subpart OOOOa which contains the standards for the control of VOC, SO_2, and GHG emissions from affected facilities in the natural gas source category that commenced construction, modification, or reconstruction after September 18, 2015, and on or before December 6, 2022.

3. Subpart OOOOb which contains the standards for the control of VOC, SO_2, and GHG emissions from affected facilities in the natural gas source category that commenced construction, modification, or reconstruction after December 6, 2022. At the time of writing this permit, no equipment located at the Miller Compressor Station is subject to this rule.

Potential affected facilities at the Miller Compressor Station include the following:

1. Reciprocating Compressors under §60.5365(c) and §60.5365a(c):

   The engines EUCE-3, EUCE-5, and EUCE-6 were constructed prior to the applicability dates of each of the rules. Therefore, these reciprocating compressors are not subject to Subparts OOOO or OOOOa.

   The engines EUCE-7 and EUCE-8 were constructed within the applicability dates of Subpart OOOO and are located prior to the point of custody transfer as defined in §60.5430. Therefore, the reciprocating compressors associated with these engines are subject to Subpart OOOO.

   The engines EUCE-12 to EUCE-15 were constructed within the applicability dates of Subpart OOOOa. Therefore, the reciprocating compressors associated with these engines are subject to Subpart OOOOa.

   Under 40 C.F.R. §60.2, commenced means "that an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification". Although the engines EUCE-2a and EUCE-4a were installed at the facility in 2023, the permittee has stated that modification of EUCE-2a and EUCE-4a commenced prior to the Subpart OOOOb applicability date of December 6, 2022 due to purchase orders with the manufacturer for the engines dated October 2022. Therefore, the reciprocating compressors driven by EUCE-2a and EUCE-4a are also subject to Subpart OOOOa.

   The requirements applicable to the reciprocating compressors associated with EUCE-2a, EUCE-4a, EUCE-7, EUCE-8, and EUCE-12 to EUCE-15 have been included in Section 5.0. of this operating permit.

2. Pneumatic Controllers under §60.5365(d)(2) and §60.5365a(d)(1):

   A pneumatic controller that is not located at a natural gas processing plant is considered an affected facility under Subpart OOOO or OOOOa only if the unit is natural gas-driven and operates at a natural gas bleed rate greater than 6 scfh. The pneumatic controllers located at the Miller Compressor Station were either constructed outside the applicability dates of these subparts, are compressed air-driven, or have a bleed rate less than or equal to 6 scfh. Therefore, the Miller Compressor Station is not subject to the standards for pneumatic controllers under Subpart OOOO or OOOOa.

3. Storage Vessels under §60.5365(e) and §60.5365a(e):

   The stabilized condensate storage tanks EUTK-1 to EUTK-10 and the produced water storage tanks EUTK-11 and EUTK-12 were installed at the Miller Compressor Station in 2010. Therefore, the storage tanks were installed prior to the applicability dates of the subparts and are not subject to the requirements of Subparts OOOO and OOOOa.

4. Fugitive Emissions Components under §60.5365a(j):

   The collection of fugitive emissions components at a compressor station is an affected facility under Subpart OOOOa. For the purposes of §60.5397a, a modification to a compressor station occurs when either an additional compressor is installed at the compressor station or one or more compressors at a compressor station is replaced by one or more compressors of greater total horsepower. The compressor engines EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15 were constructed within the applicability dates of Subpart OOOOa.

   The compressor engines EUCE-12 to EUCE-15 replaced four compressor engines with the same total horsepower. Therefore, the construction of EUCE-12 to EUCE-15 was not considered a modification of the

compressor station under §60.5365a(j) and did not trigger the Subpart OOOOa requirements for the collection of fugitive emissions components.

The compressor engines EUCE-2a and EUCE-4a replaced two compressor engines with a smaller total horsepower. Therefore, the construction of EUCE-2a and EUCE-4a is considered a modification of the compressor station under §60.5365a(j), and the collection of fugitive emissions components at the Miller Compressor Station are subject to Subpart OOOOa. The applicable requirements have been included in Section 6.0. of this operating permit.

Section 5.0. – 40 C.F.R. Part 60 Subparts OOOO and OOOOa Requirements for the Reciprocating Compressors Associated with EUCE-2a, EUCE-4a, EUCE-7, EUCE-8, and EUCE-12 to EUCE-15

The reciprocating compressors associated with the engines EUCE-2a, EUCE-4a, EUCE-7, EUCE-8, and EUCE-12 to EUCE-15 are subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

2. **45CSR16** – *Standards of Performance for New Stationary Sources*

3. **40 C.F.R. Part 60 Subpart OOOO** – *Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced After August 23, 2011, and On or Before September 18, 2015* (EUCE-7 and EUCE-8)

4. **40 C.F.R. Part 60 Subpart OOOOa** – *Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced After September 18, 2015 and On or Before December 6, 2022* (EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15)

The table below describes each condition added to Section 5.0. of the Title V operating permit:

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
5.1.1.	Affected facilities under Subparts OOOO and OOOOa must be operated in a manner consistent with good air pollution control practice for minimizing emissions.	45CSR16 40 C.F.R. §60.5370(b) 40 C.F.R. §60.5370a(b)	N/A
5.1.2.	Subpart OOOO applicable standards for reciprocating compressor affected facilities associated with EUCE-7 and EUCE-8.	45CSR13 45CSR16 40 C.F.R. §60.5385	13.1.2.
5.1.3.	Subpart OOOOa applicable standards for reciprocating compressor affected facilities associated with EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15.	45CSR13 45CSR16 40 C.F.R. §60.5385a	13.1.3.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
5.2.1.	Requirements to demonstrate initial compliance with Subpart OOOO for the reciprocating compressors associated with EUCE-7 and EUCE-8.	45CSR13 45CSR16 40 C.F.R. §60.5410(c)	13.2.1.
5.2.2.	Requirements to demonstrate continuous compliance with Subpart OOOO for the reciprocating compressors associated with EUCE-7 and EUCE-8.	45CSR13 45CSR16 40 C.F.R. §60.5415(c)	13.3.1.
5.2.3.	Requirements to demonstrate initial compliance with Subpart OOOOa for the reciprocating compressors associated with EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15.	45CSR13 45CSR16 40 C.F.R. §60.5410a(c)	13.2.2.
5.2.4.	Requirements to demonstrate continuous compliance with Subpart OOOOa for the reciprocating compressors associated with EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15.	45CSR13 45CSR16 40 C.F.R. §60.5415a(c)	13.3.2.
5.4.1.	Applicable Subpart OOOO recordkeeping requirements for the reciprocating compressors associated with EUCE-7 and EUCE-8.	45CSR16 40 C.F.R. §§60.5420(c), (c)(3), and (c)(6) to (c)(9)	N/A
5.4.2.	Applicable Subpart OOOOa recordkeeping requirements for the reciprocating compressors associated with EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15.	45CSR13 45CSR16 40 C.F.R. §§60.5420a(c), (c)(3), (c)(6) to (c)(8), and (c)(17)	13.4.6.
5.5.1.	Applicable Subpart OOOO reporting requirements for the reciprocating compressors associated with EUCE-7 and EUCE-8. Conditions 13.4.3. and 13.4.5. of R13-2831G both contain the reporting requirements of §§60.5420(b)(1) and (b)(4). Condition 13.4.5.v. references Condition 4.4.4. which was included in a previous NSR permit with the Subpart OOOO requirements for reciprocating compressors but was not carried forward to the current NSR permit.	45CSR13 45CSR16 40 C.F.R. §§60.5420(b), (b)(1), and (b)(4)	13.4.3. and 13.4.5.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
5.5.2.	Applicable Subpart OOOOa reporting requirements for the reciprocating compressors associated with EUCE-2a, EUCE-4a, and EUCE-12 to EUCE-15.	45CSR13 45CSR16 40 C.F.R. §§60.5420a(b), (b)(1), (b)(4), (b)(11), and (b)(12)	13.4.4. and 13.4.6.

NOTE: Conditions 13.4.1. and 13.4.2. of R13-2831G have not been included in this operating permit. These conditions require the permittee to submit the notifications specified in §§60.5420(a)(1) and (2) and §§60.5420a(a)(1) and (2). However, §60.5420(a)(1) does not require the notifications of §§60.7(a)(1), (a)(3), and (a)(4) for reciprocating compressors; §60.5420a(a)(1) does not require the notifications of §§60.7(a)(1), (a)(3), and (a)(4) and §60.15(d) for reciprocating compressors; and the notifications of §60.5420(a)(2) and §60.5420a(a)(2) are applicable to well affected facilities.

Section 6.0. – 40 C.F.R. Part 60 Subpart OOOOa Requirements for Fugitive Emissions Components

Under §60.5430a, a fugitive emissions component is defined as "any component that has the potential to emit fugitive emissions of methane or VOC at a compressor station, including valves, connectors, pressure relief devices, open-ended lines, flanges, covers and closed vent systems not subject to §60.5411 or §60.5411a, thief hatches or other openings on a controlled storage vessel not subject to §60.5395 or §60.5395a, compressors, instruments, and meters. Devices that vent as part of normal operations such as natural gas-driven pneumatic controllers or natural gas-driven pumps, are not fugitive emissions components, insofar as the natural gas discharged from the device's vent is not considered a fugitive emission. Emissions originating from other than the device's vent, such as the thief hatch on a controlled storage vessel, would be considered fugitive emissions."

As the Miller Compressor Station has been modified as described in §60.5365a(j)(2) within the applicability dates of Subpart OOOOa, the collection of fugitive emissions components is subject to the standards of §60.5397a. The table below describes each condition added to Section 6.0. of the Title V operating permit:

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
6.1.1.	Affected facilities under Subpart OOOOa must be operated in a manner consistent with good air pollution control practice for minimizing emissions.	45CSR16 40 C.F.R. §60.5370a(b)	N/A
6.1.2.	GHG and VOC standards for fugitive emissions components affected facilities.	45CSR13 45CSR16 40 C.F.R. §§60.5397a(a) to (e), (f)(2), (g), (g)(2) to (g)(4), and (h) to (j)	14.1.1.
6.2.1.	Initial compliance demonstration requirements for the collection of fugitive emissions components.	45CSR16 40 C.F.R. §60.5410a(j)	N/A

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
6.2.2.	Continuous compliance demonstration requirements for the collection of fugitive emissions components.	45CSR16 40 C.F.R. §60.5415a(h)	N/A
6.4.1.	Recordkeeping requirements for the collection of fugitive emissions components.	45CSR16 40 C.F.R. §§60.5420a(c), (c)(15), and (c)(15)(i), (vi) to (ix)	N/A
6.5.1.	Reporting requirements for the collection of fugitive emissions components.	45CSR16 40 C.F.R. §§60.5420a(b), (b)(1), (b)(7), (b)(7)(i)(A), (b)(7)(i)(B), (b)(7)(ii) to (iv), and (b)(11)	N/A

Section 7.0. – Natural Gas Dehydration Units

Three triethylene glycol (TEG) dehydration units are operated at the facility to remove water vapor from the natural gas inlet stream. Each dehydrator is comprised of a contactor/absorber tower (no vented emissions), a flash tank (Emission Units: EUDFT-1 to EUDFT-3), and a regenerator/still vent (Emission Units: EUDSV-1 to EUDSV-3) with a condenser. Each dehydration unit is also associated with a reboiler (Emission Units: EURBL-1 to EURBL-3), which have applicable requirements in Section 8.0. of this operating permit.

In the dehydration process, the inlet wet gas stream flows through a contactor tower where the gas is contacted with lean glycol. The lean glycol absorbs the water in the gas stream and becomes rich glycol ladened with water and trace amounts of hydrocarbons. The rich glycol is routed to a flash tank where the pressure is reduced to liberate the lighter hydrocarbons, primarily methane, and then to the regenerator/still where it is heated to drive off the water vapor and any remaining hydrocarbons. The lean glycol is then recirculated through the contactor tower to absorb the water in the gas stream.

The regenerator/still overhead gases are processed through a condenser (Control Device: APCCOND-1 to APCCOND-3). The condensed liquids (primarily water) are routed to the produced fluid/water storage tanks (Emission Units: EUTK-11 and -12). The condenser overhead gases are routed to the reboilers for fuel. The condenser controls VOC and HAP emissions from the still vents with a control efficiency of 95%.

The lighter hydrocarbons from the flash tanks are routed to the dehydrator/stabilizer flare (Control Device: APCFLARE). Overheads from the condensate stabilizer may also be sent to the flare for up to 120 hours per year (see Section 9.0. of this Fact Sheet). The flare has a 98% control efficiency for VOC and HAP emissions from these processes.

The TEG dehydration units, condensers, and flares are subject to the following regulations:

1. **45CSR6** – *Control of Air Pollution from Combustion of Refuse*

   This rule establishes standards to control the particulate matter emissions from the combustion of refuse. Under 45CSR§6-2.8., incineration is defined as "the destruction of combustible refuse by burning in a furnace designed for that purpose. For the purposes of this rule, the destruction of any combustible liquid or gaseous

material by burning in a flare or flare stack, thermal oxidizer, or thermal catalytic oxidizer stack shall be considered incineration". As APCFLARE combusts waste vapors from the flash tanks and condensate stabilizer, the emission standards of 45CSR§6-4 are applicable.

a. Per 45CSR§6-4.1., the PM emission limits for each unit are established using the following formula:

$$F \times Incinerator\ Capacity\ (tons/hr) = Emissions\ (lbs/hr)$$

The maximum rate at which the gas/waste gas is routed to the flare is 770 lbs/hr (0.385 tons/hr). Since the incinerator capacity of the flare is less than 15,000 lbs/hr, the factor F is 5.43 in accordance with Table I of 45CSR§6-4.1.

The PM emission limit of each thermal oxidizer is:

$$5.43 \times 0.385\ tons/hr = 2.09\ lbs/hr$$

The flare has the potential-to-emit particulate matter (PM) at a maximum rate of 0.15 lbs/hr and an average rate of 0.04 lbs/hr. Therefore, as the limit established above is much greater than the maximum potential emissions from the flare, compliance should be demonstrated through the NSR permit requirements to route vapors to the flare at all times (Condition 7.1.4.a.), to operate the flare with a flame present (Condition 7.1.4.b.), and to continuously monitor for the presence of a pilot flame (Condition 7.2.1.).

b. Although the facility is located in Marshall County, 45CSR§6-4.2. is inapplicable to APCFLARE because flares are exempt from the requirement.

c. The flare must also meet the 20% opacity limit of 45CSR§6-4.3., except as specified in 45CSR§6-4.4. Compliance with the requirements should be demonstrated by operating the flare with a flame present at all times (Condition 7.1.4.b.), by operating the units with no visible emissions except for periods not to exceed five minutes in any two-hour period (Condition 7.1.4.e.), and by conducting a Method 22 opacity test (Condition 7.3.1.).

d. The flare is also subject to the standards in 45CSR§§6-4.5. and -4.6. which prohibit the emission of unburned refuse and require the prevention of objectionable odors from the combustor, respectively.

e. At the discretion of the Secretary, the permittee may also be required to conduct stack testing to determine particulate matter loading in accordance with 45CSR§§6-7.1. and -7.2.

2. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

3. **45CSR34** – *Emission Standards for Hazardous Air Pollutants*

4. **40 C.F.R. Part 63 Subpart HH** – *National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities*

Subpart HH of the NESHAP is applicable to facilities in the oil and natural gas production source category, which includes compressor stations that transport natural gas prior to a natural gas processing plant or the point of custody transfer. As the Miller Compressor Station is located prior to this point, the compressor station is a "production field facility" subject to Subpart HH.

Per the definition of a major source in 40 C.F.R. §63.761, the major source determination for production field facilities is determined by aggregating HAP emissions from only the glycol dehydration units and the storage vessels. The potential-to-emit of these units are below major source thresholds. Therefore, the Miller Compressor Station is an area source of HAPs under this subpart, and, per 40 C.F.R. §63.760(b)(2), the TEG dehydration unit is the only affected source subject to Subpart HH.

Provided that the actual average benzene emissions from each TEG dehydration unit remain less than 1 tpy, 40 C.F.R. §§63.764(e)(1) and (e)(1)(ii) exempt the TEG dehydration units from the standards set forth in §63.764(d). With this exemption, the permittee is subject to the general requirement of §63.764(j), the monitoring requirement of §63.772(b)(2)(i), and the recordkeeping requirements of §§63.774(d)(1) and (d)(1)(ii). The conditional requirement of 40 C.F.R. §63.760(c) has also been included in the operating permit; the permittee is subject to this requirement if actual emissions of HAPs exceed or previously exceeded 5 tpy for a single HAP or 12.5 tpy for a combination of HAPs.

The table below describes each condition added to Section 7.0. of the Title V operating permit:

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
7.1.1.	Maximum dry natural gas throughput for each of the glycol dehydration units.	45CSR13	6.1.1.
7.1.2.	Each still vent shall be vented to a condenser through a closed vent system. The non-condensable gas shall be vented back to the reboiler.	45CSR13	6.1.2.
7.1.3.	Requirements for each dehydration unit's BTEX condenser.	45CSR13	6.1.3.
7.1.4.	Design and operation requirements for the flare which controls VOC and HAP emissions from the flash tanks. The applicable emission standards of 45CSR6 have been added as paragraphs g.1. through g.5. of this condition. NOTE: In R13-2831G, Condition 6.1.4.d. is stated to demonstrate compliance with the nonexistent Condition 6.1.2.2.(iv). The flare requirements included in 6.1.4.a. through f. of R13-2831G are derived from the flare requirements in the Natural Gas Compressor Station General Permit, with 6.1.4.d. being similar to 7.1.2.2.v. of the current general permit G35-E. As 7.1.2.2.v. of G35-E ensures compliance with the requirement to operate a flare at all times that emissions are vented to it (7.1.2.2.iv.) by monitoring for the presence of a pilot flame (7.2.1), the requirement in 6.1.4.d. of R13-2831G has been similarly updated in the operating permit. Therefore, Condition 7.1.4.d. of the operating permit states that compliance with the requirement to operate the flare at all times that emissions are vented to it (7.1.4.c.) will be demonstrated by monitoring for the presence of a pilot flame (7.2.1.).	45CSR13 45CSR§§6-4.1. and -4.3. through -4.6.	6.1.4.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
7.1.5.	Maximum hourly and annual limits for NO_X, CO, VOC, and aggregate HAP emissions from the flare.	45CSR13	6.1.5.
7.1.6.	Major source determination must be updated annually if actual emissions are greater than 5 tpy for a single HAP or 12.5 tpy for aggregate HAPs.	45CSR13 45CSR34 40 C.F.R. §63.760(c)	6.1.6.
7.1.7.	Exemption to the requirements of 40 C.F.R. §63.764(d) if actual average emissions of benzene from the TEG dehydration unit are less than 0.90 megagram per year (1 tpy).	45CSR13 45CSR34 40 C.F.R. §§63.764(e), (e)(1), and (e)(1)(ii)	6.1.7.
7.1.8.	Any affected source must be operated and maintained in a manner consistent with safety and good air pollution control practices for minimizing emissions.	45CSR34 40 C.F.R. §63.764(j)	N/A
7.2.1.	Compliance with the flare's operation requirements in Conditions 7.1.4.b. and d. is demonstrated by continuously monitoring the pilot flame with a thermocouple.	45CSR13	6.2.1.
7.2.2.	The throughput of dry natural gas fed to each dehydration unit must be monitored.	45CSR13	6.2.2.
7.2.3.	Each BTEX condenser must be regularly inspected and maintained according to the manufacturer's recommendations.	45CSR13	6.2.3.
7.3.1.	Method 22 visible emissions testing must be conducted for the flare to demonstrate compliance with the requirements of Condition 7.1.4.e.	45CSR13	6.3.1.
7.3.2.	Upon request of the Director, compliance shall be demonstrated with the VOC and HAP emission limits of Condition 7.1.5. using GLYCalc Version 3.0 or higher.	45CSR13	6.3.2.
7.3.3.	Procedure to determine the actual average benzene emissions from the glycol dehydration units.	45CSR13 45CSR34 40 C.F.R. §§63.772(b)(2) and (b)(2)(i)	6.3.3.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
7.3.4.	Parameters that must be included if the ProMax model is used as an alternative to the GLYCalc model.	45CSR13	6.3.4.
7.3.5.	The permittee must notify the responsible agency before the use of an alternative model.	45CSR13	6.3.5.
7.3.6.	The permittee must continue to use the ProMax model as an alternative until approved to use another method.	45CSR13	6.3.6.
7.3.7.	Particulate matter emissions testing for the combustor.	45CSR13 45CSR§§6-7.1. and -7.2.	6.1.4.g.
7.4.1.	To demonstrate compliance with the VOC and HAP emission limits of Condition 7.1.5. and the testing requirements of Condition 7.3.2., maintain records of testing conducted according to Condition 7.3.2. NOTE: In R13-2831G, Condition 6.4.1. specifies that this recordkeeping requirement demonstrates compliance with the condenser requirements of Condition 6.1.3. and the testing requirements of Condition 6.3.2. However, as the testing requirements of 6.3.2. demonstrate compliance with the flare's emission limits in Condition 6.1.5., this reference has been updated in the operating permit. Therefore, Condition 7.4.1. of the operating permit states that the records of the testing conducted under 7.3.2. shall demonstrate compliance with the flare emission limits of 7.1.5.	45CSR13	6.4.1.
7.4.2.	Maintain the corresponding records specified by the monitoring requirements of Section 7.2. and the testing requirements of Section 7.3.	45CSR13	6.4.2.
7.4.3.	Maintain records of the PTE HAP calculations for the entire affected facility, including the natural gas compressor engines and ancillary equipment.	45CSR13	6.4.3.
7.4.4.	Maintain records of the dry natural gas throughput through the dehydration system.	45CSR13	6.4.4.
7.4.5.	Maintain records of the actual average benzene emissions to demonstrate that the permittee is exempt from the requirements of 40 C.F.R. §63.764(d).	45CSR13 45CSR34 40 C.F.R. §§63.764(e), 63.774(d)(1) and (d)(1)(ii)	6.4.5.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
7.4.6.	Maintain records on-site or in a readily accessible off-site location for at least five years.	45CSR13	6.4.6.
7.5.1.	If testing is required to demonstrate compliance with Condition 7.3.3., the permittee must submit testing protocol at least thirty days prior and a notification at least fifteen days prior to testing.	45CSR13	6.5.1.
7.5.2.	The permittee must report any deviations from the allowable visible emission requirements.	45CSR13	6.5.2.
7.5.3.	The permittee must report any deviations from the flare design and operation criteria of Condition 7.1.4.	45CSR13	6.5.3.
7.5.4.	Exemption to the reporting requirements for area sources meeting the benzene exemption and subject to 40 C.F.R. Part 63 Subpart HH.	45CSR34 40 C.F.R. §§63.775(c) and (c)(8)	N/A

Section 8.0. – Reboilers and Hot Oil Heater

Each TEG dehydration unit is associated with a 1.0 mmBTU/hr reboiler (EURBL-1 to -3) which supplies heat to the regenerator/still. The reboilers are fueled by the overhead gases from the condenser.

The facility also operates a 3.35 mmBTU/hr hot oil heater (EUOH-01) which supplies heat to the condensate stabilizer. The hot oil heater is fueled by natural gas.

The reboilers and hot oil heater are subject to the following regulations:

1. **45CSR2** – *To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers*

   45CSR2 establishes particulate matter emission standards and requirements for fuel burning units. Per 45CSR§2-2.10., a fuel burning unit includes 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. Therefore, the reboilers and the hot oil heater are subject to the particulate matter emission standards of this rule.

   The reboilers and hot oil heater are subject to the visible emissions standards in 45CSR§2-3. The 10% opacity limit of 45CSR§2-3.1. has been included in the operating permit as Condition 8.1.3. Compliance with this limit is demonstrated through visible emission checks conducted in accordance with Method 9 of 40 C.F.R. Part 60 Appendix A, as designated by the Director. The permittee is also required to maintain records of each visible emission check and to report any deviations discovered during the observations.

   As each of the reboilers and the hot oil heater have a design heat input less than 10 mmBTU/hr, the permittee is exempt from the weight emission standards of Section 4; the fugitive emissions control standards of Section 5; the registration standards of Section 6; the testing, monitoring, recordkeeping, and reporting requirements

of Section 8; and the start-up, shutdown, and malfunction requirements of Section 9 of this rule per 45CSR§2-11.1.

2. **45CSR10** – *To Prevent and Control Air Pollution from the Emission of Sulfur Oxides*

   45CSR10 establishes sulfur oxides emission standards and requirements for fuel burning units. Per 45CSR§10-2.8., a fuel burning unit includes any furnace used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. Therefore, the reboilers and the hot oil heater are subject to the emission standards of this rule.

   However, per 45CSR§10-10.1., fuel burning units with a design heat input of less than 10 mmBTU/hr are exempt from the weight emission standards of Section 3; the registration requirements of Section 6; the permit requirements of Section 7; and the testing, monitoring, recordkeeping, and reporting requirements of Section 8. Furthermore, Section 4 is inapplicable because neither the reboilers nor the hot oil heater are part of a manufacturing process, and Section 5 is inapplicable because neither of the units combust a refinery or other process gas stream.

   Therefore, although the reboilers and the hot oil heater are subject to 45CSR10, the emission units currently have no applicable requirements under this rule.

3. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

The table below describes each condition added to Section 8.0. of the Title V operating permit:

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
8.1.1.	Maximum design heat input of the reboilers.	45CSR13	7.1.1.
8.1.2.	Maximum design heat input of the hot oil heater.	45CSR13	7.1.2.
8.1.3.	45CSR2 visible emission limit.	45CSR13 45CSR§2-3.1.	7.1.3.
8.2.1.	Method 9 visible emissions observations shall be conducted at times designated by the Secretary.	45CSR13	7.2.1.
8.3.1.	Testing methods for visible emissions observations.	45CSR13 45CSR§2-3.2.	7.3.1.
8.4.1.	Compliance with Condition 8.2.1. shall be demonstrated by maintaining records of each visible emissions check.	45CSR13	7.4.1.
8.5.1.	The permittee must report any deviations from the allowable visible emissions limit.	45CSR13	7.5.1.

Section 9.0. – Condensate Stabilizer and Storage Tanks

The condensate stabilizer (Emission Unit: EUSTAB) uses hot oil to heat the raw condensate and drive off the high volatility components. The stabilized condensate is routed to the ten stabilized condensate storage tanks (Emission Units: EUTK-1 to EUTK-10) which each have a design capacity of 400 bbl. The overheads are generally routed to the facility inlet by the vapor recovery unit (Control Device: VRU) but may be routed to the dehydrator/stabilizer flare (Control Device: APCFLARE) during upsets and maintenance.

Two produced water storage tanks (Emission Units: EUTK-11 and -12) are used to hold the produced fluid/water from the inlet separator and the dehydrators. The produced water storage tanks each have a design capacity of 400 bbl.

Gas vapors from the storage tanks EUTK-1 to EUTK-12 are routed to the VRU to control VOC and HAP emissions with a 98% control efficiency. During upsets and maintenance of the VRU, these emissions may be vented to the atmosphere.

The condensate stabilizer, stabilized condensate storage tanks, and produced water storage tanks are subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

The table below describes each condition added to Section 9.0. of the Title V operating permit.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
9.1.1.	Overheads from the condensate stabilizer will be captured by the VRU and routed to the facility inlet. For up to 120 hours per year, overheads may be routed to the flare.	45CSR13	8.1.1.
9.1.2.	Maximum combined annual throughput of stabilized condensate tanks and produced fluid/water tanks.	45CSR13	8.1.2.
9.1.3.	Maximum VOC emissions from storage tank battery.	45CSR13	8.1.3.
9.1.4.	Requirements for the operation of the vapor recovery unit.	45CSR13	8.1.4.
9.1.5.	Cover requirements for the storage tanks. NOTE: In R13-2831G, Condition 8.1.5.b.(iv) requires that the closed-vent system be designed and operated in accordance with the nonexistent Condition 8.1.7. As 8.1.5.b.(iv) references the design and operation requirements of the closed-vent system, this reference has been corrected in the Title V permit to Condition 9.1.4. which contains the requirements for the VRU which must be operated with the storage tanks as a closed vent system.	45CSR13	8.1.5.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
9.2.1.	The throughput of the storage tanks must be monitored.	45CSR13	8.2.1.
9.4.1.	To demonstrate compliance with Condition 9.1.1., the permittee must record the hours the stabilizer overheads were sent to the flare.	45CSR13	8.3.1.
9.4.2.	To demonstrate compliance with Conditions 9.1.2. and 9.1.3., the permittee must record the aggregate throughput to the storage tanks.	45CSR13	8.3.2.
9.4.3.	To demonstrate with the operational availability requirement of Condition 9.1.4.b., the permittee must maintain records of any downtime hours associated with the VRU system.	45CSR§30-5.1.c.	N/A

Section 10.0. – Truck Loading

The stabilized condensate and produced fluids collected in the storage tanks are removed from the facility via tanker truck (Emission Unit: EULOR, Emission Point: EPLOR). A 70% capture efficiency of VOC and HAP emissions has been assumed for tanker trucks that do not pass either the MACT-level annual leak test or the NSPS-level annual leak test, in accordance with AP-42 Section 5.2. Activated carbon cannisters are used to control the captured emissions of VOCs and HAPs from truck loading operations with an efficiency of 95% in order to achieve an overall control efficiency of 66.5% (70% $\times$ 95% = 66.5%).

The truck loading operations are subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

The table below describes each condition added to Section 10.0. of the Title V operating permit.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
10.1.1.	Maximum annual throughput of condensate and produced fluid/water to the storage tanks.	45CSR13	9.1.1.
10.1.2.	Maximum annual VOC and aggregate HAP emissions from the product loadout rack. NOTE: A footnote was added to these limits to clarify that the overall control efficiency of VOC and HAP emissions from EPLOR is 66.5% which is based on an assumed 70% capture efficiency and a 95% control efficiency of the activated carbon canisters.	45CSR13 45CSR§30-5.1.c.	9.1.2.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
10.1.3.	Requirements for truck loading operations.	45CSR13	9.1.3.
10.1.4.	The truck loading shall be operated in accordance with the plans and specifications filed in the application for R13-2831F. NOTE: The specifications for truck loading operations were last modified under R13-2831F. Therefore, the referenced application has been revised.	45CSR13	9.1.4.
10.2.1.	The permittee shall monitor the throughput of the truck loading on a monthly basis.	45CSR13	9.2.1.
10.4.1.	Records required under Section 10.4. must be kept in accordance with Condition 3.4.2.	45CSR13	9.3.1.
10.4.2.	Records of the aggregate throughput for the truck loading must be maintained to demonstrate compliance with Conditions 10.1.1. and 10.1.2.	45CSR13	9.3.2.

Section 11.0. – Compressor Blowdowns, Engine Startups, and Pigging Operations

Compressor blowdowns (Emission Unit: EUBD, Emission Point: EPBD), engine startups (Emission Unit: EUESU, Emission Point: EPESU), and pigging operations (Emission Unit: EUPIG, Emission Point: EPPIG) are conducted at the facility. Emissions of VOCs and HAPs from these operations are vented to the atmosphere.

The compressor blowdowns, engine startups, and pigging operations are subject to the following regulations:

1. **45CSR13** – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation*

The table below describes each condition added to Section 11.0. of the Title V operating permit:

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
11.1.1.	The annual limit for the number and volume of compressor blowdown events.	45CSR13	10.1.1.
11.1.2.	The annual limit for the number and volume of engine startup events.	45CSR13	10.1.2.
11.1.3.	The annual limit for the number and volume of emergency plant shutdown tests.	45CSR13	10.1.3.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-2831G Condition
11.1.4.	The annual limit for the number and volume of pigging events.	45CSR13	10.1.4.
11.4.1.	Records required in Section 11.4. must be kept in accordance with Condition 3.4.2.	45CSR13	10.2.1.
11.4.2.	Compliance with Conditions 11.1.1. through 11.1.4. is demonstrated by maintaining records of the compressor blowdown, engine startup, emergency plant shutdown, and pigging events and the estimated volume per event.	45CSR13	10.2.2.
11.5.1.	Any exceedances of the limitations in Conditions 11.1.1. through 11.1.4. must be reported to the Director of the DAQ within ten calendar days.	45CSR13	10.3.1.

Non-Applicability Determinations

The following requirements have been determined not to be applicable to the subject facility due to the following:

1. **45CSR21** – *Regulation to Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds* – This rule applies to sources located in Putnam County, Kanawha County, Cabell County, Wayne County, and Wood County. The facility is located in Marshall County, and, therefore, the rule is inapplicable.

2. **45CSR27** – *To Prevent and Control the Emissions of Toxic Air Pollutants* – This rule does not apply to the Miller Compressor Station because, per 45CSR§27-2.4., the equipment used in the production and distribution of petroleum products is not considered a chemical processing unit, provided that such equipment does not produce or contact materials containing more than 5% benzene by weight.

3. **40 C.F.R. Part 60 Subparts D, Da, Db, and Dc** – *Standards of Performance for Steam Generators* – As there are no steam generating units with a maximum design heat input equal to or greater than 10 mmBTU/hr operated at the facility, Subparts D, Da, Db, and Dc do not apply to the Miller Compressor Station per 40 C.F.R. §§60.40(a), 60.40Da(a), 60.40b(a), and 60.40c(a), respectively.

4. **40 C.F.R. Part 60 Subparts K, Ka, and Kb** – *Standards of Performance for Storage Vessels for Petroleum Liquids/Volatile Organic Liquids* – Subparts K and Ka do not apply to the Miller Compressor Station because construction of the storage vessels used at the facility began after the applicability dates of each subpart (Subpart K – after June 11, 1973 and prior to May 19, 1978; Subpart Ka – after May 18, 1978 and prior to July 23, 1984). Per 40 C.F.R. §60.110b(a), Subpart Kb does not apply to the facility because each volatile organic liquid storage vessel has a capacity less than 75 m^3 (471.73 bbl).

5. **40 C.F.R. Part 60 Subpart GG** – *Standards of Performance for Stationary Gas Turbines* – Per 40 C.F.R. §60.330(a), Subpart GG does not apply because no stationary gas turbines with a heat input at peak load equal to or greater than 10 mmBTU/hr, based on the lower heating value of the fuel fired, are operated at the facility.

6. **40 C.F.R. Part 60 Subpart KKK** – *Standards of Performance for 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* – The Miller Compressor Station is not a natural gas processing plant as defined in 40 C.F.R. §60.631 and, therefore, is not subject to the provisions of Subpart KKK.

7. **40 C.F.R. Part 60 Subpart LLL** – *Standards of Performance for SO_2 Emissions from Onshore Natural Gas Processing for which Construction, Reconstruction, or Modification Commenced after January 20, 1984 and on or before August 23, 2011* – Per 40 C.F.R. §60.640(a), Subpart LLL does not apply because no sweetening units are operated at the compressor station.

8. **40 C.F.R. Part 60 Subpart IIII** – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines* – This subpart does not apply because only spark ignition internal combustion engines are operated at the Miller Compressor Station.

9. **40 C.F.R. Part 60 Subpart KKKK** – *Standards of Performance for Stationary Combustion Turbines* – Per 40 C.F.R. §60.4305(a), Subpart KKKK does not apply because no stationary combustion turbines with a heat input at peak load equal to or greater than 10 mmBTU/hr, based on the higher heating value of the fuel, are operated at the facility.

10. **40 C.F.R. Part 63 Subpart HHH** – *National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities* – The Miller Compressor Station is not a natural gas transmission and storage facility located prior to a local distribution company or to a final end user. Additionally, the facility is not a major source of HAP emissions. Therefore, per 40 C.F.R. §63.1270(a), the Miller Compressor Station is not subject to Subpart HHH.

11. **40 C.F.R. Part 63 Subpart YYYY** – *National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines* – Per 40 C.F.R. §63.6080, Subpart YYYY does not apply because the Miller Compressor Station is not a major source of hazardous air pollutants.

12. **40 C.F.R. Part 63 Subpart DDDDD** – *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters* – Per 40 C.F.R. §63.7485, Subpart DDDDD does not apply because the Miller Compressor Station is not a major source of hazardous air pollutants.

13. **40 C.F.R. Part 63 Subpart CCCCCC** – *National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities* – The Miller Compressor Station is not a gasoline dispensing facility (GDF) as defined in 40 C.F.R. §63.11132. Therefore, per 40 C.F.R. § 63.11111(a), the Miller Compressor Station is not subject to Subpart CCCCCC.

14. **40 C.F.R. Part 63 Subpart JJJJJJ** – *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources* – Per 40 C.F.R. §63.11195(e), gas-fired boilers are exempt from the standards of Subpart JJJJJJ. Therefore, the natural gas-fired reboilers (EURBL-1 through EURBL-3) operated at the Miller Compressor Station are not subject to Subpart JJJJJJ.

15. **40 C.F.R. Part 64** – *Compliance Assurance Monitoring (CAM)*

    The compressor engines (EUCE-2a, EUCE-3, EUCE-4a, EUCE-5 to EUCE-8, and EUCE-12 to EUCE-15) are subject to the provisions of Subpart JJJJ of the NSPS and Subpart ZZZZ of the NESHAP. Therefore, the engines are exempt from CAM per 40 C.F.R. §64.2(b)(1)(i).

    The dehydration unit flash tanks (EUDFT-1 to EUDFT-3), the condensate stabilizer (EUSTAB), the condensate storage tanks (EUTK-1 to EUTK-10), the produced water storage tanks (EUTK-11 and EUTK-12), and the truck loadout operations (EULOR) do not have pre-control device emissions that exceed the Title V major source thresholds. Therefore, per 40 C.F.R. §64.2(a)(3), these emission units are not subject to CAM.

    The CAM rule is applicable to the dehydration unit still vents (EUDSV-1 to EUDSV-3) for emissions of VOCs. Emissions from each of the still vents are controlled by a dedicated condenser (§64.2(a)(2)), each still vent has

pre-control device VOC emissions of 151.56 tpy which exceeds the Title V major source thresholds (§64.2(a)(3)), and the still vents and condensers are subject to operational requirements under the NSR permit R13-2831G (§64.2(a)(1)). However, as the post control device VOC emissions of the dehydration unit still vents are below Title V major source thresholds, each of these units are considered "Other Pollutant-Specific Emission Units" in accordance with §64.5(b). Therefore, the submission of a CAM Plan is deferred until the renewal application is submitted for this operating permit.

The dehydration unit still vents also meet the CAM applicability requirements for emissions of Xylenes and aggregate HAPs. However, as the dehydration units are subject to Subpart HH of the NESHAP, the dehydration unit still vents are exempt from CAM for emissions of aggregate HAPs per §64.2(b)(1)(i).

Request for Variances or Alternatives

None.

Insignificant Activities

Insignificant emission unit(s) and activities are identified in the Title V application.

Comment Period

Beginning Date:
Ending Date:

Point of Contact

All written comments should be addressed to the following individual and office:

Sarah Barron
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304
304/414-1915
sarah.k.barron@wv.gov

Procedure for Requesting Public Hearing

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing, if no public hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. The Secretary shall grant such a request for a hearing if he/she concludes that a public hearing is appropriate. Any public hearing shall be held in the general area in which the facility is located.

Response to Comments (Statement of Basis)

Not applicable.

Barron, Sarah K <sarah.k.barron@wv.gov>

WVDAQ Permit Application: Appalachia Midstream Services, LLC ; Miller Compressor Station

Steeber, Jeff <Jeff.Steeber@williams.com> Tue, Sep 10, 2024 at 10:35 AM
To: "DEPAirQualityPermitting@wv.gov" <DEPAirQualityPermitting@wv.gov>
Cc: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Good Morning,

Please find attached a Class I Administrative Update application for Appalachia Midstream Services, LLC – Miller Compressor Station.

- DAQ Facility ID (for existing facilities only): **051-00130**
- Current 45CSR13 permit associated with this process (for existing facilities only): **R13-2831G**

Please reach out with any questions or concerns regarding this submittal.

Thank you,

Jeff Steeber

Jeff Steeber | Williams | Environmental Specialist | Ohio River Supply Hub
Office: 304-843-3125| Cell: 304-650-4741 | 100 Teletech Drive, Moundsville WV 26041

000-AMS-Miller CS-Class I Update Application-092024.pdf
602K

Email Cover Letter

Division of Air Quality Permit Application Submittal

(Email to: **DEPAirQualityPermitting@wv.gov**)

Please find attached a permit application for: **Appalachia Midstream Services, LLC – Miller Compressor Station**

Subject: [Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): **051-00130**
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): **R13-2831G**

- Type of NSR Application (check all that apply):
  - ☐ Construction
  - ☐ Modification
  - ☒ **Class I Administrative Update**
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Application: N/A
  - ☐ Title V Initial
  - ☐ Title V Renewal
  - ☐ Administrative Amendment**
  - ☐ Minor Modification**
  - ☐ Significant Modification**
  - ☐ Off Permit Change

**If the box above is checked, include the Title V revision information as ATTACHMENT S to the combined NSR/Title V application.

- Payment Type: N/A
  - ☐ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)
    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☐ Responsible Official/Authorized Representative
    - Name:
    - Email:
    - Phone Number:
  - ☒ **Company Contact**
    - Name: **Jeff Steeber, Environmental Specialist**
    - Email: **Jeff.Steeber@Williams.Com**
    - Phone Number: **(304) 650-4741**
  - ☐ Consultant
    - Name:
    - Email:
    - Phone Number:

Williams Ohio Valley Midstream LLC
100 Teletech Drive, Suite 2
Moundsville, WV 26041
(304) 650-4741

September 10, 2024
(Via Electronic Mail)

Beverly McKeone
New Source Review Program Manager
Division of Air Quality
West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304-2345

Subject: **Application for 45CSR13 Class I Administrative Permit Update**
Appalachia Midstream Services, LLC
Miller Compressor Station (DAQ Plant ID No. 051–00130)
Marshall County, West Virginia

Dear Ms. McKeone:

Appalachia Midstream Services, LLC is submitting an Application for 45CSR13 Class I Administrative Permit Update for the Miller Compressor Station located at 1779 Johnson Ridge (aka, Wetzel County Road 1/22) near Bannen in Wetzel and Marshall Counties, West Virginia.

The requested 45CSR13 Class I Administrative Permit Update is to update the flare allowable emission rates shown in Condition 6.1.5 of Permit R13-2831G. The current allowable emission rates reflect the flare controlling the condensate stabilizer, dehydrator flash tank offgas and still vent waste streams; however, the flare controls only the condensate stabilizer and dehydrator flash tank offgas streams. Correcting the flare allowable emission rates results in a decrease in VOC and HAP emissions as shown below and the change qualifies as a Class I administrative update.

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	1.96	2.15
Carbon Monoxide	6.20	6.79
Volatile Organic Compounds	**8.37**	**4.70**
Total HAPs	**0.90**	**0.45**

If you have any questions concerning this submittal or need additional information, please contact me at (304) 650-4741 or jeff.steeber@williams.com.

Sincerely,

Jeff Steeber

Jeff Steeber
Environmental Specialist

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

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

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

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

☐ CONSTRUCTION ☐ MODIFICATION ☐ RELOCATION

☒ **CLASS I ADMINISTRATIVE UPDATE** ☐ TEMPORARY

☐ CLASS II ADMINISTRATIVE UPDATE ☐ AFTER-THE-FACT

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

☐ ADMINISTRATIVE AMENDMENT ☐ MINOR MODIFICATION

☐ SIGNIFICANT MODIFICATION

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

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

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Appalachia Midstream Services, LLC

2. Federal Employer ID No. ***(FEIN):***
2 6 – 3 6 7 8 9 7 2

3. Name of facility *(if different from above):*
Miller Compressor Station

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

5A. Applicant's mailing address:
100 Teletech Drive, Ste 2
Moundsville, WV 26041-2352

5B Facility's present physical address:
1779 Johnson Ridge (Wetzel Co Rd 1/22)
Bannen, WV 26033

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ NO
- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: **Williams Companies, Inc.**

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ NO
- If **YES,** please explain: **Applicant owns the property**
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.):
Natural Gas Compressor Station

10. North American Industry Classification System **(NAICS)** code for the facility:
213112

11A. DAQ Plant ID No. (for existing facilities only):
0 5 1 – 0 0 1 3 0

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
Permit No. R13-2831G

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

12A.

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

Directions from New Martinsville:
1) Head north on WV-2 (Energy Rd) ~4.6 mi;
2) Turn right onto Proctor Creek Rd ~9.3 mi;
3) Sharp left to stay on Proctor Creek Rd ~6.9 mi;
4) Turn left onto Johnson Ridge (CoRd-1/22) ~1.8 mi;
5) Destination is on the right.

12.B. New site address (if applicable)	12C. Nearest city or town:	12D. County:
1779 Johnson Ridge (Marshall County Rd 1/22) ~13.5 Miles ENE of New Martinsville	**~1.8 Miles WSW of Bannen**	**Wetzel and Marshall**
12.E. UTM Northing (KM):	12F. UTM Easting (KM):	12G. UTM Zone:
4,396.919	**532.490**	**17S**

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

- **Correct Permit Condition 6.1.5 to reflect the flare controlling the dehydrator flash tank offgas waste stream and not both the flash tank offgas and still vent streams**

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

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

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

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

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

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

Section II. Additional attachments and supporting documents.

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

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

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

➢ Indicate the location of the nearest occupied structure (e.g., church, school, business, residence).

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

23. Provide a **Process Description** as **Attachment G**.

➢ Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

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

24. Provide **Safety Data Sheets (SDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

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

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

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

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

☐ Bulk Liquid Transfer Operations
☐ Chemical Processes
☐ Concrete Batch Plant
☐ Grey Iron and Steel Foundry
☐ Haul Road Emissions
☐ Hot Mix Asphalt Plant
☐ Incinerator
☐ Indirect Heat Exchanger
☐ Quarry
☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Storage Tanks
☐ General Emission Unit, specify: **Glycol Dehydration Unit**

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

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

☐ Absorption Systems
☐ Adsorption Systems
☐ Afterburner
☐ Baghouse
☐ Condenser
☐ Electrostatic Precipitator
☐ Flare
☐ Mechanical Collector
☐ Wet Collecting System
☐ Other Collectors, specify:

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

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

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

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

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

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ YES ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information.

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

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

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

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

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

Certification of Truth, Accuracy, and Completeness

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

Compliance Certification

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

SIGNATURE DocuSigned by: TJ Rinke DE800755CD4A4F0... *(Please use blue ink)* DATE: 9/9/2024 | 8:50 AM PDT *(Please use blue ink)*

35B. Printed name of signee: **T.J. Rinke**		35C. Title: **Vice President**
35D. E-mail: **T.J.Rinke@Williams.com**	36E. Phone: **(918) 573-9968**	36F. FAX: **---**
36A. Printed name of contact person (if different from above): **Jeff Steeber**		36B. Title: **Environmental Specialist**
35C. E-mail: **Jeff.Steeber@Williams.com**	36D. Phone: **(304) 650-4741**	36E. FAX: **---**

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☐ **Attachment A: Business Certificate**
- ☐ **Attachment B: Map(s)**
- ☐ **Attachment C: Installation and Start Up Schedule**
- ☐ **Attachment D: Regulatory Discussion**
- ☐ **Attachment E: Plot Plan**
- ☐ **Attachment F: Detailed Process Flow Diagram(s)**
- ☐ **Attachment G: Process Description**
- ☐ **Attachment H: Safety Data Sheets (SDS)**
- ☐ **Attachment I: Emission Units Table**
- ☐ **Attachment J: Emission Points Data Summary Sheet**
- ☐ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☐ **Attachment L: Emissions Unit Data Sheet(s)**
- ☐ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☐ **Attachment N: Supporting Emissions Calculations**
- ☐ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☐ **Attachment P: Public Notice**
- ☐ **Attachment Q: Business Confidential Claims**
- ☐ **Attachment R: Authority Forms**
- ☐ **Attachment S: Title V Permit Revision Information**
- ☐ **Application Fee**

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

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

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

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

Appalachia Midstream Services, LLC (AMS)

Miller Compressor Station

Application for 45CSR13 Class I Administrative Permit Update

Dehydrators 01-03 (Flash Tanks (DFT) and Still Vents (DSV))

Unit ID	Description	Capacity	Reference	Pollutant	GRI-GLYCalc Pre-Control Emissions		Worst-Case Pre-Control VOC/GHG: 15% Margin HAP: 15% Margin		Control Efficiency	Controlled Emissions	
					lb/hr	tpy	lb/hr	tpy	%	lb/hr	tpy
DFT-1 DFT-2 DFT-3 (Each)	Dehydrator Flash Tank Flash Tank Off-Gas Controlled by 98% Flare (FLR)	Flow Rate 55.0 MMscfd 8,760 hr/yr	GRI-GLYCalc 4.0	VOC	13.09	56.43	15.06	64.89	98.0%	**0.32**	**1.33**
			GRI-GLYCalc 4.0	Benzene	4E-03	0.02	5E-03	0.02		**1E-04**	**4E-04**
			GRI-GLYCalc 4.0	Ethylbenzene	3E-04	1E-03	3E-04	2E-03		**7E-06**	**3E-05**
			GRI-GLYCalc 4.0	n-Hexane	0.16	0.71	0.19	0.82		**4E-03**	**0.02**
			Process Simulation	Methanol	0.42	0.91	0.42	0.91		**0.02**	**0.05**
			GRI-GLYCalc 4.0	Toluene	4E-03	0.02	4E-03	0.02		**9E-05**	**4E-04**
			GRI-GLYCalc 4.0	2,2,4-TMP	2E-03	0.01	3E-03	0.01		**7E-06**	**3E-05**
			GRI-GLYCalc 4.0	Xylenes	0.01	0.02	0.01	0.03		**1E-04**	**6E-04**
			GRI-GLYCalc 4.0	Tot HAP	0.59	2.60	0.62	1.81		**0.03**	**0.07**
			GRI-GLYCalc 4.0	CO2	0.92	4.03	1.06	4.63	---	**1.06**	**4.63**
			GRI-GLYCalc 4.0	CH4	22.67	99.28	26.07	114.18	98.0%	**0.52**	**2.28**
			40CFR98 - Table A-1	CO2e	567.60	2,486	653	2,859	97.8%	**14.09**	**61.72**
DSV-1 DSV-2 DSV-3 (Each)	Dehydrator Still Vent Still Vent Off-Gas Controlled by Condenser/95% Reboiler	Flow Rate 55.0 MMscfd 8,760 hr/yr	GRI-GLYCalc 4.0	VOC	31.42	131.79	36.13	151.56	95.7%	**1.54**	**6.42**
			GRI-GLYCalc 4.0	Benzene	0.89	3.89	1.02	4.48	95.4%	**0.05**	**0.21**
			GRI-GLYCalc 4.0	Ethylbenzene	0.19	0.83	0.22	0.95	96.6%	**0.01**	**0.03**
			GRI-GLYCalc 4.0	n-Hexane	0.91	3.98	1.04	4.57	95.2%	**0.05**	**0.22**
			Process Simulation	Methanol	2.66	5.82	2.66	5.82	94.3%	**0.15**	**0.33**
			GRI-GLYCalc 4.0	Toluene	1.39	6.11	1.60	7.02	95.9%	**0.07**	**0.29**
			GRI-GLYCalc 4.0	2,2,4-TMP	0.01	0.06	0.02	0.07	95.3%	**8E-04**	**3E-03**
			GRI-GLYCalc 4.0	Xylenes	6.12	26.81	7.04	30.84	96.9%	**0.22**	**0.97**
			GRI-GLYCalc 4.0	Tot HAP	12.17	53.31	13.60	53.75	96.0%	**0.55**	**2.05**
			GRI-GLYCalc 4.0	CO2	1.06	4.64	1.22	5.34	---	**1.22**	**5.34**
			GRI-GLYCalc 4.0	CH4	1.52	6.66	1.75	7.66	95.0%	**0.09**	**0.38**
			40CFR98 - Table A-1	CO2e	38.01	171.14	44.93	196.81	92.4%	**3.40**	**14.91**
DHY-1 DHY-2 DHY-3 (Each)	Dehydrator (Total)	Flow Rate 55.0 MMscfd 8,760 hr/yr	GRI-GLYCalc 4.0	VOC	44.51	188.22	51.18	216.45	96.4%	**1.86**	**7.75**
			GRI-GLYCalc 4.0	Benzene	0.89	3.91	1.03	4.50	95.4%	**0.05**	**0.21**
			GRI-GLYCalc 4.0	Ethylbenzene	0.19	0.83	0.22	0.95	96.6%	**0.01**	**0.03**
			GRI-GLYCalc 4.0	n-Hexane	1.07	4.68	1.23	5.39	95.6%	**0.05**	**0.24**
			Process Simulation	Methanol	3.07	6.73	3.07	6.73	94.3%	**0.18**	**0.39**
			GRI-GLYCalc 4.0	Toluene	1.40	6.12	1.61	7.04	95.9%	**0.07**	**0.29**
			GRI-GLYCalc 4.0	2,2,4-TMP	0.02	0.08	0.02	0.09	95.9%	**8E-04**	**3E-03**
			GRI-GLYCalc 4.0	Xylenes	6.13	26.84	7.05	30.86	96.9%	**0.22**	**0.97**
			GRI-GLYCalc 4.0	Tot HAP	12.77	55.91	14.22	55.56	96.0%	**0.57**	**2.12**
			GRI-GLYCalc 4.0	CO2	1.98	8.67	2.28	9.97	---	**2.28**	**9.97**
			GRI-GLYCalc 4.0	CH4	24.19	105.94	27.82	121.83	97.8%	**0.61**	**2.67**
			40CFR98 - Table A-1	CO2e	605.62	2,657	698	3,056	97.5%	**17.50**	**76.63**

Notes: 1 - Used GRI-GLYCalc V4.0 to calculate Flash Tank and Regenerator/Still Vent emissions. Process Simulation used to calculate MeOH emissions. Total VOC includes MeOH.

2 - GRI-GLYCalc 4.0 Model Results are based on the following input:

Inlet Gas:	80 oF and 1,000 psig, H2O Saturated	Primary Glycol Pump:	Electric/Pneumatic - 15 gpm
Inlet Gas Analysis:	See Supplement S1 - Inlet Gas Summary	Backup Glycol Pump:	Kimray Gas-Assist - 7.5 gpm
Dry Gas:	55 MMscfd, 7.0 lb-H2O/MMscf	Flash Tank:	80 oF, 60 psig, 98% Combustion
Lean Glycol:	1.5 wt% H2O	Stripping Gas:	None
		Regen Control:	Condenser/95% Combustion

3 - A contingency has been added to the GRI-GLYCalc model results to account for potential future changes in gas composition.

Condensate Stabilizer By-Pass (STAB)

Source ID	Unit Description	Total STAB O/H Volume	STAB O/H Routed to FLR		Pre-Control VOC 50,225 Gas lb/MMscf		FLR Control %	VOC 50,225 lb/MMscf			CO2 (w/o Control) 350 Gas lb/MMscf		CH4 16,325 Gas lb/MMscf		CO2e CH4 GWP = 25	
		scf/hr	hr/yr	Mscf/yr	lb/hr	tpy		lb/hr (max)	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
STAB	Condensate Stabilizer By-Pass	7,282	120	873.80	5.01	21.94	98.0%	7.31	0.10	0.44	0.03	0.15	0.03	0.14	0.85	3.72
* lb/hr averaged over 8,760 hr/yr.			**TOTAL:**	**873.80**	**5.01**	**21.94**	**TOTAL:**	**7.31**	**0.10**	**0.44**	**0.03**	**0.15**	**0.03**	**0.14**	**0.85**	**3.72**
							Pre-Control:	365.72	5.01	21.94	0.03	0.15	1.63	7.13	40.74	178.46

Source ID	Unit Description	Benzene 25.00 Gas lb/MMscf		Ethylbenzene 25.00 Gas lb/MMscf		n-Hexane 925.00 Gas lb/MMscf		Methanol 25.00 Gas lb/MMscf		Toluene 25 Gas lb/MMscf		2,2,4-TMP 175.00 Gas lb/MMscf		Xylene 25.00 Gas lb/MMscf		Total HAP 1,225 Gas lb/MMscf	
		lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
STAB	Condensate Stabilizer By-Pass	5E-05	2E-04	5E-05	2E-04	2E-03	0.01	5E-05	2E-04	5E-05	2E-04	3E-04	2E-03	5E-05	2E-04	2E-03	0.01
* lb/hr averaged over 8,760 hr/yr.	**TOTAL:**	**5E-05**	**2E-04**	**5E-05**	**2E-04**	**2E-03**	**0.01**	**5E-05**	**2E-04**	**5E-05**	**2E-04**	**3E-04**	**2E-03**	**5E-05**	**2E-04**	**2E-03**	**0.01**
	Pre-Control:	2E-03	0.01	2E-03	0.01	0.09	0.40	2E-03	0.01	2E-03	0.01	0.02	0.08	2E-03	0.01	0.12	0.54

Notes:

1 - The results of a representative **Condensate Stabilizer Overheads Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Analysis):

Pollutant	Wet Gas	Worst Case	%Total	%VOC
CO2	299.55 lb/MMscf	**350.00 lb/MMscf**	0.42	0.70
Methane (CH4)	14,187 lb/MMscf	**16,325 lb/MMscf**	19.67	32.50
N2/Water/Ethane/Etc	24,734 lb/MMscf	**16,100 lb/MMscf**	19.40	32.06
VOC	43,655 lb/MMscf	**50,225 lb/MMscf**	60.51	100.00
TOTAL Gas	82,924 lb/MMscf	**83,000 lb/MMscf**	100.00	---
Benzene	0.09 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
Ethylbenzene	3.66 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
n-Hexane	794.48 lb/MMscf	**925.00 lb/MMscf**	1.11	1.84
Methanol (MeOH)	1.69 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
Toluene	1.44 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
2,2,4-TMP	132.21 lb/MMscf	**175.00 lb/MMscf**	0.21	0.35
Xylenes	5.24 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
Total HAP	938.81 lb/MMscf	**1,225 lb/MMscf**	1.48	2.44

2 - The condensate stabilizer overheads will normally be captured by a vapor recovery unit and routed to the facility inlet; however, for operating flexibility and during maintenance activities, the stabilizer overheads will be sent to the flare for up to 5 days per year (i.e., 120 hours) for 98% control of the vapors.

Dehydrator/Stabilizer Flare (FLR) - Modify

Source ID	Description	Reference	Pollutant	Emission Factor		Combustion Emissions			Total FLR Emissions (Combustion + 3*DFT + STAB)		
				lb/MMscf	lb/MMBtu	lb/hr (max)	lb/hr (ave)	tpy	lb/hr (max)	lb/hr (ave)	tpy
FLR	Dehydrator/Stabilizer Flare	EPA AP-42 Table 1.4-1	NOX	147.42	0.10	**1.96**	**0.49**	**2.15**	**1.96**	**0.49**	**2.15**
		EPA AP-42 Table 13.5-1	CO	466.13	0.31	**6.20**	**1.55**	**6.79**	**6.20**	**1.55**	**6.79**
		EPA AP-42 Table 1.4-2	NMNEHC	8.00	0.01	**0.11**	**0.03**	**0.12**	**8.37**	**1.07**	**4.70**
	Controls	EPA AP-42 Table 1.4-2	VOC	8.11	0.01	**0.11**	**0.03**	**0.12**	**8.37**	**1.07**	**4.70**
	DFT-01 thru DFT-03 Flash-Tank and Stabilizer Overhead Emissions	EPA AP-42 Table 1.4-2	PM10/2.5	11.20	0.01	**0.15**	**0.04**	**0.16**	**0.15**	**0.04**	**0.16**
		EPA AP-42 Table 1.4-2	SO2	8.84E-01	5.9E-04	**0.01**	**3E-03**	**0.01**	**0.01**	**3E-03**	**0.01**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	**---**	**---**	**---**	**---**	**---**	**---**
	Site Rating	EPA AP-42 Table 1.4-3	Acrolein	---	---	**---**	**---**	**---**	**---**	**---**	**---**
	20.00 MMBtu/hr (HHV) (max)	EPA AP-42 Table 1.4-3	Benzene	3.10E-03	2.1E-06	**4E-05**	**1E-05**	**5E-05**	**0.02**	**5E-04**	**2E-03**
	5.00 MMBtu/hr (HHV) (ave)	EPA AP-42 Table 1.4-4	1,3-Butadiene	---	---	**---**	**---**	**---**	**---**	**---**	**---**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	**---**	**---**	**---**	**0.02**	**2E-04**	**1E-03**
	Current:	EPA AP-42 Table 1.4-3	Formaldehyde	1.11E-01	7.4E-05	**1E-03**	**4E-04**	**2E-03**	**1E-03**	**4E-04**	**2E-03**
	42.18 MMBtu/hr (HHV)	EPA AP-42 Table 1.4-3	n-Hexane	2.65	1.8E-03	**0.04**	**0.01**	**0.04**	**0.64**	**0.03**	**0.12**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**	**---**	**0.09**	**0.07**	**0.32**
	98.0% Control Efficiency	EPA AP-42 Table 1.4-3	POM/PAH	1.03E-03	6.8E-07	**1E-05**	**3E-06**	**1E-05**	**1E-05**	**3E-06**	**1E-05**
		EPA AP-42 Table 1.4-3	Toluene	5.01E-03	3.3E-06	**7E-05**	**2E-05**	**7E-05**	**0.02**	**5E-04**	**2E-03**
	1,504 Btu/scf (HHV)	EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	**---**	**---**	**---**	**0.11**	**2E-03**	**0.01**
		EPA AP-42 Table 1.4-3	Xylenes	---	---	**---**	**---**	**---**	**0.02**	**6E-04**	**3E-03**
	13,000 scf/hr (max)	EPA AP-42 Table 1.4-3	Other/Trace HAP	1.77E-03	1.2E-06	**2E-05**	**6E-06**	**3E-05**	**2E-05**	**6E-06**	**3E-05**
	3,250 scf/hr (ave)	Sum	Total HAP	2.77	1.8E-03	**0.04**	**0.01**	**0.04**	**0.90**	**0.10**	**0.45**
	312,000 scfd (max)	EPA AP-42 Table 1.4-2	CO2 (GWP=1)	176,898	117.65	**2,353**	**588.24**	**2,576**	**2,359**	**591.44**	**2,591**
	78,000 scfd (ave)	EPA AP-42 Table 1.4-2	CH4 (GWP=25)	3.39	2.3E-03	**0.05**	**0.01**	**0.05**	**3.99**	**1.61**	**7.04**
	28.47 MMscf/yr	EPA AP-42 Table 1.4-2	N2O (GWP=298)	3.24	2.2E-03	**0.04**	**0.01**	**0.05**	**0.04**	**0.01**	**0.05**
		Weighted Sum	CO2e	177,950	118.35	**2,367**	**591.73**	**2,592**	**2,471**	**634.86**	**2,781**

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

2 - Heat Input to Flare is determined as follows:

Waste/Pilot Gas Stream	scf/hr (max)	scf/hr (ave)	Btu/scf (HHV)	MMBtu/hr (max)	MMBtu/hr (ave)	Source(s)
Dehy 01 Flash-Tank Off-Gas	851	846	1,524	1.30	1.29	See Attachments: C1 - Btu Loading, C2 - Vendor Data, and C3 - Supporting Documents
Dehy 02 Flash-Tank Off-Gas	851	846	1,524	1.30	1.29	
Dehy 03 Flash-Tank Off-Gas	851	846	1,524	1.30	1.29	
Stab O/H (120 hr/yr)	7,282	100	1,832	13.34	0.18	
Purge, Fuel, and Pilot Gas	175	175	1,020	0.18	0.18	
15% Contingency	1,501	421.91	1,504	2.26	0.63	
Total Gas to Flare:	**11,510**	**3,235**	**1,504**	**19.66**	**4.86**	
	276,234 scfd	**77,632 scfd**	**Round-Up:**	**20.00**	**5.00**	
Round-Up:	**312,000 scfd**	**78,000 scfd**				

3 - The condensate stabilizer overheads will normally be captured by a vapor recovery unit and routed to the facility inlet; however, for operating flexibility and during maintenance activities, the stabilizer overheads will be sent to the flare for up to 5 days per year (i.e., 120 hours) for 98% control of the vapors.

Barron, Sarah K <sarah.k.barron@wv.gov>

Miller CS - Flare PTE Correction

Steeber, Jeff <Jeff.Steeber@williams.com> Thu, Sep 5, 2024 at 9:18 AM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Good Morning Sarah,

Sorry, I missed your call last week; I was out of the office.

I do have the permit application ready; it will be submitted on Monday 9/9/2024 after RO Signoff.

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Wednesday, July 31, 2024 4:11 PM
To: Beverly D McKeone <beverly.d.mckeone@wv.gov>; Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: [EXTERNAL] Fwd: Miller CS - Flare PTE Correction

Hi Bev,

[Quoted text hidden]

Barron, Sarah K <sarah.k.barron@wv.gov>

Miller CS - Flare PTE Correction

Steeber, Jeff <Jeff.Steeber@williams.com> Tue, Aug 20, 2024 at 1:12 PM
To: Roy F Kees <roy.f.kees@wv.gov>, "Barron, Sarah K" <sarah.k.barron@wv.gov>

Good Afternoon Roy and Sarah,

I wanted to check in on the inquiry below:

“Appalachia Midstream Services, LLC (AMS) is seeking a revision to Miller Compressor Station Permit R13-2831G. Permit Condition 6.1.5 which contains incorrect emission limits for the process flare as it reflects the dehydrators flash tank offgas and still vent streams routed to the control device whereas only the flash tank offgas streams are controlled by the flare. As the permit revision will result in a decrease in potential to emit, a Class I administrative amendment is sought to accomplish the requested change. Please advise if AMS can pursue the requested permit change through a Class I administrative permit update”

Sarah is working on Miller Compressor Station’s Initial Title V Permit and discovered the error on our part – if we need to discuss implications further let me know and I can call to discuss.

Thank you,

Jeff Steeber

Jeff Steeber | Williams | Environmental Specialist | Ohio River Supply Hub
Office: 304-843-3125| Cell: 304-650-4741 | 100 Teletech Drive, Moundsville WV 26041

From: McKeone, Beverly D <beverly.d.mckeone@wv.gov>
Sent: Thursday, August 1, 2024 7:54 AM
To: Barron, Sarah K <sarah.k.barron@wv.gov>; Kees, Roy F <roy.f.kees@wv.gov>; Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Beverly D McKeone <beverly.d.mckeone@wv.gov>
Subject: [EXTERNAL] Re: Miller CS - Flare PTE Correction

[Quoted text hidden]

Barron, Sarah K <sarah.k.barron@wv.gov>

Miller CS - Flare PTE Correction

McKeone, Beverly D <beverly.d.mckeone@wv.gov> Thu, Aug 1, 2024 at 7:53 AM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>, "Kees, Roy F" <roy.f.kees@wv.gov>, "Steeber, Jeff" <jeff.steeber@williams.com>
Cc: Beverly D McKeone <beverly.d.mckeone@wv.gov>

Please have Mr. Steeber contact Roy Kees to discuss the issues.

Emissions from the combustor may decrease, but other streams (which are currently accounted for in the combustor) will increase. So more information would be required in order to advise on the permitting process.

Bev

[Quoted text hidden]

--
Beverly D. McKeone
NSR Program Manager
681-313-9077 (Mobile)
304-926-0499 Ext 41280 (Desk)

WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Barron, Sarah K <sarah.k.barron@wv.gov>

Miller CS - Flare PTE Correction

Barron, Sarah K <sarah.k.barron@wv.gov> Wed, Jul 31, 2024 at 4:11 PM
To: Beverly D McKeone <beverly.d.mckeone@wv.gov>, "Steeber, Jeff" <Jeff.Steeber@williams.com>

Hi Bev,

I'm working on the initial Title V permit for Appalachia Midstream Services, LLC's Miller Compressor Station (051-00130). They're going to revise the underlying NSR permit as discussed in the forwarded message. Could you let me know which type of permit revision this would need? Please let me know if you need any further information.

Thanks for your help,
- Sarah

---------- Forwarded message ---------
From: **Steeber, Jeff** <Jeff.Steeber@williams.com>
Date: Wed, Jul 31, 2024 at 3:49 PM
Subject: RE: Miller CS - Flare PTE Correction
To: Barron, Sarah K <sarah.k.barron@wv.gov>

Good Afternoon Sarah,

Appalachia Midstream Services, LLC (AMS) is seeking a revision to Miller Compressor Station Permit R13-2831G. Permit Condition 6.1.5 which contains incorrect emission limits for the process flare as it reflects the dehydrators flash tank offgas and still vent streams routed to the control device whereas only the flash tank offgas streams are controlled by the flare. As the permit revision will result in a decrease in potential to emit, a Class I administrative amendment is sought to accomplish the requested change. Please advise if AMS can pursue the requested permit change through a Class I administrative permit update.

Thank you,

Jeff

Barron, Sarah K <sarah.k.barron@wv.gov>

Miller CS - Flare PTE Correction

Steeber, Jeff <Jeff.Steeber@williams.com> Wed, Jul 31, 2024 at 3:49 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Good Afternoon Sarah,

Appalachia Midstream Services, LLC (AMS) is seeking a revision to Miller Compressor Station Permit R13-2831G. Permit Condition 6.1.5 which contains incorrect emission limits for the process flare as it reflects the dehydrators flash tank offgas and still vent streams routed to the control device whereas only the flash tank offgas streams are controlled by the flare. As the permit revision will result in a decrease in potential to emit, a Class I administrative amendment is sought to accomplish the requested change. Please advise if AMS can pursue the requested permit change through a Class I administrative permit update.

Thank you,

Jeff

[Quoted text hidden]

Barron, Sarah K <sarah.k.barron@wv.gov>

Miller CS - Flare PTE Correction

Steeber, Jeff <Jeff.Steeber@williams.com> Mon, Jul 29, 2024 at 4:25 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

We have reviewed the condition 6.5.1 values and have found an error in our calculations. The Miller flare emissions include the dehydrator still vent and flash tank emissions, so the VOC PTE is overstated. We are in the process of preparing an updated R13 application for submittal.

Thank you for bringing this to our attention.

Jeff Steeber

Jeff Steeber | Williams | Environmental Specialist | Ohio River Supply Hub
Office: 304-843-3125| Cell: 304-650-4741 | 100 Teletech Drive, Moundsville WV 26041

Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Permit - Miller Compressor Station; Application No. R30-05100130-2024

Steeber, Jeff <Jeff.Steeber@williams.com> Tue, Jul 9, 2024 at 10:54 AM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Sarah,

The address is 1781 Johnson Ridge, Cameron, WV 26033, I do not see an issue with adding the recordkeeping requirement for downtime hours associated with the VRU as this is something that is tracked internally as is.

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Tuesday, July 9, 2024 7:41 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: [EXTERNAL] Title V Permit - Miller Compressor Station; Application No. R30-05100130-2024

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Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Permit - Miller Compressor Station; Application No. R30-05100130-2024

Barron, Sarah K <sarah.k.barron@wv.gov> Tue, Jul 9, 2024 at 7:40 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Jeff,

I have a couple of further questions for the Miller Compressor Station's Title V permit:

Condition 8.1.4. of R13-2831G contains requirements for the VRU which captures emissions from the storage tanks. Paragraph b. includes that "The operational availability of the VRU system shall be 98% on a calendar year basis." Is there any issue with adding a recordkeeping requirement for any downtime hours associated with the VRU in order to demonstrate compliance with this requirement?

Could you confirm the city and zip code of the street address for the facility's physical location? The reported city and zip code are inconsistent in the Title V application and the DAQ's records.

Thanks,
- Sarah

--
Sarah Barron
Engineer Trainee
West Virginia Department of Environmental Protection
Division of Air Quality
(304) 414-1915
sarah.k.barron@wv.gov

Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Permit - Request for Information; Application No. R30-05100130-2024

Steeber, Jeff <Jeff.Steeber@williams.com> Thu, May 23, 2024 at 1:07 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

Here is the revised Miller Flare Maximum Incinerator Capacity – I used scfh (max) to calculate the lb/hr (max) – See Attached

770	lb/hr
0.385105	tons/hr
5.43	Factor F

2.09	**lb/hr**

[Quoted text hidden]

Miller Flare Loading.pdf
95K

Flare (FLR) Loading

Component	Molecular Weight lb/lb-mol	Component Btu/scf	Total Dehydrator Flash-Tank and Condensate Stabilizer By-Pass to FLR						Total Load to FLR		
			Elec Pump: 8,760 hr/yr	2,552 scfh (3 STL) 22.35 MMscfyr		Stab O/H 120 hr/yr	7,282 scfh (max) 0.87 MMscfyr		8,760 hr/yr	9,833 scfh (max)	
			Mole % (M% = V%)	Gas Btu/scf	lb/hr (max)	Mole % (M% = V%)	Gas Btu/scf	lb/hr (max)	Mole % (M% = V%)	Gas Btu/scf	lb/hr (max)
Water	18.015	---	3.42E-02	---	3.59E-02	5.25E-02	---	1.81E-01	3.44E-02	---	2.17E-01
Carbon Dioxide	44.010	---	9.37E-01	---	2.40E+00	2.58E-01	---	2.18E+00	9.28E-01	---	4.59E+00
Nitrogen	28.013	---	2.14E-01	---	3.49E-01	3.21E-02	---	1.73E-01	2.12E-01	---	5.22E-01
Methane*	16.042	1,010	6.34E+01	640.34	5.93E+01	3.36E+01	338.95	1.03E+02	6.30E+01	636.27	1.63E+02
Ethane*	30.069	1,770	2.43E+01	430.04	4.26E+01	3.12E+01	552.43	1.80E+02	2.44E+01	431.69	2.23E+02
Propane**	44.096	2,516	7.32E+00	184.19	1.88E+01	2.89E+01	727.13	2.45E+02	7.61E+00	191.52	2.63E+02
i-Butane**	58.122	3,252	9.92E-01	32.26	3.36E+00	1.79E+00	58.34	2.00E+01	1.00E+00	32.61	2.34E+01
n-Butane**	58.122	3,262	1.75E+00	57.09	5.93E+00	2.56E+00	83.42	2.85E+01	1.76E+00	57.45	3.44E+01
Cyclopentane**	70.100	3,764	---	---	---	---	---	---	---	---	---
i-Pentane**	72.149	4,001	3.80E-01	15.20	1.60E+00	6.03E-01	24.14	8.35E+00	3.83E-01	15.32	9.95E+00
n-Pentane**	72.149	4,009	3.41E-01	13.67	1.43E+00	4.79E-01	19.21	6.63E+00	3.43E-01	13.75	8.07E+00
Cyclohexane**	84.162	4,482	1.10E-02	0.49	5.40E-02	---	---	---	1.09E-02	0.49	5.40E-02
Other Hexanes**	86.175	4,750	1.98E-01	9.41	9.95E-01	---	---	---	1.95E-01	9.28	9.95E-01
Methylcyclohexane**	98.186	5,216	1.54E-02	0.80	8.81E-02	---	---	---	1.52E-02	0.79	8.81E-02
Heptanes**	100.205	5,503	5.92E-02	3.26	3.46E-01	1.45E-01	7.97	2.79E+00	6.04E-02	3.32	3.13E+00
C8+ Heavies**	138.00 est.	7,000	3.79E-03	0.27	3.05E-02	9.20E-03	0.64	2.43E-01	3.86E-03	0.27	2.74E-01
Benzene***	78.112	3,742	2.42E-03	0.09	1.10E-02	4.32E-05	1.6E-03	6.47E-04	2.39E-03	0.09	1.17E-02
Ethylbenzene***	106.165	5,222	1.07E-04	0.01	6.62E-04	1.31E-03	6.8E-02	2.66E-02	1.23E-04	0.01	2.73E-02
n-Hexane***	86.175	4,756	8.42E-02	4.00	4.23E-01	3.50E-01	16.64	5.79E+00	8.78E-02	4.18	6.21E+00
Methanol***	32.042	867	1.53E+01	132.64	2.86E+01	2.00E-03	1.7E-02	1.23E-02	1.51E+01	130.84	2.86E+01
Toluene***	92.138	4,475	1.80E-03	0.08	9.67E-03	5.93E-04	2.7E-02	1.05E-02	1.78E-03	0.08	2.02E-02
2,2,4-TMP (i-Octane)***	114.229	6,214	9.34E-04	0.06	6.22E-03	4.39E-02	2.73	9.63E-01	1.51E-03	0.09	9.69E-01
Xylenes***	106.165	5,209	3.79E-03	0.20	2.35E-02	1.87E-03	0.10	3.82E-02	3.76E-03	0.20	2.16E-02
			115.35	Btu/scf	lb/hr (max)	100.00	Btu/scf	lb/hr (max)	115.14	Btu/scf	lb/hr (max)
				1,524	166.39		1,832	603.82		1,528	770.21
				MMBtu/hr (max)			MMBtu/hr (max)			Base Load - MMBtu/hr	
				3.89			13.34			15.03	
										Add Purge/Pilot - MMBtu/hr	
										0.18	
										Add Contingency - MMBtu/hr	
										0.63	
										Total Load - MMBtu/hr	
										15.84	
										Round-Up - MMBtu/hr	
										16.00	

Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Permit - Request for Information; Application No. R30-05100130-2024

Steeber, Jeff <Jeff.Steeber@williams.com> Tue, May 21, 2024 at 9:08 AM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

According to the Flare Manufacturer Data - Max. Mass Flow Rate: 125,000 lbs/hr

125,000	lb/hr
62.5	tons/hr
2.72	Factor F

170	**lb/hr**

Please let me know if you have any questions or concerns regarding this value.

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Monday, April 22, 2024 11:04 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-05100130-2024

Hi, Jeff.

[Quoted text hidden]

Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Permit - Request for Information; Application No. R30-05100130-2024

Steeber, Jeff <Jeff.Steeber@williams.com> Mon, May 6, 2024 at 2:00 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

Requests 1 & 2 - Find the updated pages attached.

Request 3 – The flare is subject to the particulate matter emissions limit of 45CSR§6-4.1. – Will provide maximum incinerator capacity (lbs/hr) by the end of the week.

Request 4 – OOOOb Applicability – Compressors and Fugitives **NOT** subject to OOOOb – Will remain subject to OOOOa

- Per 40 CFR 60.2 Commenced means, with respect to the definition of new source in section 111(a)(2) of the Act, that an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

In this case, the compressor replacements at the Miller CS commenced construction before December 6, 2022. This commencement is substantiated by purchase orders with Bidell for the 7044 engines and associated equipment, dated October 2022, indicating a contractual obligation. At this time there is no OOOOb subject equipment located at the Miller CS- subject to change pending any future modifications submitted to the WVDAQ.

Please let me know if you have further questions or concerns.

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Monday, April 22, 2024 11:04 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-05100130-2024

Hi, Jeff.

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Miller-TVOP Renew Application-Replacement Pages-042624.pdf
2199K

Appalachia Midstream Services, LLC

Miller Compressor Station

Application for 45CSR30 Title V Operating Permit

Facility-Wide Potential to Emit (PTE) [Tons per Year]

Unit ID	Point ID	Source ID	Description	NOX	CO	VOC (w/HCHO)	HCHO	TOTAL HAPs	TOTAL CO2e
Miller Compressor Station - Point Sources									
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	5.50	10.82	0.85	0.22	0.63	8,646
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	6.48	7.92	0.76	0.10	0.19	7,287
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	5.50	10.82	0.85	0.22	0.63	8,646
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	6.48	7.92	0.76	0.10	0.19	7,287
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	6.48	7.92	0.76	0.10	0.19	7,287
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	---	---	18.17	---	0.78	2,205
EUCRP	EPCRP	CRP	Compressor Rod Packing	---	---	21.81	---	0.93	2,647
EUESU	EPESU	ESU	Engine Start-up	---	---	6.57	---	0.28	797
EUECC	EPECC	ECC	Engine Crankcase	0.20	1.07	0.38	0.17	0.20	253
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	2.10	5.78	0.61	0.09	0.13	13,315
EUDFT-1	EPDFT-1	DFT-1	Dehydrator 01 - Flash Tank	---	---	1.33	---	0.07	62
EUDSV-1	EPDSV-1	DSV-1	Dehydrator 01 - Still Vent	---	---	6.42	---	2.05	15
EUDFT-2	EPDFT-2	DFT-2	Dehydrator 02 - Flash Tank	---	---	1.33	---	0.07	62
EUDSV-2	EPDSV-2	DSV-2	Dehydrator 02 - Still Vent	---	---	6.42	---	2.05	15
EUDFT-3	EPDFT-3	DFT-3	Dehydrator 03 - Flash Tank	---	---	1.33	---	0.07	62
EUDSV-3	EPDSV-3	DSV-3	Dehydrator 03 - Still Vent	---	---	6.42	---	2.05	15
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	0.43	0.36	0.02	0.00	0.01	512.89
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	0.43	0.36	0.02	0.00	0.01	512.89
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	0.43	0.36	0.02	3E-04	0.01	512.89
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	---	---	0.44	---	0.01	3.72
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	1.44	1.21	0.08	1E-03	0.03	1718.18
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	---	---	1.11	---	0.10	5.69
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	---	---	0.10	---	0.01	0.52
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	---	---	13.34	---	0.20	---
		WLOR	Truck Loading - Produced Fluid/Water (PW)	---	---	0.18	---	3E-04	---
EUPIG	EPPIG	PIG	Pigging Operations	---	---	0.63	---	0.03	76.03
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	2.15	6.79	0.12	0.00	0.04	2591.78
			Miller Compressor Station - Point Sources	**77.61**	**101.30**	**122.05**	**9.26**	**22.31**	**116,012**
Miller Compressor Station - Fugitives									
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	---	---	3.19	---	0.14	387
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	---	---	5.97	---	0.52	---
			Miller Compressor Station - Fugitives	**---**	**---**	**9.16**	**---**	**0.65**	**387**
Miller Compressor Station - Total									
			Miller Compressor Station - Total	**77.61**	**101.30**	**131.21**	**9.26**	**22.97**	**116,399**

Important Notes: Title V Operating Permit (TVOP) Applicability:

* Criteria pollutant fugitives are **not included** in TVOP major source determinations because the facility is not a listed source category.
* Hazardous air pollutant (HAP) fugitives are **always included** in TVOP major source determinations.
* Greenhouse gases (GHG) are **not included** in TVOP major source determinations.

1 - Emissions based on 100% of rated load for 8,760 hr/yr, including Compressor Blowdown (CBD), Truck Load-Out (TLO), Pigging Operations (PIG), and Flare-01 (FLR-01), each with intermittent operations.
2 - VOC is volatile organic compounds, as defined by EPA, includes HCHO (formaldehyde).
3 - HCHO is formaldehyde and is the individual HAP with the highest PTE.
4 - Total HAP is total hazardous air pollutants, including, but not limited to: acetaldehyde, acrolein, benzene, ethylbenzene, formaldehyde (HCHO), n-hexane, methanol (MeOH), toluene, 2,2,4-trimethylpentane (2,2,4-TMP or i-octane), and xylenes.
5 - CO2e is aggregated Greenhouse Gas (GHG) emissions, comprised of: carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O), as adjusted for Global Warming Potential (GWP).

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) .

Please Reference WVDEP-DAQ Permit R13-2831G
(Also SUPPLEMENT S2 – Regulatory Discussion)

☐

☑ **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.)

Please Reference WVDEP-DAQ Permit R13-2831G
(Also SUPPLEMENT S2 – Regulatory Discussion)

☐

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)**

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)**
R13-2831G	**01/16/2024**	**na**

22. Inactive Permits/Obsolete Permit Conditions		
Permit Number	**Date of Issuance**	**Permit Condition Number**
R13-2831F	**01/10/2023**	**na**
R13-2831E	**01/21/2016**	**na**
R13-2831D	**09/24/2012**	**na**
R13-2831C	**2012-2010**	**na**
R13-2831B	**2012-2010**	**na**
R13-2831A	**2012-2010**	**na**
R13-2831	**09/09/2010**	**na**

23. Facility-Wide Emissions Summary [Tons per Year] - Reference SUPPLEMENT 03 – Emission Calculations	
Criteria Pollutants	**Potential Emissions**
Carbon Monoxide (CO)	**101.30**
Nitrogen Oxides (NOx)	**77.61**
Lead (Pb)	**---**
Particulate Matter (PM2.5)[1]	**9.44**
Particulate Matter (PM10)[1]	**9.44**
Total Particulate Matter (TSP)	**9.44**
Sulfur Dioxide (SO2)	**0.44**
Volatile Organic Compounds (VOC)	**131.21**
Hazardous Air Pollutants[2]	**Potential Emissions**
Acetaldehyde	**1.62**
Acrolein	**1.07**
Benzene	**1.00**
Butadiene, 1,3-	**0.10**
Ethylbenzene	**0.36**
Fornaldehyde (HCHO	**9.26**
Hexane, n-	**2.23**
Methanol (MeOH)	**2.46**
Polycyclic Organic Matter (POM/PAH)	**0.09**
Toluene	**1.20**
TMP, 2,2,4- (i-Octane)	**0.26**
Xylenes	**3.25**
Other/Trace HAP*	**0.07**
TOTAL HAPs	**22.97**
Regulated Pollutants other than Criteria and HAP	**Potential Emissions**
Carbon Dioxide (CO_2)	**99,518**
Nitrous Oxide (N_2O)	**0.54**
Methane (CH_4)	**668.81**
CO_2 equivalent (CO_2e)	**116,399**

[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.*

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

Attachment D - Title V Equipment Table

(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 24 of the General Forms)

Emission Unit ID[1]	Emission Point ID[1]	Emission Unit Description	Year Installed	Design Capacity	Control Device[1]
EUCE-2	EPCE-2	Compressor Engine 02 - Waukesha L7044 GSI	2023	1,900 bhp	NSCR-02
EUCE-3	EPCE-3	Compressor Engine 03 - Waukesha L5794 GSI	2010	1,380 bhp	NSCR-03
EUCE-4	EPCE-4	Compressor Engine 04 - Waukesha L7044 GSI	2023	1,900 bhp	NSCR-04
EUCE-5	EPCE-5	Compressor Engine 05 - Waukesha L5794 GSI	2010	1,380 bhp	NSCR-05
EUCE-6	EPCE-6	Compressor Engine 06 - Waukesha L5794 GSI	2010	1,380 bhp	NSCR-06
EUCE-7	EPCE-7	Compressor Engine 07 - CAT G3516B	2012	1,380 bhp	OxCat -07
EUCE-8	EPCE-8	Compressor Engine 08 - CAT G3516B	2012	1,380 bhp	OxCat -08
EUCE-12	EPCE-12	Compressor Engine 12 - CAT G3516B	2017	1,380 bhp	OxCat -12
EUCE-13	EPCE-13	Compressor Engine 13 - CAT G3516B	2017	1,380 bhp	OxCat -13
EUCE-14	EPCE-14	Compressor Engine 14 - CAT G3516B	2017	1,380 bhp	OxCat -14
EUCE-15	EPCE-15	Compressor Engine 15 - CAT G3516B	2017	1,380 bhp	OxCat -15
EUBD	EPBD	Compressor Blowdown/Emergency Shutdown Tests	2010	574 Events/yr	---
EUCRP	EPCRP	Compressor Rod Packing	2010	11 Units	---
EUESU	EPESU	Engine Start-up	2010	11 Units	---
EUECC	EPECC	Engine Crankcase	2010	11 Units	---
EUGEN-1	EPGEN-1	Microturbine Generator-01 - Capstone C600	2010	805 bhp	---
EUDFT-1	EPDFT-1	Dehydrator 01 - Flash Tank	2010	55 MMscfd	FLR
EUDSV-1	EPDSV-1	Dehydrator 01 - Still Vent	2010	55 MMscfd	Cond/Comb
EUDFT-2	EPDFT-2	Dehydrator 02 - Flash Tank	2010	55 MMscfd	FLR
EUDSV-2	EPDSV-2	Dehydrator 02 - Still Vent	2010	55 MMscfd	Cond/Comb
EUDFT-3	EPDFT-3	Dehydrator 03 - Flash Tank	2010	55 MMscfd	FLR
EUDSV-3	EPDSV-3	Dehydrator 03 - Still Vent	2010	55 MMscfd	Cond/Comb
EURBL-1	EPRBL-1	Reboiler 01	2010	1.0 MMBtu/hr	---
EURBL-2	EPRBL-2	Reboiler 02	2010	1.0 MMBtu/hr	---
EURBL-3	EPRBL-3	Reboiler 03	2010	1.0 MMBtu/hr	---
EUSTAB	EPSTAB	Condensate Stabilizer - Bypass to Flare	2010	120 hr/yr	FLR
EUOH-1	EPHOH-1	Hot Oil Heater - Condensate Stabilizer	2010	3.35 MMBtu/hr	---
EUTK-1-12	EPTK-1-12	Storage Tank 01-10 - Stabilized Condensate (SC)	2010	4,000 bbl (total)	VRU
		Storage Tank 11-12 - Produced Fluid/Water (PW)	2010	800 bbl (total)	
EULOR	EPLOR	Truck Loading - Stabilized Condensate (SC)	2010	11,498 Mgal/yr	CarbCan
		Truck Loading - Produced Fluid/Water (PW)	2010	1,533 Mgal/yr	
EUPIG	EPPIG	Pigging Operations	2010	624 Events/yr	---
APCFLARE	APCFLARE	Dehydrator/Stabilizer Flare (Combustion Only)	2010	5.0 MMBtu/hr	---
EUFUG	EPFUG	Piping & Equip Leaks - Gas/Vapor	2010	7,472 Units	LDAR
		Piping & Equip Leaks - Light Liquid/Oil	2010	2,271 Units	

[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 Form

Emission Unit Description		EUDFT-1/EUDSV-1, EUDFT-2/EUDSV-2, EUDFT-3/EUDSV-3
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
EUDFT-1/EUDSV-1, EUDFT-2/EUDSV-2, EUDFT-3/EUDSV-3	**3 x 55.0 MMscfd Dehydrators**	**BTEX-01 thru BTEX-03, FLR**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Three (3) Dehydrators are utilized at the facility. Each dehydrator is comprised of a Contactor/Absorber Tower (no vented emissions), a Flash Tank (98% Flare Control), and a Regenerator/Still Vent BTEX Buster (95% Control).

Manufacturer:	**Model number:**	**Serial number(s):**
NATCO	**55.0 MMscfd**	**---**
Construction date:	**Installation date:**	**Modification date(s):**
na	**2010**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

55.0 MMscfd (each)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
2.29 MMscf/hr (each)	**20,075 MMscf/yr (each)**	**8,760 hr/yr (each)**

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ___ Yes _X_No	**If yes, is it?** ___ Indirect ___ Direct
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	**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 Unit Description	EUDFT-1/EUDSV-1, EUDFT-2/EUDSV-2, EUDFT-3/EUDSV-3	
Criteria Pollutants	**Pollutant Emissions**	
	PPH (each)	**TPY (each)**
Carbon Monoxide (CO)	---	---
Nitrogen Oxides (NOX)	---	---
Lead (Pb)	---	---
Particulate Matter (PM2.5)	---	---
Particulate Matter (PM10)	---	---
Total Particulate Matter (TSP)	---	---
Sulfur Dioxide (SO2)	---	---
Volatile Organic Compounds (VOC)	**1.86**	**7.75**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH (each)	**TPY (each)**
Acetaldehyde	---	---
Acrolein	---	---
Benzene	**0.05**	**0.21**
Butadiene, 1,3-	---	---
Ethylbenzene	**0.01**	**0.03**
Formaldehyde	---	---
Hexane, n-	**0.05**	**0.24**
Methanol	**0.18**	**0.39**
POM/PAH	---	---
Toluene	**0.07**	**0.29**
TMP, 2,2,4-	**2E-03**	**4E-03**
Xylenes	**0.44**	**0.97**
Other/Trace HAP	---	---
Total HAP	**0.80**	**2.12**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH (each)	**TPY (each)**
Carbon Dioxide (CO2)	**2.28**	**9.97**
Methane (CH4) (GWP=25)	**0.61**	**2.67**
Nitrous Oxide (N2O) (GWP=298)	---	---
CO2 Equivalent (CO2e)	**17.50**	**76.63**

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

GRI-GLYCalc, Extended Gas Analysis, and Operation Records

Please reference Supplement S3 - Emission Calculations
Also Supplement S6 - Emission Programs

Emission Unit Description **EUDFT-1/EUDSV-1, EUDFT-2/EUDSV-2, EUDFT-3/EUDSV-3**

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.

Please Reference WVDEP-DAQ Permit R13-2831G
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

6.1.1. Maximum Throughput Limitation. The maximum dry natural gas throughput to each of the glycol dehydration units shall not exceed the following:

Emission Unit ID#	Emission Point ID#	Emission Unit	Design Capacity
EUDFT-1/ EUDSV-1	EPDFT-1/ EPDSV-1	Dehy Flash Tank Vent Controlled by Flare; Dehy Still Vent Controlled by Condenser/Reboiler	55 MMscfd
EUDFT-2/ EUDSV-2	EPDFT-2/ EPDSV-2	Dehy Flash Tank Vent Controlled by Flare; Dehy Still Vent Controlled by Condenser/Reboiler	55 MMscfd
EUDFT-3/ EUDSV-3	EPDFT-3/ EPDSV-3	Dehy Flash Tank Vent Controlled by Flare; Dehy Still Vent Controlled by Condenser/Reboiler	55 MMscfd

6.1.2. The still vent of each dehydration unit shall be vented to a dedicated BTEX Condenser through a closed vent system. The non-condensable gas shall be vented back to the respective reboiler though a closed vent system. The control device(s) shall be operated according to manufacturer's specifications, and shall be properly maintained in a manner which prevents the unit from freezing.

6.1.3. *Condensers.* The permittee shall comply with the requirements below:

a. The still vent of each dehydration unit shall be routed to a dedicated BTEX Condenser and BTEX Accumulator (2-phase separator) though a closed vent system. The non-condensable gas from each BTEX Accumulator shall be vented back to the respective reboiler though a closed vent system.

b. Each glycol dehydration unit/still column (EPDSV-1, EPDSV-2, & EPDSV-3) shall be equipped with a fully functional BTEX Buster (APCCOND-1, APCCOND-2, and APCOND-3) at all times. The control device(s) (APCCOND-1, APCCOND-2, and APCCOND-3) shall be operated according to manufacturer's specifications, and shall be properly maintained in a manner which prevents the unit from freezing.

c. The non-condensable gas from the BTEX Accumulator shall be routed to the reboiler and combusted though a closed vent system.

d. The flash tank off-gases from each flash tank shall be routed to a flash gas header to the facility flare or to the inlet separator of the station for re-processing. The routing of the flash tank off-gases shall be done through a closed vent system.

e. The pilot light for each reboiler burner shall be lit at all times when the dehydration unit is in operation.

f. The maximum flow rate of glycol through each dehydration unit shall not exceed 15 gpm. The unit be operated either with an electric or gas pneumatic driven pumps that does not exceed the above flow rate.

g. The BTEX Condenser shall be operated in a manner to prevent liquids carryover to the respective reboiler

h. The system shall be constructed of hard piping

i. The system shall be constructed and maintained free of leaks.

j. Detected leaks shall be addressed in accordance with the applicable fugitive emission requirements specified in 40 CFR Part 60, Subpart OOOOa.

[45CSR§13-5.10.]

Emission Unit Description	EUDFT-1/EUDSV-1, EUDFT-2/EUDSV-2, EUDFT-3/EUDSV-3
_X_ Permit Shield	
For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)**	
Please Reference WVDEP-DAQ Permit R13-2831G **(Also SUPPLEMENT S2 – Regulatory Discussion)** **There are no requested changes**	
Are you in compliance with all applicable requirements for this emissions unit? If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.	☑ **Yes** ☐ No **(Not Applicable)**

Appalachia Midstream Services, LLC

Miller Compressor Station

Application for 45CSR30 Title V Operating Permit

Attachment G

Air Pollution Control Device Form

Emission Unit Description		**Dehydrator/Stabilizer Flare**
Control device ID number:	**List all emission units associated with this control device.**	
FLR	**DFT-1, DFT-2, DFT-3 and STAB**	
Manufacturer:	**Model Number:**	**Installation Date:**
na	**na**	**2010**

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: _____
___ 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
VOC	**100%**	**98.0%**
VHAP	**100%**	**98.0%**

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

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

If Yes, Complete Attachment H

If No, Provide justification: na

Supplement S3 - Emission Calculations and Supplement S5 Vendor Data.

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

Presence of a pilot flame is continuously monitored by a thermocouple or equivalent device.

identified within the natural gas production segment and each compressor commenced construction after 09/18/15 (§60.5360a and §60.5365a(c)).

Requirements may include:

a. Replacing rod packing systems on a specified schedule (§60.5385a(a)),
b. Demonstrate initial and continuous compliance (§60.5385a(b,c), and
c. Perform reporting and recordkeeping (§60.5385a(d)).

This rule does not apply to the fugitive emission components because while the facility is identified within the Crude Oil and Natural Gas Production source category (SIC Major Group 13), there has been no increase in horsepower at the station after September 18, 2015 (§60.5360a and §60.5397a).

This rule does not apply to the Stabilized Condensate Storage Tanks (TK-01 thru TK-10) nor to the Produced Water Storage Tanks (WTK-11 and WTK-12) (nor any other tank) because each tank does not have the potential to emit more than 6 tpy of VOCs. Note, however, there is a requirement to document that the VOC PTE is less than 6 tpy per tank (§60.5420).

This rule does not apply to the pneumatic controllers because they are compressed air driven, otherwise they have a bleed rate ≤ 6 scfh, and are not located at a natural gas processing plant (§60.5365a(d)(1)).

Other requirements of this rule do not apply because the facility is a) not a well, b) does not have a centrifugal compressor using wet seals, and c) does not have a process unit associated with the processing of natural gas.

13. NSPS OOOOb - Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022

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

This rule does not apply. This facility does not contain equipment that would be an affected facility under this rule.

C. Applicability of National Emission Standards for Hazardous Air Pollutants (NESHAP)

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

1. NESHAP Part 61 - Designated Source Standards

40CFR§61.01-§61.359 [Not Applicable]

This rule does not apply because the is no equipment, operation, or pollutant emission sources at the subject facility that is subject to the requirements of NESHAP Part 61. (Please reference E.2-NESHAP J and E.3-NESHAP V, below.)

2. NESHAP J - Equipment Leaks (Fugitive Emission Sources) of Benzene

40CFR§61.110-§61.112 [Not Applicable]

This rule does not apply to the Process Piping and Equipment Leaks (FUG) because all the fluids (liquid or gas) at the subject facility contain less than 10 percent benzene by weight (§61.111)

3. **NESHAP V - Equipment Leaks (Fugitive Emission Sources)**
   40CFR§61.240-110-§61.247 [Not Applicable]

   This rule does not apply to the Process Piping and Equipment Leaks (FUG) because all fluids (liquid or gas) at the subject facility contain less than 10 wt% volatile hazardous air pollutants (VHAP) (40CFR§61.245(d)(1)).

4. **NESHAP Part 63 (aka: MACT) - General Provisions**
   40CFR§63.1-§63.16 [Not Applicable]

   This rule does not apply because the is no equipment, operation, or pollutant emission sources at the facility that is subject to the requirements of NESHAP Part 63. (Please reference E.5-NESHAP HH and E.8-NESHAP ZZZZ, below.)

5. **NESHAP HH, Oil and Natural Gas Production Facilities**
   40CFR§63.760-§63.779 [Applicable/Exempt]]

   This rule does apply to the Dehydrators (DFT-1/DSV-1 thru DFT-3/DSV-3); however, because the facility is an area source of HAP emissions and the actual average emissions of benzene from each glycol dehydration unit process vent to the atmosphere is less than 0.90 megagram per year (1.0 tpy), the only requirement is to maintain records of the actual average benzene emissions per year (§63.774(d)(1)(i)).

   This rule does not apply to storage vessels (tanks), compressors, or ancillary equipment because the facility is an area source of HAP emissions (§63.760(b)(2)).

   In no case does this rule apply to engines or turbines.

6. **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)).

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

   This rule does not apply because the facility is not a major source of HAP emissions (§63.6080).

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

   This rule does apply to the Compressor Engines (CE-02 thru CE-08 and CE-12 thru CE-15). However, because each engine is “new” (i.e., commenced construction or reconstruction on or after 06/12/06) (§63.6590(a)(2)(iii)); the only requirement is compliance with §60.4230-§60.4248 (NSPS JJJJ) for Spark Ignition Internal Combustion Engines.

9. **NESHAP DDDDD, Industrial, Commercial, and Institutional Boilers and Process Heaters – Major Sources**
   40CFR§63.7480 – §63.7575 [Not Applicable]

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

10. NESHAP CCCCCC - Gasoline Dispensing Facilities (GDF)

40CFR§63.11111 [Not Applicable]

This rule does not apply because the subject facility does not dispense gasoline into the fuel tank of a motor vehicle, motor vehicle engine, nonroad vehicle, or nonroad engine (§63.11111 (a)).

11. NESHAP JJJJJJ, Industrial, Commercial, and Institutional Boilers – Area Sources

40CFR§63.11193 – §63.11237 [Not Applicable]

This rule does not apply because the gas-fired Reboilers (RBL-01 thru RBL-03) do not meet the definition of "boiler" in §63.11237. Specifically, "boiler" is defined as an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam and/or hot water. Furthermore, waste heat boilers, process heaters, and autoclaves are excluded from the definition of "boiler".

D. Compliance Assurance Monitoring (CAM)

40CFR§64.1-§64.10 [Potentially Applicable/Deferred]

This rule may apply to the Dehydrators (DFT-1/DSV-1 thru DFT-3/DSV-3) controlled by STL/STAB Flare (FLR). However, because the pre-control emissions exceed 100 TPY and the post-control emissions of each "pollutant specific emission unit (PSEU)" is less than the Title V Major Source Threshold, the creation and implementation of a Compliance Assurance Monitoring (CAM) plan is deferred until submission of an application for renewal of the Title V Operating Permit (§64.5(a,b)).

This rule does not apply to Compressor Engines (CE-02 thru CE-08, and CE-12 thru CE-15) because they are subject to NSPS JJJJ (§64.2(b)).

This rule does not apply to any other PSEU at the facility because none have potential pre-controlled emissions equal or greater than the applicable Title V Major Source Thresholds (§64.2(a)(3)).

E. Chemical Accident Prevention Provisions (Risk Management Plan (RMP))

440CFR§68.1-§68.220 [Not Applicable]

This rule does not apply because the subject facility does not store more than a threshold quantity of a regulated substance in a process. Specifically, "[P]rior to entry into a natural gas processing plant or a petroleum refining process unit, regulated substances in naturally occurring hydrocarbon mixtures need not be considered when determining whether more than a threshold quantity is present at a stationary source" (§68.115(b)(2)(iii)).

G. Applicability of State Regulations

The following state regulations are potentially applicable to natural gas compressor stations. 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 reboilers (RBL-01 thru RBL-03) and Hot Oil Heater (OH-01); however, because the reboilers and heater each have a maximum design heat input (MDHI) rating less than 10 MMBtu/hr, the only requirement is to limit visible emissions to less than 10% opacity during normal operations (§45-02-3.1). The reboilers and heater combust only natural gas which inherently conforms to the visible emission standards.

2. **Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors (State Only)**
   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.

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

   This rule does apply to the STL/STAB Flare (FLR); however, this unit combusts waste from natural gas operations which inherently conforms to the particulate emission and opacity standards.

4. **Prevent and Control Air Pollution from the Emission of Sulfur Oxides**
   45CSR10 [Not Applicable]

   This rule does not apply to the Compressor Engines (CE-02 thru CE-08, and CE-12 thru CE15), Reboilers (RBL-01 thru RBL-03, STL/STAB Flare (FLR), or any other fuel burning unit, manufacturing process sources, or combustion source at the facility because each combust only natural gas (45-10A-3.1.b).

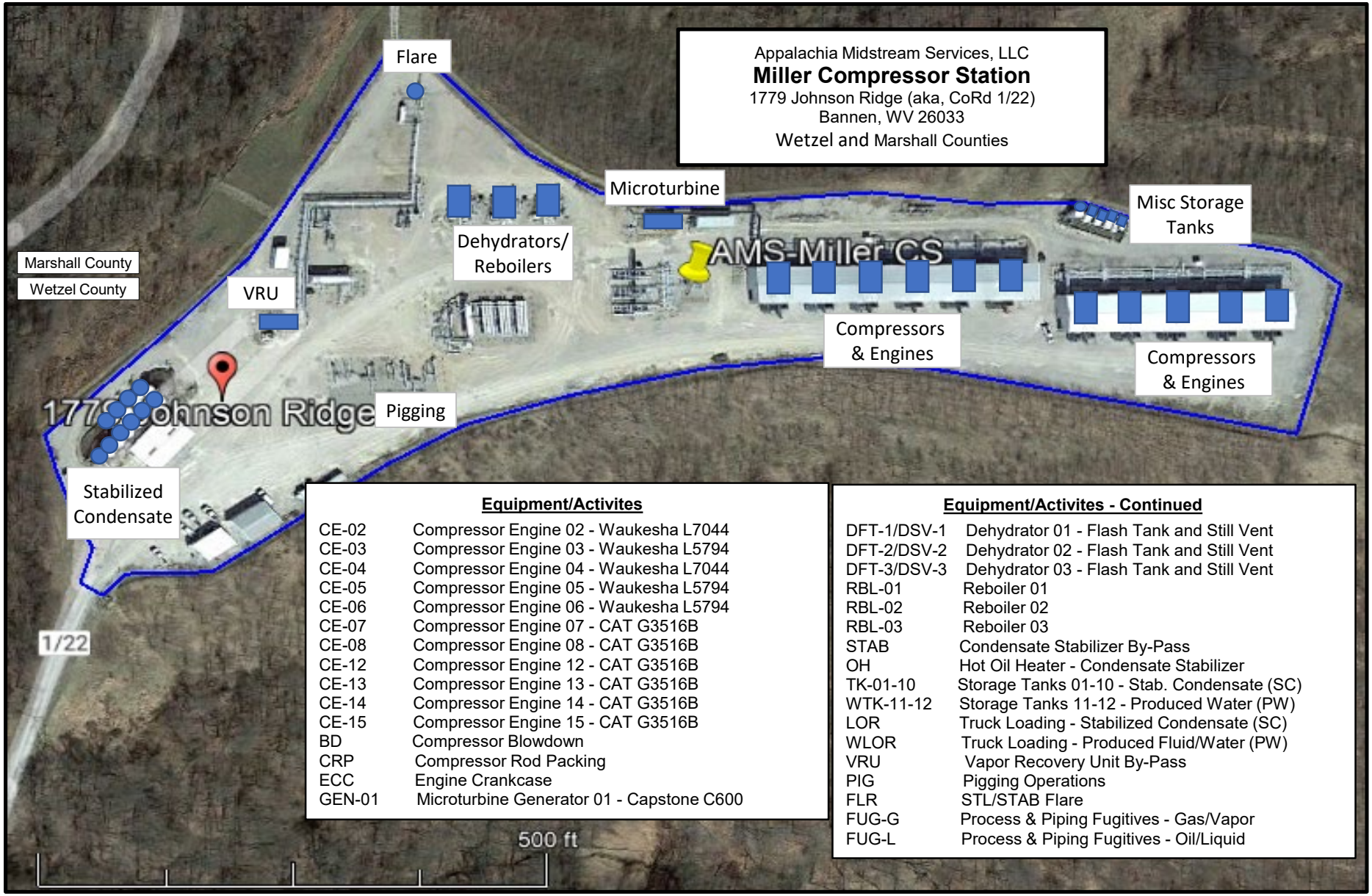
5. **Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation**
   45CSR13 [Applicable]

   This rule does apply. The facility is currently operating under 45CSR13 NSR Class II Administrative Update Construction Permit R13-2831G, issued January 16, 2024.

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

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

Attachment B
Plot Plan / Aerial View



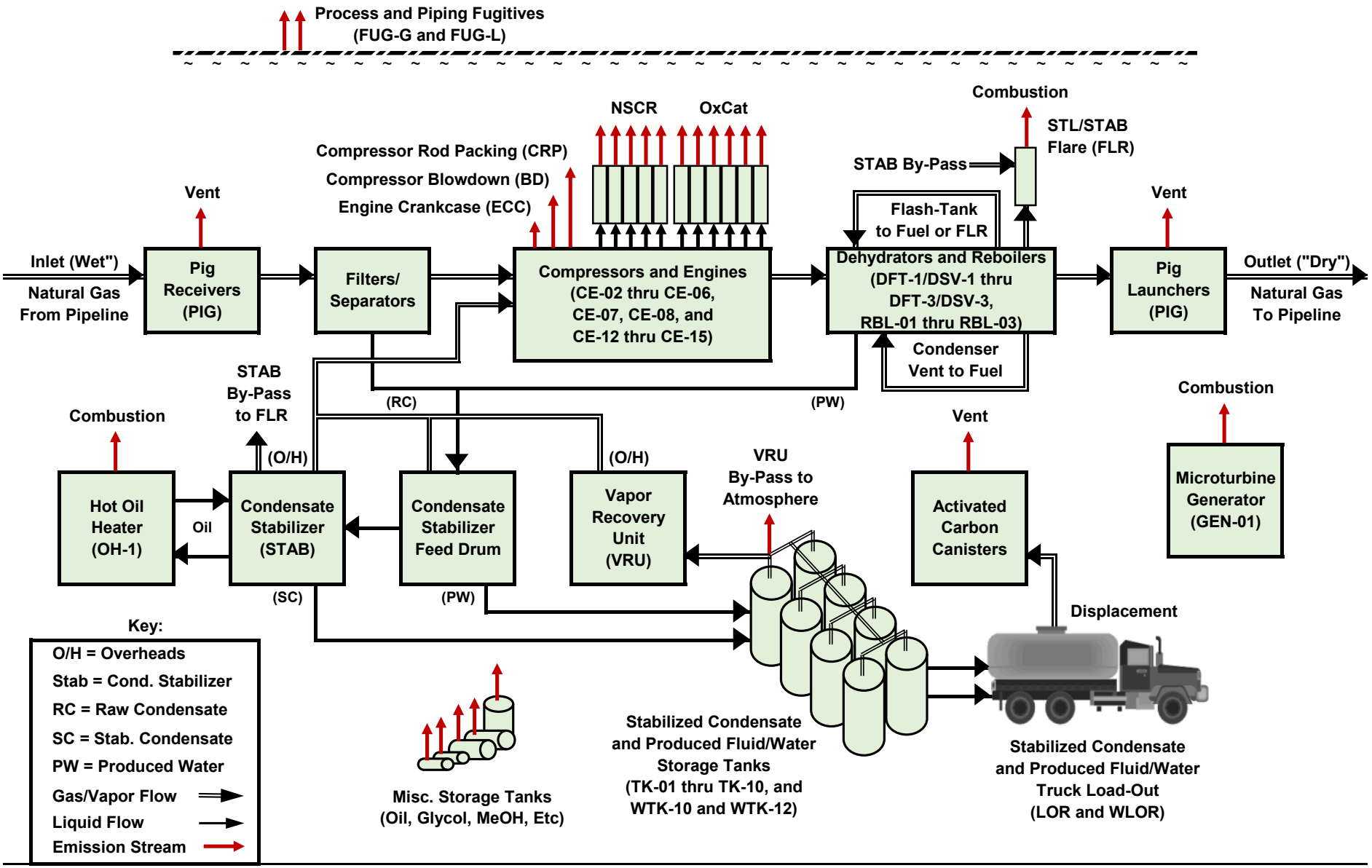
Equipment/Activites

CE-02	Compressor Engine 02 - Waukesha L7044
CE-03	Compressor Engine 03 - Waukesha L5794
CE-04	Compressor Engine 04 - Waukesha L7044
CE-05	Compressor Engine 05 - Waukesha L5794
CE-06	Compressor Engine 06 - Waukesha L5794
CE-07	Compressor Engine 07 - CAT G3516B
CE-08	Compressor Engine 08 - CAT G3516B
CE-12	Compressor Engine 12 - CAT G3516B
CE-13	Compressor Engine 13 - CAT G3516B
CE-14	Compressor Engine 14 - CAT G3516B
CE-15	Compressor Engine 15 - CAT G3516B
BD	Compressor Blowdown
CRP	Compressor Rod Packing
ECC	Engine Crankcase
GEN-01	Microturbine Generator 01 - Capstone C600

Equipment/Activites - Continued

DFT-1/DSV-1	Dehydrator 01 - Flash Tank and Still Vent
DFT-2/DSV-2	Dehydrator 02 - Flash Tank and Still Vent
DFT-3/DSV-3	Dehydrator 03 - Flash Tank and Still Vent
RBL-01	Reboiler 01
RBL-02	Reboiler 02
RBL-03	Reboiler 03
STAB	Condensate Stabilizer By-Pass
OH	Hot Oil Heater - Condensate Stabilizer
TK-01-10	Storage Tanks 01-10 - Stab. Condensate (SC)
WTK-11-12	Storage Tanks 11-12 - Produced Water (PW)
LOR	Truck Loading - Stabilized Condensate (SC)
WLOR	Truck Loading - Produced Fluid/Water (PW)
VRU	Vapor Recovery Unit By-Pass
PIG	Pigging Operations
FLR	STL/STAB Flare
FUG-G	Process & Piping Fugitives - Gas/Vapor
FUG-L	Process & Piping Fugitives - Oil/Liquid

Attachment C
Process Flow Diagram (PFD)



Supplement S3

Emission Calculations

Criteria Pollutants - Controlled

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	NOX		CO		VOC (w/HCHO)		PM10/2.5		SO2	
							lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
Miller Compressor Station - Point Sources																
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	1.26	5.50	2.47	10.82	0.20	0.85	0.30	1.32	0.01	0.04
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	1.48	6.48	1.81	7.92	0.17	0.76	0.20	0.88	0.01	0.03
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	1.26	5.50	2.47	10.82	0.20	0.85	0.30	1.32	0.01	0.04
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	1.48	6.48	1.81	7.92	0.17	0.76	0.20	0.88	0.01	0.03
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	1.48	6.48	1.81	7.92	0.17	0.76	0.20	0.88	0.01	0.03
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	---	---	---	4.15	18.17	---	---	---	---
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	---	---	---	4.98	21.81	---	---	---	---
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	---	---	---	1.50	6.57	---	---	---	---
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	0.04	0.20	0.24	1.07	0.09	0.38	3E-03	0.01	2E-04	9E-04
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	0.48	2.10	1.32	5.78	0.14	0.61	0.18	0.79	0.02	0.07
EUDFT-1	EPDFT-1	DFT-1	Dehydrator 01 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	0.32	1.33	---	---	---	---
EUDSV-1	EPDSV-1	DSV-1	Dehydrator 01 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	1.54	6.42	---	---	---	---
EUDFT-2	EPDFT-2	DFT-2	Dehydrator 02 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	0.32	1.33	---	---	---	---
EUDSV-2	EPDSV-2	DSV-2	Dehydrator 02 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	1.54	6.42	---	---	---	---
EUDFT-3	EPDFT-3	DFT-3	Dehydrator 03 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	0.32	1.33	---	---	---	---
EUDSV-3	EPDSV-3	DSV-3	Dehydrator 03 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	1.54	6.42	---	---	---	---
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	---	---	---	0.10	0.44	---	---	---	---
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	0.33	1.44	0.28	1.21	0.02	0.08	0.02	0.11	2E-03	0.01
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	---	---	---	0.25	1.11	---	---	---	---
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)	VRU	8,760	---	---	---	---	0.02	0.10	---	---	---	---
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	3.05	13.34	---	---	---	---
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	0.04	0.18	---	---	---	---
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	---	---	---	0.14	0.63	---	---	---	---
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	0.49	2.15	1.55	6.79	0.03	0.12	0.04	0.16	3E-03	0.01
			Miller Compressor Station - Point Sources				**17.72**	**77.61**	**23.13**	**101.30**	**28.13**	**122.05**	**2.16**	**9.44**	**0.10**	**0.44**
Miller Compressor Station - Fugitives																
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	---	---	---	0.73	3.19	---	---	---	---
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units	LDAR	8,760	---	---	---	---	1.36	5.97	---	---	---	---
			Miller Compressor Station - Fugitives				**---**	**---**	**---**	**---**	**2.09**	**9.16**	**---**	**---**	**---**	**---**
Miller Compressor Station - Total																
			Miller Compressor Station - Total				**17.72**	**77.61**	**23.13**	**101.30**	**30.22**	**131.21**	**2.16**	**9.44**	**0.10**	**0.44**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

	NOX		CO		VOC (w/HCHO)		PM10/2.5		SO2	
	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
Current Permit Total	**---**	**77.61**	**---**	**101.30**	**---**	**131.21**	**---**	**9.44**	**---**	**0.44**
Increase/(Decrease)	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**
% Change	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**

lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
NOX		**CO**		**VOC (w/HCHO)**		**PM10/2.5**		**SO2**	

Hazardous Air Pollutants (HAP) - Controlled - Page 01 of 02

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	Acetaldehyde		Acrolein		Benzene		Butadiene, 1,3-		Ethylbenzene		HCHO		n-Hexane	
							lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Miller Compressor Station - Point Sources																				
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	0.02	0.09	0.02	0.09	0.01	0.05	5E-03	0.02	2E-04	8E-04	0.05	0.22	---	---
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	4E-03	0.02	4E-03	0.02	3E-03	0.01	1E-03	5E-03	4E-05	2E-04	0.02	0.10	---	---
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	0.02	0.09	0.02	0.09	0.01	0.05	0.01	0.02	2E-04	8E-04	0.05	0.22	---	---
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	4E-03	0.02	4E-03	0.02	3E-03	0.01	1E-03	5E-03	4E-05	2E-04	0.02	0.10	---	---
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	4E-03	0.02	4E-03	0.02	3E-03	0.01	1E-03	5E-03	4E-05	2E-04	0.02	0.10	---	---
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	---	---	---	0.01	0.06	---	---	0.01	0.06	---	---	0.06	0.28
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	---	---	---	0.02	0.07	---	---	0.02	0.07	---	---	0.08	0.33
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	---	---	---	5E-03	0.02	---	---	5E-03	0.02	---	---	0.02	0.10
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	3E-03	0.01	2E-03	0.01	1E-04	6E-04	9E-05	4E-04	1E-05	6E-05	0.04	0.17	4E-04	2E-03
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	1E-03	5E-03	2E-04	8E-04	3E-04	1E-03	1E-05	5E-05	9E-04	4E-03	0.02	0.09	---	---
EUDFT-1	EPDFT-1	DFT-1	Dehydrator 01 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	1E-04	4E-04	---	---	7E-06	3E-05	---	---	4E-03	0.02
EUDSV-1	EPDSV-1	DSV-1	Dehydrator 01 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	0.05	0.21	---	---	0.01	0.03	---	---	0.05	0.22
EUDFT-2	EPDFT-2	DFT-2	Dehydrator 02 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	1E-04	4E-04	---	---	7E-06	3E-05	---	---	4E-03	0.02
EUDSV-2	EPDSV-2	DSV-2	Dehydrator 02 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	0.05	0.21	---	---	0.01	0.03	---	---	0.05	0.22
EUDFT-3	EPDFT-3	DFT-3	Dehydrator 03 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	1E-04	4E-04	---	---	7E-06	3E-05	---	---	4E-03	0.02
EUDSV-3	EPDSV-3	DSV-3	Dehydrator 03 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	0.05	0.21	---	---	0.01	0.03	---	---	0.05	0.22
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	---	---	---	5E-05	2E-04	---	---	5E-05	2E-04	---	---	2E-03	0.01
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	---	---	---	---	7E-06	3E-05	---	---	---	---	2E-04	1E-03	0.01	0.03
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	---	---	---	1E-04	5E-04	---	---	3E-03	0.01	---	---	0.01	0.05
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	---	---	---	---	1E-05	5E-05	---	---	3E-04	1E-03	---	---	1E-03	5E-03
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	9E-04	4E-03	---	---	9E-04	4E-03	---	---	0.03	0.15
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	1E-05	5E-05	---	---	1E-05	5E-05	---	---	5E-05	2E-04
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	---	---	---	4E-04	2E-03	---	---	4E-04	2E-03	---	---	2E-03	0.01
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	---	---	---	---	1E-05	5E-05	---	---	---	---	4E-04	2E-03	0.01	0.04
Miller Compressor Station - Point Sources							**0.37**	**1.62**	**0.25**	**1.07**	**0.22**	**0.98**	**0.02**	**0.10**	**0.06**	**0.27**	**2.11**	**9.26**	**0.44**	**1.91**
Miller Compressor Station - Fugitives																				
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	---	---	---	2E-03	0.01	---	---	2E-03	0.01	---	---	0.01	0.05
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	---	---	---	---	7E-04	3E-03	---	---	0.02	0.08	---	---	0.06	0.28
Miller Compressor Station - Fugitives							**---**	**---**	**---**	**---**	**3E-03**	**0.01**	**---**	**---**	**0.02**	**0.08**	**---**	**---**	**0.07**	**0.33**
Miller Compressor Station - Total																				
Miller Compressor Station - Total							**0.37**	**1.62**	**0.25**	**1.07**	**0.23**	**1.00**	**0.02**	**0.10**	**0.08**	**0.36**	**2.11**	**9.26**	**0.51**	**2.23**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

	Acetaldehyde		Acrolein		Benzene		Butadiene, 1,3-		Ethylbenzene		HCHO		n-Hexane	
	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Current Permit Total	**0.37**	**1.62**	**0.25**	**1.07**	**0.09**	**1.00**	**0.02**	**0.10**	**0.06**	**0.36**	**2.11**	**9.26**	**0.36**	**2.23**
Increase/(Decrease)	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**
% Change	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**

Hazardous Air Pollutants (HAP) - Controlled - Page 02 of 02

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	Methanol		POM		Toluene		TMP, 2,2,4-		Xylenes		Other HAP		TOTAL HAPs	
							lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Miller Compressor Station - Point Sources																				
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	0.02	0.10	2E-03	0.01	4E-03	0.02	---	---	2E-03	0.01	1E-03	0.01	**0.14**	**0.63**
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	5E-03	0.02	4E-04	2E-03	9E-04	4E-03	---	---	3E-04	1E-03	3E-04	1E-03	**0.04**	**0.19**
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-05	8,760	0.02	0.10	2E-03	0.01	4E-03	0.02	---	---	2E-03	0.01	1E-03	0.01	**0.14**	**0.63**
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	5E-03	0.02	4E-04	2E-03	9E-04	4E-03	---	---	3E-04	1E-03	3E-04	1E-03	**0.04**	**0.19**
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	5E-03	0.02	4E-04	2E-03	9E-04	4E-03	---	---	3E-04	1E-03	3E-04	1E-03	**0.04**	**0.19**
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	0.05	0.22	---	---	0.01	0.06	0.01	0.06	0.01	0.06	---	---	**0.18**	**0.78**
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	0.06	0.27	---	---	0.02	0.07	0.02	0.07	0.02	0.07	---	---	**0.21**	**0.93**
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	0.02	0.08	---	---	5E-03	0.02	5E-03	0.02	5E-03	0.02	---	---	**0.06**	**0.28**
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	8E-04	4E-03	1E-04	5E-04	1E-04	6E-04	8E-05	4E-04	6E-05	3E-04	1E-04	5E-04	**0.05**	**0.20**
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	---	---	9E-04	4E-03	4E-03	0.02	---	---	2E-03	8E-03	8E-04	3E-03	**0.03**	**0.13**
EUDFT-1	EPDFT-1	DFT-1	Dehydrator 01 - Flash Tank	55 MMscfd	FLR	8,760	0.02	0.05	---	---	9E-05	4E-04	7E-06	3E-05	1E-04	6E-04	---	---	**0.03**	**0.07**
EUDSV-1	EPDSV-1	DSV-1	Dehydrator 01 - Still Vent	55 MMscfd	Cond/Comb	8,760	0.15	0.33	---	---	0.07	0.29	8E-04	3E-03	0.22	0.97	---	---	**0.55**	**2.05**
EUDFT-2	EPDFT-2	DFT-2	Dehydrator 02 - Flash Tank	55 MMscfd	FLR	8,760	0.02	0.05	---	---	9E-05	4E-04	7E-06	3E-05	1E-04	6E-04	---	---	**0.03**	**0.07**
EUDSV-2	EPDSV-2	DSV-2	Dehydrator 02 - Still Vent	55 MMscfd	Cond/Comb	8,760	0.15	0.33	---	---	0.07	0.29	8E-04	3E-03	0.22	0.97	---	---	**0.55**	**2.05**
EUDFT-3	EPDFT-3	DFT-3	Dehydrator 03 - Flash Tank	55 MMscfd	FLR	8,760	0.02	0.05	---	---	9E-05	4E-04	7E-06	3E-05	1E-04	6E-04	---	---	**0.03**	**0.07**
EUDSV-3	EPDSV-3	DSV-3	Dehydrator 03 - Still Vent	55 MMscfd	Cond/Comb	8,760	0.15	0.33	---	---	0.07	0.29	8E-04	3E-03	0.22	0.97	---	---	**0.55**	**2.05**
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	**2E-03**	**0.01**
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	**2E-03**	**0.01**
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	**2E-03**	**0.01**
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	5E-05	2E-04	---	---	---	---	3E-04	2E-03	5E-05	2E-04			**2E-03**	**0.01**
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	---	---	2E-06	1E-05	1E-05	5E-05	---	---	---	---	4E-06	2E-05	**0.01**	**0.03**
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	8E-05	4E-04	---	---	2E-03	0.01	0.00	0.005	4E-03	0.02	---	---	**0.02**	**0.10**
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	8E-06	3E-05	---	---	1E-04	6E-04	1E-04	4E-04	4E-04	2E-03	---	---	**2E-03**	**0.01**
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	9E-04	4E-03	---	---	0.00	0.00	0.01	0.03	9E-04	4E-03	---	---	**0.04**	**0.20**
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			1E-06	5E-06	---	---	1E-06	5E-06	9E-06	4E-05	1E-06	5E-06	---	---	**6E-05**	**3E-04**
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	2E-03	0.01	---	---	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	---	---	**0.01**	**0.03**
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	---	---	3E-06	1E-05	2E-05	7E-05	---	---	---	---	6E-06	3E-05	**0.01**	**0.04**
			Miller Compressor Station - Point Sources				**0.82**	**2.42**	**0.02**	**0.09**	**0.26**	**1.15**	**0.05**	**0.23**	**0.72**	**3.14**	**0.02**	**0.07**	**5.36**	**22.31**
Miller Compressor Station - Fugitives																				
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	0.01	0.04	---	---	2E-03	0.01	2E-03	0.01	2E-03	0.01	---	---	0.03	0.14
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	4E-04	2E-03	---	---	0.01	0.04	0.01	0.03	0.02	0.10	---	---	0.12	0.52
			Miller Compressor Station - Fugitives				**0.01**	**0.04**	**---**	**---**	**0.01**	**0.05**	**0.01**	**0.04**	**0.02**	**0.11**	**---**	**---**	**0.15**	**0.65**
Miller Compressor Station - Total																				
			Miller Compressor Station - Total				**0.83**	**2.46**	**0.02**	**0.09**	**0.27**	**1.20**	**0.06**	**0.26**	**0.74**	**3.25**	**0.02**	**0.07**	**5.51**	**22.97**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

Current Permit Total	**0.38**	**2.46**	**0.02**	**0.09**	**0.08**	**1.20**	**0.07**	**0.26**	**0.08**	**3.25**	**0.02**	**0.07**	**3.91**	**22.97**
Increase/(Decrease)	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**
% Change	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Methanol		**POM**		**Toluene**		**TMP, 2,2,4-**		**Xylenes**		**Other HAP**		**TOTAL HAPs**	

Greenhouse Gas (GHG) Pollutants - Controlled

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr*	Heat Input (HHV) MMBtu/hr	CO2 GWP: 1 tpy	CO2e 1 tpy	CH4 GWP: 25 tpy	CO2e 25 tpy	N2O GWP: 298 tpy	CO2e 298 tpy	TOTAL CO2e lb/hr*	TOTAL CO2e tpy
Miller Compressor Station - Point Sources															
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	15.54	8,531	8,531	4.40	110	0.02	4.47	**1,974**	**8,646**
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	15.54	8,531	8,531	4.40	110	0.02	4.47	**1,974**	**8,646**
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	0.66	0.66	88.18	2,204	---	---	**503.46**	**2,205**
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	0.80	0.80	105.85	2,646	---	---	**604.35**	**2,647**
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	0.24	0.24	31.87	796.80	---	---	**181.97**	**797.04**
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	---	207.34	207.34	1.84	45.88	3E-04	0.10	**57.83**	**253.32**
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	---	13,182	13,182	1.04	25.89	0.36	107.14	**3,040**	**13,315**
EUDFT-1	EPDFT-1	DFT-1	Dehydrator 01 - Flash Tank	55 MMscfd	FLR	8,760	---	4.63	4.63	2.28	57.09	---	---	**14.09**	**61.72**
EUDSV-1	EPDSV-1	DSV-1	Dehydrator 01 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	5.34	5.34	0.38	9.57	---	---	**3.40**	**14.91**
EUDFT-2	EPDFT-2	DFT-2	Dehydrator 02 - Flash Tank	55 MMscfd	FLR	8,760	---	4.63	4.63	2.28	57.09	---	---	**14.09**	**61.72**
EUDSV-2	EPDSV-2	DSV-2	Dehydrator 02 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	5.34	5.34	0.38	9.57	---	---	**3.40**	**14.91**
EUDFT-3	EPDFT-3	DFT-3	Dehydrator 03 - Flash Tank	55 MMscfd	FLR	8,760	---	4.63	4.63	2.28	57.09	---	---	**14.09**	**61.72**
EUDSV-3	EPDSV-3	DSV-3	Dehydrator 03 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	5.34	5.34	0.38	9.57	---	---	**3.40**	**14.91**
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	0.15	0.15	0.14	3.57	---	---	**0.85**	**3.72**
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	3.35	1,716	1,716	0.03	0.81	3E-03	0.96	**392.28**	**1,718**
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	0.23	0.23	0.22	5.46	---	---	**1.30**	**5.69**
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	---	0.02	0.02	0.02	0.50	---	---	**0.12**	**0.52**
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	---	---	---	**---**	**---**
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	---	---	---	**---**	**---**
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	0.02	0.02	3.04	76.01	---	---	**17.36**	**76.03**
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	5.00	2,576	2,576	0.05	1.23	0.05	14.08	**591.73**	**2,592**
			Miller Compressor Station - Point Sources				**141.63**	**99,518**	**99,518**	**653.34**	**16,333**	**0.54**	**160.62**	**26,487**	**116,012**
Miller Compressor Station - Fugitives															
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	0.12	0.12	15.47	386.81	---	---	**88.34**	**386.93**
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	---	---	---	---	---	---	---	**---**	**---**
			Miller Compressor Station - Fugitives				**---**	**0.12**	**0.12**	**15.47**	**386.81**	**---**	**---**	**88.34**	**386.93**
Miller Compressor Station - Total															
			Miller Compressor Station - Total				**141.63**	**99,518**	**99,518**	**668.81**	**16,720**	**0.54**	**160.62**	**26,575**	**116,399**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

Current Permit Total	**99,518**	**99,518**	**668.81**	**16,720**	**0.54**	**160.62**	**26,575**	**116,399**
Increase/(Decrease)	**0**	**0**	**0.00**	**0**	**0.00**	**0.00**	**0**	**0**
% Change	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**

tpy	tpy	tpy	tpy	tpy	tpy	lb/hr*	tpy
CO2	**CO2e**	**CH4**	**CO2e**	**N2O**	**CO2e**	**TOTAL CO2e**	

Criteria Pollutants - Pre-Controlled

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	NOX		CO		VOC (w/HCHO)		PM10/2.5		SO2	
							lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Miller Compressor Station - Point Sources																
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	48.34	211.72	40.34	176.68	0.50	2.19	0.30	1.32	0.01	0.04
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	42.29	185.23	26.77	117.27	1.12	4.91	0.20	0.88	0.01	0.03
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	48.34	211.72	40.34	176.68	0.50	2.19	0.30	1.32	0.01	0.04
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	42.29	185.23	26.77	117.27	1.12	4.91	0.20	0.88	0.01	0.03
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	42.29	185.23	26.77	117.27	1.12	4.91	0.20	0.88	0.01	0.03
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	---	---	---	4.15	18.17	---	---	---	---
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	---	---	---	4.98	21.81	---	---	---	---
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	---	---	---	1.50	6.57	---	---	---	---
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	0.04	0.20	0.24	1.07	0.09	0.38	3E-03	0.01	2E-04	9E-04
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	0.48	2.10	1.32	5.78	0.14	0.61	0.18	0.79	0.02	0.07
EUDFT-1	EPDFT-1	DFT-1	Dehydrator 01 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	15.06	64.89	---	---	---	---
EUDSV-1	EPDSV-1	DSV-1	Dehydrator 01 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	36.13	151.56	---	---	---	---
EUDFT-2	EPDFT-2	DFT-2	Dehydrator 02 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	15.06	64.89	---	---	---	---
EUDSV-2	EPDSV-2	DSV-2	Dehydrator 02 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	36.13	151.56	---	---	---	---
EUDFT-3	EPDFT-3	DFT-3	Dehydrator 03 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	15.06	64.89	---	---	---	---
EUDSV-3	EPDSV-3	DSV-3	Dehydrator 03 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	36.13	151.56	---	---	---	---
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	---	---	---	5.01	21.94	---	---	---	---
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	0.33	1.44	0.28	1.21	0.02	0.08	0.02	0.11	2E-03	0.01
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	---	---	---	12.67	55.51	---	---	---	---
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	---	---	---	---	1.27	5.55	---	---	---	---
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	9.09	39.81	---	---	---	---
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	0.12	0.53	---	---	---	---
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	---	---	---	0.14	0.63	---	---	---	---
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	No Pre-Controlled Emissions from the Flare									
			Miller Compressor Station - Point Sources				**233.82**	**1,024**	**212.55**	**931**	**214.64**	**916.91**	**2.12**	**9.28**	**0.10**	**0.42**
Miller Compressor Station - Fugitives																
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	---	---	---	3.10	13.60	---	---	---	---
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	---	---	---	---	4.97	21.78	---	---	---	---
			Miller Compressor Station - Fugitives				**---**	**---**	**---**	**---**	**8.08**	**35.38**	**---**	**---**	**---**	**---**
Miller Compressor Station - Total																
			Miller Compressor Station - Total				**233.82**	**1,024**	**212.55**	**931**	**222.72**	**952.29**	**2.12**	**9.28**	**0.10**	**0.42**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
NOX		**CO**		**VOC (w/HCHO)**		**PM10/2.5**		**SO2**	

Hazardous Air Pollutants (HAP) - Pre-Controlled - Page 01 of 02

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	Acetaldehyde		Acrolein		Benzene		Butadiene, 1,3-		Ethylbenzene		HCHO		n-Hexane	
							lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Miller Compressor Station - Point Sources																				
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	0.04	0.19	0.04	0.18	0.02	0.11	0.01	0.05	4E-04	2E-03	0.21	0.92	---	---
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	0.03	0.13	0.03	0.12	0.02	0.07	0.01	0.03	3E-04	1E-03	0.15	0.67	---	---
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	0.04	0.19	0.04	0.18	0.02	0.11	0.01	0.05	4E-04	2E-03	0.21	0.92	---	---
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	0.03	0.13	0.03	0.12	0.02	0.07	0.01	0.03	3E-04	1E-03	0.15	0.67	---	---
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	0.03	0.13	0.03	0.12	0.02	0.07	0.01	0.03	3E-04	1E-03	0.15	0.67	---	---
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	---	---	---	0.01	0.06	---	---	0.01	0.06	---	---	0.06	0.28
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	---	---	---	0.02	0.07	---	---	0.02	0.07	---	---	0.08	0.33
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	---	---	---	5E-03	0.02	---	---	5E-03	0.02	---	---	0.02	0.10
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	3E-03	0.01	2E-03	0.01	1E-04	6E-04	9E-05	4E-04	1E-05	6E-05	0.04	0.17	4E-04	2E-03
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	1E-03	5E-03	2E-04	8E-04	3E-04	1E-03	1E-05	5E-05	9E-04	4E-03	2E-02	9E-02	---	---
EUDFT-1	EPDFT-1	DFT-1	Dehydrator 01 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	5E-03	0.02	---	---	3E-04	2E-03	---	---	0.19	0.82
EUDSV-1	EPDSV-1	DSV-1	Dehydrator 01 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	1.02	4.48	---	---	0.22	0.95	---	---	1.04	4.57
EUDFT-2	EPDFT-2	DFT-2	Dehydrator 02 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	5E-03	0.02	---	---	3E-04	2E-03	---	---	0.19	0.82
EUDSV-2	EPDSV-2	DSV-2	Dehydrator 02 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	1.02	4.48	---	---	0.22	0.95	---	---	1.04	4.57
EUDFT-3	EPDFT-3	DFT-3	Dehydrator 03 - Flash Tank	55 MMscfd	FLR	8,760	---	---	---	---	5E-03	0.02	---	---	3E-04	2E-03	---	---	0.19	0.82
EUDSV-3	EPDSV-3	DSV-3	Dehydrator 03 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	---	---	---	1.02	4.48	---	---	0.22	0.95	---	---	1.04	4.57
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	---	---	---	2E-03	0.01			2E-03	0.01			0.09	0.40
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	---	---	---	---	7E-06	3E-05	---	---	---	---	2E-04	1E-03	0.01	0.03
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	---	---	---	0.01	0.03	---	---	0.16	0.70	---	---	0.59	2.57
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	---	---	---	---	6E-04	2E-03	---	---	0.01	0.06	---	---	0.05	0.24
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	3E-03	0.01	---	---	3E-03	0.01	---	---	0.10	0.44
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	4E-05	5E-05	---	---	4E-05	5E-05	---	---	1E-04	2E-04
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	---	---	---	4E-04	2E-03	---	---	4E-04	2E-03	---	---	2E-03	0.01
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	No Pre-Controlled Emissions from the Flare													
				Miller Compressor Station - Point Sources			**0.75**	**3.27**	**0.52**	**2.26**	**3.25**	**14.25**	**0.06**	**0.26**	**0.87**	**3.81**	**8.78**	**38.47**	**4.78**	**20.92**
Miller Compressor Station - Fugitives																				
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	---	---	---	0.01	0.04	---	---	0.01	0.04	---	---	0.05	0.21
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	---	---	---	---	2E-03	0.01	---	---	0.06	0.27	---	---	0.23	1.01
				Miller Compressor Station - Fugitives			**---**	**---**	**---**	**---**	**0.01**	**0.05**	**---**	**---**	**0.07**	**0.32**	**---**	**---**	**0.28**	**1.22**
Miller Compressor Station - Total																				
				Miller Compressor Station - Total			**0.75**	**3.27**	**0.52**	**2.26**	**3.27**	**14.30**	**0.06**	**0.26**	**0.94**	**4.12**	**8.78**	**38.47**	**5.05**	**22.13**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Acetaldehyde		Acrolein		Benzene		Butadiene, 1,3-		Ethylbenzene		HCHO		n-Hexane	

Hazardous Air Pollutants (HAP) - Pre-Controlled - Page 02 of 02

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	Methanol		POM		Toluene		TMP, 2,2,4-		Xylenes		Other HAP		TOTAL HAPs	
							lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Miller Compressor Station - Point Sources																				
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	0.05	0.21	4E-03	0.02	0.01	0.04	---	---	3E-03	0.01	3E-03	0.01	0.39	1.73
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	0.03	0.14	2E-03	0.01	0.01	0.03	---	---	2E-03	0.01	2E-03	0.01	0.28	1.21
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	0.05	0.21	4E-03	0.02	0.01	0.04	---	---	3E-03	0.01	3E-03	0.01	0.39	1.73
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	0.03	0.14	2E-03	0.01	0.01	0.03	---	---	2E-03	0.01	2E-03	0.01	0.28	1.21
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	0.03	0.14	2E-03	0.01	0.01	0.03	---	---	2E-03	0.01	2E-03	0.01	0.28	1.21
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	0.05	0.22	---	---	0.01	0.06	0.01	0.06	0.01	0.06	---	---	0.18	0.78
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	0.06	0.27	---	---	0.02	0.07	0.02	0.07	0.02	0.07	---	---	0.21	0.93
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	0.02	0.08	---	---	5E-03	0.02	5E-03	0.02	5E-03	0.02	---	---	0.06	0.28
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	8E-04	4E-03	1E-04	5E-04	1E-04	6E-04	8E-05	4E-04	6E-05	3E-04	1E-04	5E-04	0.05	0.20
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	---	---	9E-04	4E-03	4E-03	2E-02	---	---	2E-03	8E-03	8E-04	3E-03	3E-02	0.13
EUDFT-1	EPDFT-1	DFT-1	Dehydrator 01 - Flash Tank	55 MMscfd	FLR	8,760	0.42	0.91	---	---	4E-03	0.02	3E-03	0.01	0.01	0.03	---	---	0.62	1.81
EUDSV-1	EPDSV-1	DSV-1	Dehydrator 01 - Still Vent	55 MMscfd	Cond/Comb	8,760	2.66	5.82	---	---	1.60	7.02	0.02	0.07	7.04	30.84	---	---	13.60	53.75
EUDFT-2	EPDFT-2	DFT-2	Dehydrator 02 - Flash Tank	55 MMscfd	FLR	8,760	0.42	0.91	---	---	4E-03	0.02	3E-03	0.01	0.01	0.03	---	---	0.62	1.81
EUDSV-2	EPDSV-2	DSV-2	Dehydrator 02 - Still Vent	55 MMscfd	Cond/Comb	8,760	2.66	5.82	---	---	1.60	7.02	0.02	0.07	7.04	30.84	---	---	13.60	53.75
EUDFT-3	EPDFT-3	DFT-3	Dehydrator 03 - Flash Tank	55 MMscfd	FLR	8,760	0.42	0.91	---	---	4E-03	0.02	3E-03	0.01	0.01	0.03	---	---	0.62	1.81
EUDSV-3	EPDSV-3	DSV-3	Dehydrator 03 - Still Vent	55 MMscfd	Cond/Comb	8,760	2.66	5.82	---	---	1.60	7.02	0.02	0.07	7.04	30.84	---	---	13.60	53.75
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	2E-03	0.01
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	2E-03	0.01
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	2E-03	0.01
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	2E-03	0.01	---	---	2E-03	1E-02	2E-02	8E-02	2E-03	1E-02	---	---	0.12	0.54
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	---	---	2E-06	1E-05	1E-05	5E-05	---	---	---	---	4E-06	2E-05	0.01	0.03
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	4E-03	0.02	---	---	0.08	0.35	0.05	0.24	0.21	0.91	---	---	1.10	4.81
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	4E-04	2E-03	---	---	0.01	0.03	5E-03	0.02	0.02	0.08	---	---	0.10	0.44
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	3E-03	0.01	---	---	3E-03	0.01	0.02	0.08	3E-03	0.01	---	---	0.13	0.59
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			1E-06	5E-06	---	---	1E-06	5E-06	9E-06	4E-05	1E-06	5E-06	---	---	6E-05	3E-04
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	2E-03	0.01	---	---	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	---	---	0.01	0.03
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	No Pre-Controlled Emissions from the Flare													
			Miller Compressor Station - Point Sources				**9.72**	**22.38**	**0.04**	**0.18**	**5.02**	**21.97**	**0.21**	**0.90**	**21.43**	**93.87**	**0.03**	**0.15**	**55.45**	**222.68**
Miller Compressor Station - Fugitives																				
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	0.04	0.17	---	---	0.01	0.04	0.01	0.04	0.01	0.04	---	---	0.13	0.58
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	2E-03	0.01	---	---	0.03	0.14	0.02	0.09	0.08	0.36	---	---	0.43	1.89
			Miller Compressor Station - Fugitives				**0.04**	**0.17**	**---**	**---**	**0.04**	**0.18**	**0.03**	**0.14**	**0.09**	**0.40**	**---**	**---**	**0.56**	**2.47**
Miller Compressor Station - Total																				
			Miller Compressor Station - Total				**9.76**	**22.55**	**0.04**	**0.18**	**5.06**	**22.15**	**0.24**	**1.03**	**21.52**	**94.27**	**0.03**	**0.15**	**56.01**	**225.15**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Methanol		POM		Toluene		TMP, 2,2,4-		Xylenes		Other HAP		TOTAL HAPs	

Appalachia Midstream Services, LLC
Miller Compressor Station
Application for 45CSR30 Title V Operating Permit

Greenhouse Gas (GHG) Pollutants - Pre-Controlled

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr*	Heat Input (HHV) MMBtu/hr	CO2 GWP: 1 tpy	CO2e 1 tpy	CH4 GWP: 25 tpy	CO2e 25 tpy	N2O GWP: 298 tpy	CO2e 298 tpy	TOTAL CO2e lb/hr*	TOTAL CO2e tpy
Miller Compressor Station - Point Sources															
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	15.54	8,531	8,531	4.40	110	0.02	4.47	**1,974**	**8,646**
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	15.54	8,531	8,531	4.40	110	0.02	4.47	**1,974**	**8,646**
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	0.66	0.66	88.18	2,204	---	---	**503.46**	**2,205**
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	0.80	0.80	105.85	2,646	---	---	**604.35**	**2,647**
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	0.24	0.24	31.87	796.80	---	---	**181.97**	**797.04**
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	---	207.34	207.34	1.84	45.88	3E-04	0.10	**57.83**	**253.32**
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	---	13,182	13,182	1.04	25.89	0.36	107.14	**3,040**	**13,315**
EUDFT-1	EPDFT-1	DFT-1	Dehydrator 01 - Flash Tank	55 MMscfd	FLR	8,760	---	4.63	4.63	114.18	2,854	---	---	**652.74**	**2,859**
EUDSV-1	EPDSV-1	DSV-1	Dehydrator 01 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	5.34	5.34	7.66	191.47	---	---	**44.93**	**196.81**
EUDFT-2	EPDFT-2	DFT-2	Dehydrator 02 - Flash Tank	55 MMscfd	FLR	8,760	---	4.63	4.63	114.18	2,854	---	---	**652.74**	**2,859**
EUDSV-2	EPDSV-2	DSV-2	Dehydrator 02 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	5.34	5.34	7.66	191.47	---	---	**44.93**	**196.81**
EUDFT-3	EPDFT-3	DFT-3	Dehydrator 03 - Flash Tank	55 MMscfd	FLR	8,760	---	4.63	4.63	114.18	2,854	---	---	**652.74**	**2,859**
EUDSV-3	EPDSV-3	DSV-3	Dehydrator 03 - Still Vent	55 MMscfd	Cond/Comb	8,760	---	5.34	5.34	7.66	191.47	---	---	**44.93**	**196.81**
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	0.15	0.15	7.13	178.31	---	---	**40.74**	**178.46**
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	3.35	1,716	1,716	0.03	0.81	3E-03	0.96	**392.28**	**1,718**
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	0.23	0.23	0.22	5.46	---	---	**1.30**	**5.69**
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	---	0.02	0.02	0.02	0.50	---	---	**0.12**	**0.52**
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	---	---	---	**---**	**---**
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	---	---	---	**---**	**---**
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	0.02	0.02	3.04	76.01	---	---	**17.36**	**76.03**
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	5.00	2,576	2,576	0.05	1.23	0.05	14.08	**591.73**	**2,592**
Miller Compressor Station - Point Sources							**141.63**	**99,518**	**99,518**	**1,017.83**	**25,446**	**0.54**	**160.62**	**28,567**	**125,124**
Miller Compressor Station - Fugitives															
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	0.12	0.12	65.99	1,650	---	---	**376.70**	**1,650**
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	---	---	---	---	---	---	---	**---**	**---**
Miller Compressor Station - Fugitives							**---**	**0.12**	**0.12**	**65.99**	**1,650**	**---**	**---**	**376.70**	**1,650**
Miller Compressor Station - Total															
Miller Compressor Station - Total							**141.63**	**99,518**	**99,518**	**1,083.82**	**27,096**	**0.54**	**160.62**	**28,944**	**126,774**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

Current Permit Total	**99,500**	**99,500**	**679.74**	**16,993**	**0.54**	**160.62**	**26,633**	**116,654**
Increase/(Decrease)	**18**	**18**	**404.09**	**10,102**	**0.00**	**0.00**	**2,310**	**10,120**
% Change	**0%**	**0%**	**59%**	**59%**	**0%**	**0%**	**9%**	**9%**

tpy	tpy	tpy	tpy	tpy	tpy	lb/hr*	tpy
CO2	**CO2e**	**CH4**	**CO2e**	**N2O**	**CO2e**	**TOTAL CO2e**	

Compressor Engine (CE-02 and CE-04)

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
CE-02 CE-04 (Each)	Compressor Engine 02 and 04 (Each) (NSCR-02 and NSCR-04) Waukesha L7044 GSI (4SRB) 1,900 bhp (Each) 8,760 hr/yr (Each) 1,200 rpm, 16 cyl 7,040 in3 Displacement 440 in3/cyl 1,136 Exhaust Temp (oF) 8,667 Exhaust Flow (acfm) Manufactured ≥ 07/01/10 NSPS JJJJ Affected 8,179 Btu/bhp-hr (HHV) 15.54 MMBtu/hr (HHV) (Each) 15,235 scf/hr (Each) 133.46 MMscf/yr (Each) 1,020 Btu/scf (HHV)	Vendor Data	NOX	11.54	3.11	48.34	211.72	97.4%	0.30	**1.26**	**5.50**
		Vendor Data	CO	9.63	2.60	40.34	176.68	93.9%	0.59	**2.47**	**10.82**
		Vendor Data	NMNEHC	0.05	0.01	0.21	0.90	50.0%	0.025	**0.10**	**0.45**
		Sum	VOC (w/Aldehyde)	0.35	0.03	0.50	2.19	86.7%	0.05	**0.20**	**0.85**
		AP-42 Table 3.2-2	PM10/2.5	7.20E-02	1.94E-02	0.30	1.32	---	7.20E-02	**0.30**	**1.32**
		AP-42 Table 3.2-2	SO2	2.18E-03	5.88E-04	0.01	0.04	---	2.18E-03	**0.01**	**0.04**
		AP-42 Table 3.2-2	*Acetaldehyde	1.04E-02	2.79E-03	0.04	0.19	50.0%	5.18E-03	**0.02**	**0.09**
		AP-42 Table 3.2-2	*Acrolein	9.76E-03	2.63E-03	0.04	0.18	50.0%	4.88E-03	**0.02**	**0.09**
		AP-42 Table 3.2-2	Benzene	5.86E-03	1.58E-03	0.02	0.11	50.0%	2.93E-03	**0.01**	**0.05**
		AP-42 Table 3.2-2	Butadiene, 1,3-	2.46E-03	6.63E-04	0.01	0.05	50.0%	1.23E-03	**5E-03**	**0.02**
		AP-42 Table 3.2-2	Ethylbenzene	9.20E-05	2.48E-05	4E-04	2E-03	50.0%	4.60E-05	**2E-04**	**8E-04**
		Vendor Data	*Formaldehyde	0.050	1.35E-02	0.21	0.92	76.0%	1.20E-02	**0.05**	**0.22**
		AP-42 Table 3.2-2	n-Hexane	---	---	---	---	---	---	---	---
		AP-42 Table 3.2-2	Methanol	1.14E-02	3.06E-03	0.05	0.21	50.0%	5.68E-03	**0.02**	**0.10**
		AP-42 Table 3.2-2	POM	8.83E-04	2.38E-04	4E-03	0.02	50.0%	4.42E-04	**2E-03**	**0.01**
		AP-42 Table 3.2-2	Toluene	2.07E-03	5.58E-04	0.01	0.04	50.0%	1.04E-03	**4E-03**	**0.02**
		AP-42 Table 3.2-2	TMP, 2,2,4-	---	---	---	---	---	---	---	---
		AP-42 Table 3.2-2	Xylenes	7.23E-04	1.95E-04	3E-03	0.01	50.0%	3.62E-04	**2E-03**	**0.01**
		AP-42 Table 3.2-2	Other/Trace HAP	6.65E-04	1.79E-04	3E-03	0.01	50.0%	3.32E-04	**1E-03**	**0.01**
		Sum	Total HAP	9.42E-02	2.54E-02	0.39	1.73	63.8%	0.03	**0.14**	**0.63**
		Vendor Data	CO2 (GWP=1)	465.00	125.34	1,948	8,531	---	465.00	**1,948**	**8,531**
		Vendor Data	CH4 (GWP=25)	0.24	2.30E-01	1.01	4.40	---	0.24	**1.01**	**4.40**
		40CFR98 Table C2	N2O (GWP=298)	8.18E-04	2.20E-04	3E-03	0.02	---	8.18E-04	**3E-03**	**0.02**
		Weighted Sum	CO2e	471.24	131.15	1,974	8,646	---	471.24	**1,974**	**8,646**

* = Aldehyde

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr (Each).
2 - As per vendor specifications, NMNEHC (non-methane/non-ethane hydrocarbons) do NOT include aldehydes. VOC is the sum of NMNEHC, Acetaldehyde, Acrolein, and Formaldehyde (HCHO).
3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
4 - "Other/Trace HAPs" includes: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloro-propene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).
5 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate. (It does NOT impact the emission estimates.)

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

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

[a]Owners and operators of stationary non-certified SI engines may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15 percent O2.
[b]Owners and operators of new or reconstructed non-emergency lean burn SI stationary engines with a site rating of greater than or equal to 250 brake HP located at a major source that are meeting the requirements of 40 CFR part 63, subpart ZZZZ, Table 2a do not have to comply with the CO emission standards of Table 1 of this subpart.
[c]The emission standards applicable to emergency engines between 25 HP and 130 HP are in terms of NO_x + HC.
[d]For purposes of this subpart, when calculating emissions of volatile organic compounds, emissions of formaldehyde should not be included.

Compressor Engine (CE-03, CE-05 and CE-06)

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr (ave)	tpy		g/bhp-hr	lb/hr (ave)	tpy
CE-03 CE-05 CE-06 (Each)	Compressor Engine 03, 05 and 06 (Each) (NSCR-03, NSCR-05 and NSCR-06) Waukesha L5794 GSI (4SRB) 1,380 bhp (Each) 8,760 hr/yr (Each) 1,200 rpm, 16 cyl 7,040 in3 Displacement 440 in3/cyl 1,149 Exhaust Temp (oF) 6,525 Exhaust Flow (acfm) Manufactured ≥ 07/01/10 NSPS JJJJ Affected 7,510 Btu/bhp-hr (HHV) 10.36 MMBtu/hr (HHV) (Each) 10,161 scf/hr (Each) 89.01 MMscf/yr (Each) 1,020 Btu/scf (HHV)	Vendor Data	NOX	13.90	4.08	42.29	185.23	96.5%	0.49	**1.48**	**6.48**
		Vendor Data	CO	8.80	2.58	26.77	117.27	93.3%	0.59	**1.81**	**7.92**
		Vendor Data	NMNEHC	0.30	0.09	0.91	4.00	84.5%	0.05	**0.14**	**0.62**
		Sum	VOC (w/Aldehyde)	0.37	0.11	1.12	4.91	84.5%	0.06	**0.17**	**0.76**
		AP-42 Table 3.2-2	PM10/2.5	6.61E-02	1.94E-02	0.20	0.88	---	0.07	**0.20**	**0.88**
		AP-42 Table 3.2-2	SO2	2.00E-03	5.88E-04	0.01	0.03	---	2E-03	**0.01**	**0.03**
		AP-42 Table 3.2-2	*Acetaldehyde	9.50E-03	2.79E-03	0.03	0.13	84.5%	1E-03	**4E-03**	**0.02**
		AP-42 Table 3.2-2	*Acrolein	8.96E-03	2.63E-03	0.03	0.12	84.5%	1E-03	**4E-03**	**0.02**
		AP-42 Table 3.2-2	Benzene	5.38E-03	1.58E-03	0.02	0.07	84.5%	8E-04	**3E-03**	**0.01**
		AP-42 Table 3.2-2	Butadiene, 1,3-	2.26E-03	6.63E-04	0.01	0.03	84.5%	4E-04	**1E-03**	**5E-03**
		AP-42 Table 3.2-2	Ethylbenzene	8.45E-05	2.48E-05	3E-04	1E-03	84.5%	1E-05	**4E-05**	**2E-04**
		Vendor Data	*Formaldehyde	5.00E-02	1.47E-02	0.15	0.67	84.5%	0.01	**0.02**	**0.10**
		AP-42 Table 3.2-2	n-Hexane	---	---	---	---	---	---	**---**	**---**
		AP-42 Table 3.2-2	Methanol	1.04E-02	3.06E-03	0.03	0.14	84.5%	2E-03	**5E-03**	**0.02**
		AP-42 Table 3.2-2	POM	8.11E-04	2.38E-04	2E-03	0.01	84.5%	1E-04	**4E-04**	**2E-03**
		AP-42 Table 3.2-2	Toluene	1.90E-03	5.58E-04	0.01	0.03	84.5%	3E-04	**9E-04**	**4E-03**
		AP-42 Table 3.2-2	TMP, 2,2,4-	---	---	---	---	84.5%	---	**---**	**---**
		AP-42 Table 3.2-2	Xylenes	6.64E-04	1.95E-04	2E-03	0.01	84.5%	1E-04	**3E-04**	**1E-03**
		AP-42 Table 3.2-2	Other/Trace HAP	6.10E-04	1.79E-04	2E-03	0.01	84.5%	9E-05	**3E-04**	**1E-03**
		Sum	Total HAP	9.06E-02	2.66E-02	0.28	1.21	84.5%	0.01	**0.04**	**0.19**
		Vendor Data	CO2 (GWP=1)	527.00	154.71	1,603	7,023	---	527.00	**1,603**	**7,023**
		AP-42 Table 3.2-2	CH4 (GWP=25)	7.83E-01	2.30E-01	2.38	10.44	---	0.78	**2.38**	**10.44**
		40CFR98 Table C2	N2O (GWP=298)	7.51E-04	2.20E-04	2E-03	0.01	---	8E-04	**2E-03**	**0.01**
		Weighted Sum	CO2e	546.81	160.52	1,664	7,287	---	546.81	**1,664**	**7,287**

* = Aldehyde

Notes:

1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr (Each).

2 - As per vendor specifications, NMNEHC (non-methane/non-ethane hydrocarbons) do NOT include aldehydes. VOC is the sum of NMNEHC, Acetaldehyde, Acrolein, and Formaldehyde (HCHO).

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

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

5 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate. (It does NOT impact the emission estimates.)

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

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

[a]Owners and operators of stationary non-certified SI engines may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15 percent O2.

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

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

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

!! Line 58 (20x96x70%) !!

Compressor Engine (CE-07, CE-08, and CE-12 thru CE-15)

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
CE-07 CE-08 CE-12 CE-13 CE-14 CE-15 (Each)	Compressor Engine 07, 08, and 12 thru 15 (OxCat-07, 08, and 12 thru 15) Caterpillar (CAT) G3516B (4SLB) 1,380 bhp (Each) 8,760 hr/yr (Each) 1,400 rpm, 16 cyl 4,230 in3 Displacement 264 in3/cyl 995 Exhaust Temp (oF) 9,156 Exhaust Flow (acfm) Manufactured ≥ 07/01/10 NSPS JJJJ Affected 8,226 Btu/bhp-hr (HHV) 11.35 MMBtu/hr (HHV) (Each) 11,129 scf/hr (Each) 97.49 MMscf/yr (Each) 1,020 Btu/scf (HHV)	Vendor Data	NOX	0.50	0.13	1.52	6.66	---	0.50	**1.52**	**6.66**
		Vendor Data	CO	2.71	0.73	8.24	36.11	81.5%	0.50	**1.52**	**6.66**
		Vendor Data	NMNEHC	0.48	0.13	1.46	6.40	45.8%	0.26	**0.79**	**3.46**
		Sum	VOC (w/Aldehyde)	0.96	0.26	2.92	12.80	59.3%	0.39	**1.19**	**5.20**
		AP-42 Table 3.2-2	PM10/2.5	3.73E-02	9.99E-03	0.11	0.50	---	0.04	**0.11**	**0.50**
		AP-42 Table 3.2-2	SO2	2.19E-03	5.88E-04	0.01	0.03	---	2E-03	**0.01**	**0.03**
		AP-42 Table 3.2-2	*Acetaldehyde	3.12E-02	8.36E-03	0.09	0.42	45.8%	0.02	**0.05**	**0.23**
		AP-42 Table 3.2-2	*Acrolein	1.92E-02	5.14E-03	0.06	0.26	45.8%	0.01	**0.03**	**0.14**
		AP-42 Table 3.2-2	Benzene	1.64E-03	4.40E-04	5E-03	0.02	45.8%	9E-04	**3E-03**	**0.01**
		AP-42 Table 3.2-2	Butadiene, 1,3-	9.96E-04	2.67E-04	3E-03	0.01	45.8%	5E-04	**2E-03**	**0.01**
		AP-42 Table 3.2-2	Ethylbenzene	1.48E-04	3.97E-05	5E-04	2E-03	45.8%	8E-05	**2E-04**	**1E-03**
		Vendor Data	*Formaldehyde	0.43	0.12	1.31	5.73	76.0%	0.10	**0.31**	**1.38**
		AP-42 Table 3.2-2	n-Hexane	4.14E-03	1.11E-03	0.01	0.06	45.8%	2E-03	**0.01**	**0.03**
		AP-42 Table 3.2-2	Methanol	9.33E-03	2.50E-03	0.03	0.12	45.8%	0.01	**0.02**	**0.07**
		AP-42 Table 3.2-2	POM	1.39E-03	3.74E-04	4E-03	0.02	45.8%	8E-04	**2E-03**	**0.01**
		AP-42 Table 3.2-2	Toluene	1.52E-03	4.08E-04	5E-03	0.02	45.8%	8E-04	**3E-03**	**0.01**
		AP-42 Table 3.2-2	TMP, 2,2,4-	9.33E-04	2.50E-04	3E-03	0.01	45.8%	5E-04	**2E-03**	**0.01**
		AP-42 Table 3.2-2	Xylenes	6.87E-04	1.84E-04	2E-03	0.01	45.8%	4E-04	**1E-03**	**5E-03**
		AP-42 Table 3.2-2	Other/Trace HAP	1.20E-03	3.21E-04	4E-03	0.02	45.8%	6E-04	**2E-03**	**0.01**
		Sum	Total HAP	0.50	0.13	1.53	6.69	71.7%	0.14	**0.43**	**1.90**
		Vendor Data	CO2 (GWP=1)	527.00	141.24	1,603	7,023	---	527.00	**1,603**	**7,023**
		AP-42 Table 3.2-2	CH4 (GWP=25)	4.66	1.25	14.19	62.15	---	4.66	**14.19**	**62.15**
		40CFR98 Table C2	N2O (GWP=298)	8.23E-04	2.20E-04	3E-03	0.01	---	8E-04	**3E-03**	**0.01**
		Weighted Sum	CO2e	644	173	1,959	8,580	---	643.85	**1,959**	**8,580**

* = Aldehyde

Notes:

1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr (Each).

2 - As per vendor specifications, NMNEHC (non-methane/non-ethane hydrocarbons) do NOT include aldehydes. VOC is the sum of NMNEHC, Acetaldehyde, Acrolein, and Formaldehyde (HCHO).

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

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

5 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate. (It does NOT impact the emission estimates.)

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

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

[a]Owners and operators of stationary non-certified SI engines may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15 percent O2.

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

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

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

Compressor Blowdown/Emergency Shutdown Testing (BD)

Source ID	Unit Description	Site Rating	Blowdown and ESD	Blowdown Gas	Total Gas Vented	Control %	VOC 8,200 lb/MMscf		CO2 300 lb/MMscf		CH4 39,800 lb/MMscf		CO2e CH4 GWP = 25	
		bhp	Events/yr	scf/bhp	MMscf/yr		lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
BD	Compressor 02	1,900	52	4.71	0.47	na	0.44	1.91	0.02	0.07	2.11	9.26	52.87	231.59
	Compressor 03	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 04	1,900	52	4.71	0.47		0.44	1.91	0.02	0.07	2.11	9.26	52.87	231.59
	Compressor 05	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 06	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 07	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 08	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 12	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 13	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 14	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 15	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Emergency Shutdown (ESD) Test	16,220	2	14.13	0.46		0.43	1.88	0.02	0.07	2.08	9.12	52.08	228.12
*lb/hr is tpy averaged over 8,760 hr/yr		**TOTAL:**	**574**	**TOTAL:**	**4.43**	**TOTAL:**	**4.15**	**18.17**	**TOTAL:**	**0.02**	**0.66**	**2.11**	**88.18**	**52.87**	**2,205**
						Pre-Controlled:	4.15	18.17		0.02	0.66	2.11	88.18	52.87	2,205

Source ID	Unit Description	Benzene 25.00 lb/MMscf		Ethylbenzene 25.00 lb/MMscf		n-Hexane 125.00 lb/MMscf		Methanol 100.00 lb/MMscf		Toluene 25.00 lb/MMscf		2,2,4-TMP 25.00 lb/MMscf		Xylene 25.00 lb/MMscf		Total HAP 350.00 lb/MMscf	
		lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
BD	Compressor 02	1E-03	6E-03	1E-03	6E-03	0.01	0.03	5E-03	0.02	1E-03	6E-03	1E-03	6E-03	1E-03	6E-03	0.02	0.08
	Compressor 03	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 04	1E-03	6E-03	1E-03	6E-03	0.01	0.03	5E-03	0.02	1E-03	6E-03	1E-03	6E-03	1E-03	6E-03	0.02	0.08
	Compressor 05	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 06	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 07	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 08	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 12	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 13	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 14	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 15	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Emergency Shutdown (ESD) Test	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
*lb/hr is tpy averaged over 8,760 hr/y	**TOTAL:**	**0.01**	**0.06**	**0.01**	**0.06**	**0.06**	**0.28**	**0.05**	**0.22**	**0.01**	**0.06**	**0.01**	**0.06**	**0.01**	**0.06**	**0.18**	**0.78**
	Pre-Controlled:	0.01	0.06	0.01	0.06	0.06	0.28	0.05	0.22	0.01	0.06	0.01	0.06	0.01	0.06	0.18	0.78

Notes: 1 - The results of a representative **Inlet ("Wet") Gas Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency:	15%	
Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
CO2	195 lb/MMscf	**300 lb/MMscf**	0.58	0.04
Methane (CH4)	34,560 lb/MMscf	**39,800 lb/MMscf**	76.54	4.85
N2/Water/Ethane/Etc	10,155 lb/MMscf	**3,700 lb/MMscf**	7.12	0.45
VOC	7,049 lb/MMscf	**8,200 lb/MMscf**	15.77	1.00
TOTAL Gas	51,959 lb/MMscf	**52,000 lb/MMscf**	100.00	---

Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
Benzene	2.06 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Ethylbenzene	0.28 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
n-Hexane	104.58 lb/MMscf	**125.00 lb/MMscf**	0.24	1.52
Methanol	84.35 lb/MMscf	**100.00 lb/MMscf**	0.19	1.22
Toluene	2.43 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
2,2,4-TMP	2.41 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Xylenes	6.99 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Total HAP	203.09 lb/MMscf	**350.00 lb/MMscf**	0.67	4.27

2 - scf/bhp based on "Maximum Volume" of 6,500 scf per 1,380 bhp engine blowdown.
(6,500 scf / 1,380 bhp = 4.71 scf/bhp - Reference prior application.)

Compressor Rod Packing (CRP)

Source ID	Unit Description (Compressor Rod Packing)	No of Cylinders	scfh per Cylinder	Contin-gency	Total Fugitive Leak Rate		Control Efficiency	VOC 8,200 lb/MMscf	
					scfh	MMscfy		lb/hr (ave)	tpy
CRP	Compressor 02	4	12.0	15%	55.20	0.48	na	0.45	1.98
	Compressor 03	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 04	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 05	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 06	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 07	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 08	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 12	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 13	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 14	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 15	4	12.0	15%	55.20	0.48		0.45	1.98
*lb/hr is tpy averaged over 8,760 hr/yr							**TOTAL:**	**4.98**	**21.81**
								4.98	21.81

Source ID	Unit Description (Compressor Rod Packing)	CO2 300.00 lb/MMscf		CH4 39,800.00 lb/MMscf		CO2e CH4 GWP = 25	
		lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
CRP	Compressor 02	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 03	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 04	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 05	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 06	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 07	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 08	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 12	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 13	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 14	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 15	0.02	0.07	2.20	9.62	54.94	240.64
TOTAL:		**0.18**	**0.80**	**24.17**	**105.85**	**604.35**	**2,647**
		0.18	0.80	24.17	105.85	604.35	2,647

Source ID	Unit Description (Compressor Rod Packing)	Benzene 25.00 lb/MMscf		E-Benzene 25.00 lb/MMscf		n-Hexane 125.00 lb/MMscf		Methanol 100.00 lb/MMscf		Toluene 25.00 lb/MMscf		2,2,4-TMP 25.00 lb/MMscf		Xylene 25.00 lb/MMscf		Tot HAP 350.00 lb/MMscf	
		lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
CRP	Compressor 02	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 03	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 04	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 05	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 06	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 07	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 08	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 12	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 13	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 14	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 15	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	TOTAL:	**0.02**	**0.07**	**0.02**	**0.07**	**0.08**	**0.33**	**0.06**	**0.27**	**0.02**	**0.07**	**0.02**	**0.07**	**0.02**	**0.07**	**0.21**	**0.93**
		0.02	0.07	0.02	0.07	0.08	0.33	0.06	0.27	0.02	0.07	0.02	0.07	0.02	0.07	0.21	0.93

Notes:

1 - Compressor Rod Packing (CRP) is a significant source of emissions; however, these emissions have not been included in previous applications.

2 - As per the manufacturer (Ariel): "Packing in new and broken-in condition will leak 5-10 scfh through the vent. This leakage rate will increase over time due to wear of the non-metallic sealing rings."
The Williams' engineering department provides a conservative leak rate of 12 scfh/cylinder (equal to 48 scfh/compressor). An additional 15% contingency has been added.

3 - The results of a representative **Inlet ("Wet") Gas Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency: 15%		
Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
CO2	194.76 lb/MMscf	**300.00 lb/MMscf**	0.58	---
Methane (CH4)	34,560 lb/MMscf	**39,800 lb/MMscf**	76.54	---
N2/Water/Ethane/Etc	10,155 lb/MMscf	**3,700 lb/MMscf**	7.12	---
VOC	7,049 lb/MMscf	**8,200 lb/MMscf**	15.77	100.00
TOTAL Gas	51,959 lb/MMscf	**52,000 lb/MMscf**	100.00	100.00

Pollutant	Wet Gas	Worst Case	%Total	%VOC
Benzene	2.06 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Ethylbenzene	0.28 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
n-Hexane	104.58 lb/MMscf	**125.00 lb/MMscf**	0.24	1.52
Methanol	84.35 lb/MMscf	**100.00 lb/MMscf**	0.19	1.22
Toluene	2.43 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
2,2,4-TMP	2.41 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Xylenes	6.99 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Total HAP	203.09 lb/MMscf	**350.00 lb/MMscf**	0.67	4.27

Engine Start-up (ESU)

Source ID	Unit ID	Unit Description (Engine Start-Up	BHP Rating	Events/yr	scf/Event	Total Gas Vented	VOC 8,200 lb/MMscf		CO2 300 lb/MMscf-Leg		CH4 39,800 lb/MMscf-Leg		CO2e CH4 GWP = 25	
						MMscf/yr	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
ESU	CE-02	Compressor Engine 02	1,900	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-03	Compressor Engine 03	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-04	Compressor Engine 04	1,900	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-05	Compressor Engine 05	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-06	Compressor Engine 06	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-07	Compressor Engine 07	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-08	Compressor Engine 08	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-12	Compressor Engine 12	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-13	Compressor Engine 13	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-14	Compressor Engine 14	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-15	Compressor Engine 15	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
			TOTAL:	**2,288**		**TOTAL:**	**1.50**	**6.57**	**0.05**	**0.24**	**7.28**	**31.87**	**181.97**	**797.04**
						Pre-Control:	1.50	6.57	0.05	0.24	7.28	31.87	181.97	797.04
						PA PTE:		0.52		0.60		27.70		693.10

* lb/hr is averaged over 8,760 hr/yr

Source ID	Unit ID	Benzene 25 lb/MMscf		Ethylbenzene 25 lb/MMscf		n-Hexane 125 lb/MMscf		Methanol 100 lb/MMscf		Toluene 25 lb/MMscf		2,2,4-TMP 25 lb/MMscf		Xylene 25 lb/MMscf		Total HAP 350 lb/MMscf	
		lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
ESU	CE-02	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-03	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-04	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-05	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-06	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-07	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-08	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-12	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-13	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-14	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-15	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
		5E-03	**0.02**	**5E-03**	**0.02**	**0.02**	**0.10**	**0.02**	**0.08**	**5E-03**	**0.02**	**5E-03**	**0.02**	**5E-03**	**0.02**	**0.06**	**0.28**
	Pre-Control:	5E-03	2E-02	5E-03	2E-02	2E-02	0.10	0.02	0.08	5E-03	2E-02	5E-03	2E-02	5E-03	2E-02	6E-02	0.28
	PA PTE:	3E-03		3E-03		0.05	---			3E-03		0.03		3E-03			0.09

Notes:
1 - Emissions are from unburned fuel during "Cold-Start". Volume as per Engineering Department.
2 - The results of a representative Inlet ("Wet") Gas Analysis were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency:	15%	
Pollutant	**Inlet Gas**	**Worst Case**	**Wgt% Total**	**Wgt% VOC**
CO2	194.76 lb/MMscf	**300.00 lb/MMscf**	0.58%	3.66%
Methane (CH4)	34,560.16 lb/MMscf	**39,800 lb/MMscf**	76.54%	485.37%
N2/Water/Ethane/Etc	10,154.85 lb/MMscf	**3,700 lb/MMscf**	7.12%	45.12%
VOC	7,048.95 lb/MMscf	**8,200 lb/MMscf**	15.77%	100.00%
TOTAL Gas	51,958.72 lb/MMscf	**52,000 lb/MMscf**	100.00%	---

Pollutant	Inlet Gas	Worst Case	Wgt% Total	Wgt% VOC
Benzene	2.06 lb/MMscf	**25.00 lb/MMscf**	0.05%	0.30%
Ethylbenzene	0.28 lb/MMscf	**25.00 lb/MMscf**	0.05%	0.30%
n-Hexane	104.58 lb/MMscf	**125.00 lb/MMscf**	0.24%	1.52%
Methanol	84.35 lb/MMscf	**100.00 lb/MMscf**	0.19%	1.22%
Toluene	2.43 lb/MMscf	**25.00 lb/MMscf**	0.05%	0.30%
2,2,4-TMP	2.41 lb/MMscf	**25.00 lb/MMscf**	0.05%	0.30%
Xylenes	6.99 lb/MMscf	**25.00 lb/MMscf**	0.05%	0.30%
Total HAP	203.09 lb/MMscf	**350.00 lb/MMscf**	0.67%	4.27%

Appalachia Midstream Services, LLC

Miller Compressor Station

Application for 45CSR30 Title V Operating Permit

Engine Crankcase (ECC)

Source ID	Site Rating	Operations	G3516B Leak Rate 0.36 scf/bhp-hr MMscf/yr	NOx 1.52 lb/hr		CO 8.24 lb/hr		VOC 2.92 lb/hr		PM 0.11 lb/hr		SO2 0.01 lb/hr	
				7.63 lb/MMscf		41.37 lb/MMscf		14.66 lb/MMscf		0.57 lb/MMscf		0.03 lb/MMscf	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-02	1,900 bhp	8,760 hr/yr	6.04	0.01	0.02	0.03	0.12	0.01	0.04	4E-04	2E-03	2E-05	1E-04
CE-03	1,380 bhp	8,760 hr/yr	4.39	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-04	1,900 bhp	8,760 hr/yr	6.04	5E-03	0.02	0.03	0.12	0.01	0.04	4E-04	2E-03	2E-05	1E-04
CE-05	1,380 bhp	8,760 hr/yr	4.39	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-06	1,380 bhp	8,760 hr/yr	4.39	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-07	1,380 bhp	8,760 hr/yr	4.39	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-08	1,380 bhp	8,760 hr/yr	4.39	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-12	1,380 bhp	8,760 hr/yr	4.39	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-13	1,380 bhp	8,760 hr/yr	4.39	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-14	1,380 bhp	8,760 hr/yr	4.39	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-15	1,380 bhp	8,760 hr/yr	4.39	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
TOT:	**16,220 bhp**	**87,600 hr/yr**	**51.54**	**0.04**	**0.20**	**0.24**	**1.07**	**0.09**	**0.38**	**3E-03**	**0.01**	**2E-04**	**9E-04**
Total:				**0.04**	**0.20**	**0.24**	**1.07**	**0.09**	**0.38**	**3E-03**	**0.01**	**2E-04**	**9E-04**
Pre-Control:				0.04	0.20	0.24	1.07	0.09	0.38	3E-03	0.01	2E-04	9E-04

Source ID	CO2 1,603 lb/hr		CH4 14.19 lb/hr		N2O 2.50E-03 lb/hr		CO2e 1,959 lb/hr	
	8,046 lb/MMscf		71.21 lb/MMscf		1.26E-02 lb/MMscf		9,830 lb/MMscf	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-02	5.55	24.29	0.05	0.21	9E-06	4E-05	6.77	29.67
CE-03	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-04	5.55	24.29	0.05	0.21	9E-06	4E-05	6.77	29.67
CE-05	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-06	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-07	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-08	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-12	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-13	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-14	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-15	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
Total:	**47.34**	**207.34**	**0.42**	**1.84**	**7E-05**	**3E-04**	**57.83**	**253.32**
Pre-Control:	47.34	207.34	0.42	1.84	7E-05	3E-04	57.83	253.32

Source ID	Acetaldehyde 9.49E-02 lb/hr		Acrolein 5.83E-02 lb/hr		Benzene 4.99E-03 lb/hr		Butadiene 3.03E-03 lb/hr		Ethylbenzene 4.51E-04 lb/hr		HCHO 1.31E+00 lb/hr		n-Hexane 1.26E-02 lb/hr		Methanol 2.84E-02 lb/hr		POM 4.24E-03 lb/hr		Toluene 4.63E-03 lb/hr		TMP, 2,2,4- 2.84E-03 lb/hr		Xylenes 2.09E-03 lb/hr		Other/Trace 3.64E-03 lb/hr		Total HAPs 1.53 lb/hr	
	4.76E-01 lb/MMscf		2.93E-01 lb/MMscf		2.51E-02 lb/MMscf		1.52E-02 lb/MMscf		2.26E-03 lb/MMscf		6.56E+00 lb/MMscf		6.32E-02 lb/MMscf		1.42E-01 lb/MMscf		2.13E-02 lb/MMscf		2.32E-02 lb/MMscf		1.42E-02 lb/MMscf		1.05E-02 lb/MMscf		1.83E-02 lb/MMscf		7.67 lb/MMscf	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-02	3E-04	1E-03	2E-04	9E-04	2E-05	8E-05	1E-05	5E-05	2E-06	7E-06	5E-03	0.02	4E-05	2E-04	1E-04	4E-04	1E-05	6E-05	2E-05	7E-05	1E-05	4E-05	7E-06	3E-05	1E-05	6E-05	5E-03	0.02
CE-03	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-04	3E-04	1E-03	2E-04	9E-04	2E-05	8E-05	1E-05	5E-05	2E-06	7E-06	5E-03	0.02	4E-05	2E-04	1E-04	4E-04	1E-05	6E-05	2E-05	7E-05	1E-05	4E-05	7E-06	3E-05	1E-05	6E-05	5E-03	0.02
CE-05	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-06	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-07	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-08	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-12	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-13	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-14	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-15	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
Total:	**3E-03**	**0.01**	**2E-03**	**0.01**	**1E-04**	**6E-04**	**9E-05**	**4E-04**	**1E-05**	**6E-05**	**0.04**	**0.17**	**4E-04**	**2E-03**	**8E-04**	**4E-03**	**1E-04**	**5E-04**	**1E-04**	**6E-04**	**8E-05**	**4E-04**	**6E-05**	**3E-04**	**1E-04**	**5E-04**	**0.05**	**0.20**
Pre-Cont:	3E-03	0.01	2E-03	0.01	1E-04	6E-04	9E-05	4E-04	1E-05	6E-05	0.04	0.17	4E-04	2E-03	8E-04	4E-03	1E-04	5E-04	1E-04	6E-04	8E-05	4E-04	6E-05	3E-04	1E-04	5E-04	0.05	0.20

Notes: 1 - As per Caterpillar's Application & Installation Guide - Crankcase Ventilation Systems:
"[B]ow-by on a new engine is approx. 0.5 ft3 /bhp-hr
and design for a worn engine should be 1.0 ft3 /bhp-hr."
http://s7d2.scene7.com/is/content/Caterpillar/CM20160713-53120-62603

2 - Blowby emission rates converted from "actual" cubic feet to "standard" cubic feet:

scf = acf * [(P+14.6959)/14.6959] * [527.67/(T+459.67)]

Actual to Standard Conversions (@ 995 oF vs. 68 oF (Ignore Δ psi):	1.0 acf =	0.36 scf

3 - Engine Exhaust Flow Rates converted from "actual" cubic feet per minute to "standard" cubic feet per minute: (scf = acf * [(P+14.6959)/14.6959] * [527.67/(T+459.67)])

Actual to Standard Conversions (@ 995 oF vs. 68 oF (Ignore Δ psi):	9,156 acfm =	3,321 scfm

Microturbine Generator (GEN-01)

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
		Vendor Data x 2	NOX	0.27	0.04	0.48	2.10	---	**0.27**	**0.48**	**2.10**
	Non-Emergency Microturbine Generator	Vendor Data x 2	CO	0.74	0.10	1.32	5.78	---	**0.74**	**1.32**	**5.78**
		Vendor Data x 2	NMNEHC	6.76E-02	0.01	0.12	0.53	---	**0.07**	**0.12**	**0.53**
		SUM	VOC (w/HCHO)	7.93E-02	0.01	0.14	0.61	---	**0.08**	**0.14**	**0.61**
		AP-42 Table 3.1-2a x 2	PM10/2.5	1.02E-01	1.33E-02	0.18	0.79	---	**0.10**	**0.18**	**0.79**
	Capstone C600	AP-42 Table 3.1-2a x 2	SO2	9.07E-03	1.18E-03	0.02	0.07	---	**0.01**	**0.02**	**0.07**
		AP-42 Table 3.1-3 x 2	Acetaldehyde*	6.17E-04	8.00E-05	1E-03	5E-03	---	**6E-04**	**1E-03**	**5E-03**
	805 bhp	AP-42 Table 3.1-3 x 2	Acrolein*	9.87E-05	1.28E-05	2E-04	8E-04	---	**1E-04**	**2E-04**	**8E-04**
	8,760 hr/yr	AP-42 Table 3.1-3 x 2	Benzene	1.85E-04	2.40E-05	3E-04	1E-03	---	**2E-04**	**3E-04**	**1E-03**
		AP-42 Table 3.1-3 x 2	Butadiene, 1,3-	6.63E-06	8.60E-07	1E-05	5E-05	---	**7E-06**	**1E-05**	**5E-05**
		AP-42 Table 3.1-3 x 2	Ethylbenzene	4.93E-04	6.40E-05	9E-04	4E-03	---	**5E-04**	**9E-04**	**4E-03**
		AP-42 Table 3.1-3 x 2	Formaldehyde*	1.09E-02	1.42E-03	2E-02	9E-02	---	**0.01**	**0.02**	**0.09**
GEN-01	535 Exhaust Temp (oF)	AP-42 Table 3.1-3 x 2	n-Hexane	---	---	---	---	---	**---**	**---**	**---**
		AP-42 Table 3.1-3 x 2	Methanol	---	---	---	---	---	**---**	**---**	**---**
		AP-42 Table 3.1-3 x 2	POM	5.35E-04	6.94E-05	9E-04	4E-03	---	**5E-04**	**9E-04**	**4E-03**
		AP-42 Table 3.1-3 x 2	Toluene	2.00E-03	2.60E-04	4E-03	0.02	---	**2E-03**	**4E-03**	**0.02**
		AP-42 Table 3.1-3 x 2	TMP, 2,2,4-	---	---	---	---	---	**---**	**---**	**---**
	8,497 Btu/bhp-hr (HHV)	AP-42 Table 3.1-3 x 2	Xylenes	9.87E-04	1.28E-04	2E-03	8E-03	---	**1E-03**	**2E-03**	**8E-03**
	16,994 Btu/bhp-hr (HHV) x 2	AP-42 Table 3.1-3 x 2	Other/Trace HAP	4.47E-04	5.80E-05	8E-04	3E-03	---	**4E-04**	**8E-04**	**3E-03**
	13.68 MMBtu/hr (HHV)	Sum	Total HAP	1.63E-02	2.12E-03	0.03	0.13	---	**0.02**	**0.03**	**0.13**
	13,412 scf/hr	AP-42 Table 3.1-3 x 2	CO2 (GWP=1)	1,695.84	220.00	3,010	13,182	---	**1,696**	**3,010**	**13,182**
	117.49 MMscf/yr	AP-42 Table 3.1-3 x 2	CH4 (GWP=25)	1.33E-01	1.73E-02	0.24	1.04	---	**0.13**	**0.24**	**1.04**
	1,020 Btu/scf (HHV)	AP-42 Table 3.1-3 x 2	N2O (GWP=298)	4.63E-02	6.00E-03	0.08	0.36	---	**0.05**	**0.08**	**0.36**
		Weighted Sum	CO2e	1712.95	222.22	3,040	13,315	---	**1,713**	**3,040**	**13,315**

* = Aldehyde

Notes:
1 - The emissions estimates are based on operation at 100% of rated load for 8,760 hr/yr. Actual load and operating hours will be less.

2 - A footnote to AP-42 Table 3.4-1 indicates that "THC is based on EPA Test Method 25A" and "VOC = THC - Methane".
However, EPA Method 25A does NOT measure aldehydes (or methanol).
Accordingly, and to be conservative, total VOC is estimated by NMNEHC + aldehydes.

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

4 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.

5 - The turbine's operating load has a considerable effect on the resulting emission levels.
With reduced loads (lower than 80 percent) the NOX, CO, and THC (NMNEHC, VOC, HAP, and CH4) emissions are expected to be higher.
The vendor states that "fuel flows can be up to two times higher than steady state values."
Accordingly, and to be conservative, the vendor and AP-42 [full load, steady-state] emission factor data are increased by a factor of two (2).
(The Capstone C600 is comprised of three (3) 200 kWhe turbine generators operating in parallel, thus mininizing the low-load operations.)

Dehydrators 01-03 (Flash Tanks (DFT) and Still Vents (DSV))

Unit ID	Description	Capacity	Reference	Pollutant	GRI-GLYCalc Pre-Control Emissions		Worst-Case Pre-Control VOC/GHG: 15% Margin HAP: 15% Margin		Control Efficiency	Controlled Emissions	
					lb/hr	tpy	lb/hr	tpy	%	lb/hr	tpy
DFT-1 DFT-2 DFT-3 (Each)	Dehydrator Flash Tank Flash Tank Off-Gas Controlled by 98% Flare (FLR)	Flow Rate 55.0 MMscfd 8,760 hr/yr	GRI-GLYCalc 4.0	VOC	13.09	56.43	15.06	64.89	98.0%	**0.32**	**1.33**
			GRI-GLYCalc 4.0	Benzene	4E-03	0.02	5E-03	0.02		**1E-04**	**4E-04**
			GRI-GLYCalc 4.0	Ethylbenzene	3E-04	1E-03	3E-04	2E-03		**7E-06**	**3E-05**
			GRI-GLYCalc 4.0	n-Hexane	0.16	0.71	0.19	0.82		**4E-03**	**0.02**
			Process Simulation	Methanol	0.42	0.91	0.42	0.91		**0.02**	**0.05**
			GRI-GLYCalc 4.0	Toluene	4E-03	0.02	4E-03	0.02		**9E-05**	**4E-04**
			GRI-GLYCalc 4.0	2,2,4-TMP	2E-03	0.01	3E-03	0.01		**7E-06**	**3E-05**
			GRI-GLYCalc 4.0	Xylenes	0.01	0.02	0.01	0.03		**1E-04**	**6E-04**
			GRI-GLYCalc 4.0	Tot HAP	0.59	2.60	0.62	1.81		**0.03**	**0.07**
			GRI-GLYCalc 4.0	CO2	0.92	4.03	1.06	4.63	---	**1.06**	**4.63**
			GRI-GLYCalc 4.0	CH4	22.67	99.28	26.07	114.18	98.0%	**0.52**	**2.28**
			40CFR98 - Table A-1	CO2e	567.60	2,486	653	2,859	97.8%	**14.09**	**61.72**
DSV-1 DSV-2 DSV-3 (Each)	Dehydrator Still Vent Still Vent Off-Gas Controlled by Condenser/95% Reboiler	Flow Rate 55.0 MMscfd 8,760 hr/yr	GRI-GLYCalc 4.0	VOC	31.42	131.79	36.13	151.56	95.7%	**1.54**	**6.42**
			GRI-GLYCalc 4.0	Benzene	0.89	3.89	1.02	4.48	95.4%	**0.05**	**0.21**
			GRI-GLYCalc 4.0	Ethylbenzene	0.19	0.83	0.22	0.95	96.6%	**0.01**	**0.03**
			GRI-GLYCalc 4.0	n-Hexane	0.91	3.98	1.04	4.57	95.2%	**0.05**	**0.22**
			Process Simulation	Methanol	2.66	5.82	2.66	5.82	94.3%	**0.15**	**0.33**
			GRI-GLYCalc 4.0	Toluene	1.39	6.11	1.60	7.02	95.9%	**0.07**	**0.29**
			GRI-GLYCalc 4.0	2,2,4-TMP	0.01	0.06	0.02	0.07	95.3%	**8E-04**	**3E-03**
			GRI-GLYCalc 4.0	Xylenes	6.12	26.81	7.04	30.84	96.9%	**0.22**	**0.97**
			GRI-GLYCalc 4.0	Tot HAP	12.17	53.31	13.60	53.75	96.0%	**0.55**	**2.05**
			GRI-GLYCalc 4.0	CO2	1.06	4.64	1.22	5.34	---	**1.22**	**5.34**
			GRI-GLYCalc 4.0	CH4	1.52	6.66	1.75	7.66	95.0%	**0.09**	**0.38**
			40CFR98 - Table A-1	CO2e	38.01	171.14	44.93	196.81	92.4%	**3.40**	**14.91**
DHY-1 DHY-2 DHY-3 (Each)	Dehydrator (Total)	Flow Rate 55.0 MMscfd 8,760 hr/yr	GRI-GLYCalc 4.0	VOC	44.51	188.22	51.18	216.45	96.4%	**1.86**	**7.75**
			GRI-GLYCalc 4.0	Benzene	0.89	3.91	1.03	4.50	95.4%	**0.05**	**0.21**
			GRI-GLYCalc 4.0	Ethylbenzene	0.19	0.83	0.22	0.95	96.6%	**0.01**	**0.03**
			GRI-GLYCalc 4.0	n-Hexane	1.07	4.68	1.23	5.39	95.6%	**0.05**	**0.24**
			Process Simulation	Methanol	3.07	6.73	3.07	6.73	94.3%	**0.18**	**0.39**
			GRI-GLYCalc 4.0	Toluene	1.40	6.12	1.61	7.04	95.9%	**0.07**	**0.29**
			GRI-GLYCalc 4.0	2,2,4-TMP	0.02	0.08	0.02	0.09	95.9%	**8E-04**	**3E-03**
			GRI-GLYCalc 4.0	Xylenes	6.13	26.84	7.05	30.86	96.9%	**0.22**	**0.97**
			GRI-GLYCalc 4.0	Tot HAP	12.77	55.91	14.22	55.56	96.0%	**0.57**	**2.12**
			GRI-GLYCalc 4.0	CO2	1.98	8.67	2.28	9.97	---	**2.28**	**9.97**
			GRI-GLYCalc 4.0	CH4	24.19	105.94	27.82	121.83	97.8%	**0.61**	**2.67**
			40CFR98 - Table A-1	CO2e	605.62	2,657	698	3,056	97.5%	**17.50**	**76.63**

Notes: 1 - Used GRI-GLYCalc V4.0 to calculate Flash Tank and Regenerator/Still Vent emissions. Process Simulation used to calculate MeOH emissions. Total VOC includes MeOH.

2 - GRI-GLYCalc 4.0 Model Results are based on the following input:

Inlet Gas:	80 oF and 1,000 psig, H2O Saturated	Primary Glycol Pump:	Electric/Pneumatic - 15 gpm
Inlet Gas Analysis:	See Supplement S1 - Inlet Gas Summary	Backup Glycol Pump:	Kimray Gas-Assist - 7.5 gpm
Dry Gas:	55 MMscfd, 7.0 lb-H2O/MMscf	Flash Tank:	80 oF, 60 psig, 98% Combustion
Lean Glycol:	1.5 wt% H2O	Stripping Gas:	None
		Regen Control:	Condenser/95% Combustion

3 - A contingency has been added to the GRI-GLYCalc model results to account for potential future changes in gas composition.

Dehydrators 01-03 (DHY-1 thru DHY-3)

Source ID	Description	Reference	Pollutant	Worst-Case PRE-Control Emissions			Control Efficiency	Worst-Case Controlled Emissions		
				lb/hr (max)	lb/hr (ave)	tpy	%	lb/hr (max)	lb/hr (ave)	tpy
DHY-1 DHY-2 DHY-3 (Each)	Dehydrator 01 thru 03 (Each) (No Combustion Emissions Shown) 55.0 MMscfd (Each) 8,760 hr/yr (Each) 4,380 hr/yr (MeOH) Worst-case operating scenario: * Assume all flash tank off-gas is routed to the flare with 98% destruction efficiency. * Assume all still vent non-condensables are routed to the reboiler for use as fuel (95% control). 481,800 MMscf/yr (Each) 2.3 MMscf/hr (Each) NESHAP HH - Exempt (Less than 1.0 tpy Benzene)	See RBL-01 thru RBL-03 and FLR	NOX	See RBL-01 thru RBL-03 and FLR						
		See RBL-01 thru RBL-03 and FLR	CO	See RBL-01 thru RBL-03 and FLR						
		GRI-GLYCalc 4.0	NMNEHC	49.19	47.65	208.72	96.47%	**1.77**	**1.68**	**7.36**
		GRI-GLYCalc 4.0	VOC	50.95	49.42	216.45	96.42%	**1.86**	**1.77**	**7.75**
		See RBL-01 thru RBL-03 and FLR	SO2	See RBL-01 thru RBL-03 and FLR						
		See RBL-01 thru RBL-03 and FLR	PM10/2.5	See RBL-01 thru RBL-03 and FLR						
		See RBL-01 thru RBL-03 and FLR	Acetaldehyde	See RBL-01 thru RBL-03 and FLR						
		See RBL-01 thru RBL-03 and FLR	Acrolein	See RBL-01 thru RBL-03 and FLR						
		GRI-GLYCalc 4.0	Benzene	1.03	1.03	4.50	95.40%	**0.05**	**0.05**	**0.21**
		See RBL-01 thru RBL-03 and FLR	Butadiene, 1,3-	See RBL-01 thru RBL-03 and FLR						
		GRI-GLYCalc 4.0	Ethylbenzene	0.22	0.22	0.95	96.60%	**0.01**	**0.01**	**0.03**
		See RBL-01 thru RBL-03 and FLR	Formaldehyde	See RBL-01 thru RBL-03 and FLR						
		GRI-GLYCalc 4.0	n-Hexane	1.23	1.23	5.39	95.63%	**0.05**	**0.05**	**0.24**
		See RBL-01 thru RBL-03 and FLR	Methanol	3.07	1.54	6.73	94.25%	**0.18**	**0.09**	**0.39**
		See RBL-01 thru RBL-03 and FLR	POM	See RBL-01 thru RBL-03 and FLR						
		GRI-GLYCalc 4.0	Toluene	1.61	1.61	7.04	95.91%	**0.07**	**0.07**	**0.29**
		GRI-GLYCalc 4.0	TMP, 2,2,4-	0.02	0.02	0.09	95.88%	**2E-03**	**8E-04**	**4E-03**
		GRI-GLYCalc 4.0	Xylenes	7.05	7.05	30.86	96.85%	**0.44**	**0.22**	**0.97**
		See RBL-01 thru RBL-03 and FLR	Other/Trace HAP	See RBL-01 thru RBL-03 and FLR						
		Sum	Total HAP	14.22	12.68	55.55	96.18%	**0.80**	**0.49**	**2.12**
		GRI-GLYCalc 4.0	CO2 (GWP=1)	1.98	1.98	8.67	---	**2.28**	**2.28**	**9.97**
		GRI-GLYCalc 4.0	CH4 (GWP=25)	27.82	27.82	121.83	97.81%	**0.61**	**0.61**	**2.67**
		GRI-GLYCalc 4.0	N2O (GWP=298)	See RBL-01 thru RBL-03 and FLR						
		Weighted Sum	CO2e	697.38	697.38	3,055	97.49%	**17.50**	**17.50**	**76.63**

Notes: 1 - Results of GRI-GLYCalc Model are shown below:

55.0 MMscfd DHY-1 thru DHY-3	GRI-GLYCalc Pre-Controlled		GRI-GLYCalc Controlled	
	Results	w/ 15% Margin	Results	w/ 15% Margin
VOC (w/o MeOH)	181.50 tpy	208.72 tpy	6.40 tpy	7.36 tpy
VOC (w/ MeOH)	188.22 tpy	216.45 tpy	6.74 tpy	7.75 tpy
Benzene	3.91 tpy	4.50 tpy	0.18 tpy	0.21 tpy
Ethylbenzene	0.83 tpy	0.95 tpy	0.03 tpy	0.03 tpy
n-Hexane	4.68 tpy	5.39 tpy	0.20 tpy	0.24 tpy
Methanol (See Note 3)	6.73 tpy	6.73 tpy	0.34 tpy	0.39 tpy
Toluene	6.12 tpy	7.04 tpy	0.25 tpy	0.29 tpy
2,2,4-TMP	0.08 tpy	0.09 tpy	0.00 tpy	0.00 tpy
Xylenes	26.84 tpy	30.86 tpy	0.85 tpy	0.97 tpy
Total HAP	49.19 tpy	55.55 tpy	1.85 tpy	2.12 tpy
Carbon Dioxide (CO2)	8.67 tpy	8.67 tpy	8.67 tpy	9.97 tpy
Methane (CH4)	105.94 tpy	121.83 tpy	2.32 tpy	2.67 tpy
Carbon Dioxide Equivalent (C	2,657 tpy	3,055 tpy	66.64 tpy	76.63 tpy

*Dehydrator Operating Parameters (See Attachment C4 - Emission Program Results)			
Manufacturer:	na	Dry Gas Flow Rate:	55.0 MMscfd
Wet Gas:	80.00 oF	Gas Analysis:	08/09/18
Wet Gas:	1,000 psig	Primary Pump:	Electric
Wet Gas:	Saturated	Backup Pump:	Kimray 45020PV
Wet Gas:	32 lb-H2O/MMscf	Glycol Circ Rate:	15.00 gpm
Dry Gas:	7.00 lb H2O/MMscf	Glycol Circ Ratio:	12.62 gal/lb-H2O
Lean Glycol:	1.50 wt% H2O	Rich Glycol:	2.30 wt% H2O
Flash Temp:	80 oF	Regen Overhead:	1,760 scfh
Flash Press:	60 psig	Regen Control:	Cond/Comb
Flash Off-Gas:	846 scfh	Condenser Temp:	150 oF
Flash Recycle:	na	Condenser Press:	14.80 psia
Flash Control:	98%	Cond. Recycle:	95%
Stripping Gas:	na	Ambient Temp:	80 oF
Stripping Gas:	na	Condenser Vent:	326 scfh

2 - Used ProMax Process Simulation to conservatively estimate Methanol (MeOH) emissions as follows:

MeOH	Pre-Control			95% Control	
Each DHY:	3.1 lb/hr (max)	1.54 lb/hr (ave)	6.73 tpy	0.08 lb/hr (ave)	0.34 tpy
Total 3 DHYs:	9.2 lb/hr (max)	4.61 lb/hr (ave)	20.18 tpy	0.23 lb/hr (ave)	1.01 tpy

(Max MeOH injection occurs for less than 6 mo/yr.)

Reboiler (RBL-01 thru RBL-03)

Source ID	Description	Reference	Pollutant	Emission Factor		Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy
RBL-01 RBL-02 RBL-03 (Each)	Reboiler 01 thru 03 (Each) 1.0 MMBtu/hr (HHV) (Each) 2,165 Btu/scf (HHV) 8,760 hr/yr (Each) 462 scf/hr (Each) 4.05 MMscf/yr (Each)	EPA AP-42 Table 1.4-1	NOX	212.22	9.80E-02	**0.10**	**0.43**
		EPA AP-42 Table 1.4-1	CO	178.26	8.24E-02	**0.08**	**0.36**
		EPA AP-42 Table 1.4-2	NMNEHC	11.51	5.32E-03	**0.01**	**0.02**
		EPA AP-42 Table 1.4-2	VOC	11.67	5.39E-03	**0.01**	**0.02**
		EPA AP-42 Table 1.4-2	PM10/2.5	16.13	7.45E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-2	SO2	1.27	5.88E-04	**6E-04**	**3E-03**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	4.46E-03	2.06E-06	**2E-06**	**9E-06**
		EPA AP-42 Table 1.4-4	Butadiene, 1,3-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	1.59E-01	7.35E-05	**7E-05**	**3E-04**
		EPA AP-42 Table 1.4-3	n-Hexane	3.82	1.76E-03	**2E-03**	**0.01**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	POM	1.48E-03	6.85E-07	**7E-07**	**3E-06**
		EPA AP-42 Table 1.4-3	Toluene	7.22E-03	3.33E-06	**3E-06**	**1E-05**
		EPA AP-42 Table 1.4-3	TMP, 2,2,4-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Xylenes	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Other/Trace HAP	2.55E-03	1.18E-06	**1E-06**	**5E-06**
		Sum	Total HAP	3.99	1.85E-03	**2E-03**	**0.01**
		EPA AP-42 Table 1.4-2	CO2 (GWP=1)	253,214	116.98	**116.98**	**512.36**
		EPA AP-42 Table 1.4-2	CH4 (GWP=25)	4.77	2E-03	**2E-03**	**0.01**
		EPA AP-42 Table 1.4-2	N2O (GWP=298)	0.48	2E-04	**2E-04**	**1E-03**
		Weighted Sum	CO2e	253,476	117.10	**117.10**	**512.89**

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr.
2 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.
3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
4 - "Other/Trace HAPs" includes: CarbonTetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

Condensate Stabilizer By-Pass (STAB)

Source ID	Unit Description	Total STAB O/H Volume	STAB O/H Routed to FLR		Pre-Control VOC 50,225 Gas lb/MMscf		FLR Control %	VOC 50,225 lb/MMscf			CO2 (w/o Control) 350 Gas lb/MMscf		CH4 16,325 Gas lb/MMscf		CO2e CH4 GWP = 25	
		scf/hr	hr/yr	Mscf/yr	lb/hr	tpy		lb/hr (max)	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
STAB	Condensate Stabilizer By-Pass	7,282	120	873.80	5.01	21.94	98.0%	7.31	0.10	0.44	0.03	0.15	0.03	0.14	0.85	3.72
* lb/hr averaged over 8,760 hr/yr.			**TOTAL:**	**873.80**	**5.01**	**21.94**	**TOTAL:**	**7.31**	**0.10**	**0.44**	**0.03**	**0.15**	**0.03**	**0.14**	**0.85**	**3.72**
							Pre-Control:	365.72	5.01	21.94	0.03	0.15	1.63	7.13	40.74	178.46

Source ID	Unit Description	Benzene 25.00 Gas lb/MMscf		Ethylbenzene 25.00 Gas lb/MMscf		n-Hexane 925.00 Gas lb/MMscf		Methanol 25.00 Gas lb/MMscf		Toluene 25 Gas lb/MMscf		2,2,4-TMP 175.00 Gas lb/MMscf		Xylene 25.00 Gas lb/MMscf		Total HAP 1,225 Gas lb/MMscf	
		lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
STAB	Condensate Stabilizer By-Pass	5E-05	2E-04	5E-05	2E-04	2E-03	0.01	5E-05	2E-04	5E-05	2E-04	3E-04	2E-03	5E-05	2E-04	2E-03	0.01
* lb/hr averaged over 8,760 hr/yr.	**TOTAL:**	**5E-05**	**2E-04**	**5E-05**	**2E-04**	**2E-03**	**0.01**	**5E-05**	**2E-04**	**5E-05**	**2E-04**	**3E-04**	**2E-03**	**5E-05**	**2E-04**	**2E-03**	**0.01**
	Pre-Control:	2E-03	0.01	2E-03	0.01	0.09	0.40	2E-03	0.01	2E-03	0.01	0.02	0.08	2E-03	0.01	0.12	0.54

Notes:

1 - The results of a representative **Condensate Stabilizer Overheads Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Analysis):

Pollutant	Wet Gas	Worst Case	%Total	%VOC
CO2	299.55 lb/MMscf	**350.00 lb/MMscf**	0.42	0.70
Methane (CH4)	14,187 lb/MMscf	**16,325 lb/MMscf**	19.67	32.50
N2/Water/Ethane/Etc	24,734 lb/MMscf	**16,100 lb/MMscf**	19.40	32.06
VOC	43,655 lb/MMscf	**50,225 lb/MMscf**	60.51	100.00
TOTAL Gas	82,924 lb/MMscf	**83,000 lb/MMscf**	100.00	---
Benzene	0.09 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
Ethylbenzene	3.66 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
n-Hexane	794.48 lb/MMscf	**925.00 lb/MMscf**	1.11	1.84
Methanol (MeOH)	1.69 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
Toluene	1.44 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
2,2,4-TMP	132.21 lb/MMscf	**175.00 lb/MMscf**	0.21	0.35
Xylenes	5.24 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
Total HAP	938.81 lb/MMscf	**1,225 lb/MMscf**	1.48	2.44

2 - The condensate stabilizer overheads will normally be captured by a vapor recovery unit and routed to the facility inlet; however, for operating flexibility and during maintenance activities, the stabilizer overheads will be sent to the flare for up to 5 days per year (i.e., 120 hours) for 98% control of the vapors.

Condensate Stabilizer – Hot-Oil Heater (OH-01)

Source ID	Description	Reference	Pollutant	Emission Factor		Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy
OH-01	Hot-Oil Heater 3.35 MMBtu/hr (HHV) 1,020 Btu/scf (HHV) 8,760 hr/yr 3,284 scf/hr 28.77 MMscf/yr	EPA AP-42 Table 1.4-1	NOX	100	9.80E-02	**0.33**	**1.44**
		EPA AP-42 Table 1.4-1	CO	84	8.24E-02	**0.28**	**1.21**
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	5.32E-03	**0.02**	**0.08**
		EPA AP-42 Table 1.4-2	VOC	5.50	5.39E-03	**0.02**	**0.08**
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	7.45E-03	**0.02**	**0.11**
		EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	**2E-03**	**0.01**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	2.10E-03	2.06E-06	**7E-06**	**3E-05**
		EPA AP-42 Table 1.4-4	Butadiene, 1,3-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	7.50E-02	7.35E-05	**2E-04**	**1E-03**
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	POM	6.98E-04	6.85E-07	**2E-06**	**1E-05**
		EPA AP-42 Table 1.4-3	Toluene	3.40E-03	3.33E-06	**1E-05**	**5E-05**
		EPA AP-42 Table 1.4-3	TMP, 2,2,4-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Xylenes	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Other/Trace HAP	1.20E-03	1.18E-06	**4E-06**	**2E-05**
		Sum	Total HAP	1.88	1.85E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-2	CO2 (GWP=1)	119,317	116.98	**391.87**	**1,716**
		EPA AP-42 Table 1.4-2	CH4 (GWP=25)	2.25	2E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-2	N2O (GWP=298)	0.22	2E-04	**7E-04**	**3E-03**
		Weighted Sum	CO2e	119,440	117.10	**392.28**	**1,718**

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr.
2 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.
3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
4 -"Other/Trace HAPs" includes: CarbonTetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

Stabilized Condensate (SC) – Storage Tank (TK-01 thru TK-10)

Source ID	Source ID	Material Stored	Capacity	T-Put	PRE-CONTROL			VRU Control Efficiency	100% VOC		CO2 (w/o Control) 0.42% Total		CH4 19.67% Total		CO2e CH4 GWP = 25	
					W+B	Flash	Total									
			bbl	bbl/yr	lb/yr	lb/yr	lb/yr		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-01-10	TK-01	Stabilized Condensate	400	27,375	11,102	---	11,102	98% (Allowance for 2% downtime)	0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-02	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-03	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-04	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-05	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-06	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-07	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-08	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-09	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-10	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
			4,000	**273,750**			**111,021**	**TOTAL:**	**0.25**	**1.11**	**0.05**	**0.23**	**0.05**	**0.22**	**1.30**	**5.69**
	bbl/day/tank:	**75**	Mgal/yr:	11,498				PRE-Control (Each):	1.27	5.55	0.27	1.17	0.25	1.09	6.50	28.47
			Turnovers/yr:	68.44				PRE-Control (Total):	12.67	55.51	2.67	11.70	2.49	10.92	64.99	284.66

Source ID	Tank ID	Benzene 0.05% Total		Ethylbenzene 1.26% Total		n-Hexane 4.63% Total		Methanol 0.03% Total		Toluene 0.63% Total		2,2,4-TMP 0.43% Total		Xylene 1.64% Total		Total HAP 8.67% Total	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-01-10	TK-01	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-02	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-03	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-04	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-05	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-06	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-07	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-08	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-09	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-10	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TOTAL:	**1E-04**	**5E-04**	**3E-03**	**0.01**	**0.01**	**0.05**	**8E-05**	**4E-04**	**2E-03**	**0.01**	**1E-03**	**5E-03**	**4E-03**	**0.02**	**0.02**	**0.10**
	PRE-Control (Each):	6E-04	3E-03	0.02	0.07	0.06	0.26	4E-04	2E-03	0.01	0.04	5E-03	0.02	0.02	0.09	0.11	0.48
	PRE-Control (Total):	0.01	0.03	0.16	0.70	0.59	2.57	4E-03	0.02	0.08	0.35	0.05	0.24	0.21	0.91	1.10	4.81

Notes: 1 - EPA TANKS 4.0.9d was used to determine working and breathing losses from each (of 10) Stabilized Condensate Storage Tanks - See Supplement S4 - Emission Programs.

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

Emissions Report for: Annual

AMS-Miller CS - Vertical Fixed Roof Tank
New Martinsville, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 15.0)	7,736.15	3,365.94	11,102.09

Produced Fluid/Water (PW) – Storage Tank (WTK-11 and WTK-12)

Source ID	Tank ID	Material Stored	Capacity	T-Put	PRE-CONTROL			VRU Control Efficiency	100% VOC		CO2 (w/o Control) 0.42% Total		CH4 19.67% Total		CO2e CH4 GWP = 25	
					W+B	Flash	Total									
			bbl	bbl/yr	lb/yr	lb/yr	lb/yr		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-11-12	WTK-11	Produced Fluid/Water	400	18,250	5,102	---	5,102	98.0%	0.01	0.05	2E-03	0.01	2E-03	0.01	0.06	0.26
	WTK-12	Produced Fluid/Water	400	18,250	5,102	---	5,102		0.01	0.05	2E-03	0.01	2E-03	0.01	0.06	0.26
			800	**36,500**			**10,204**	**TOTAL:**	**0.02**	**0.10**	**5E-03**	**0.02**	**5E-03**	**0.02**	**0.12**	**0.52**
								PRE-Control (Each):	0.58	2.55	0.12	0.54	0.11	0.50	2.99	13.08
								PRE-Control (Total):	1.16	5.10	0.25	1.08	0.23	1.00	5.97	26.16

bbl/day/tank: 50

Mgal-VOC/yr: 1,533

Turnovers: 45.63

Source ID	Tank ID	Benzene 0.05% Total		Ethylbenzene 1.26% Total		n-Hexane 4.63% Total		Methanol 0.03% Total		Toluene 0.63% Total		2,2,4-TMP 0.43% Total		Xylene 1.64% Total		Total HAP 8.67% Total	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-11-12	WTK-11	6E-06	2E-05	1E-04	6E-04	5E-04	2E-03	4E-06	2E-05	7E-05	3E-04	5E-05	2E-04	2E-04	8E-04	1E-03	4E-03
	WTK-12	6E-06	2E-05	1E-04	6E-04	5E-04	2E-03	4E-06	2E-05	7E-05	3E-04	5E-05	2E-04	2E-04	8E-04	1E-03	4E-03
	TOTAL:	**1E-05**	**5E-05**	**3E-04**	**1E-03**	**1E-03**	**5E-03**	**8E-06**	**3E-05**	**1E-04**	**6E-04**	**1E-04**	**4E-04**	**4E-04**	**2E-03**	**2E-03**	**0.01**
PRE-Control (Each):		3E-04	1E-03	0.01	0.03	0.03	0.12	2E-04	8E-04	4E-03	0.02	3E-03	0.01	0.01	0.04	0.05	0.22
PRE-Control (Total):		6E-04	2E-03	0.01	0.06	0.05	0.24	4E-04	2E-03	0.01	0.03	5E-03	0.02	0.02	0.08	0.10	0.44

Notes: 1 - EPA TANKS 4.0.9d was used to determine working and breathing losses from each (of 2) Produced Fluid/Water Storage Tanks - See Supplement S4 - Emission Programs.

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

Emissions Report for: Annual

AMS-Miller CS-Produced Fluids/Water- - Vertical Fixed Roof Tank
Bannen, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 15.0)	1,735.95	3,365.94	5,101.89

Stabilized Condensate (SC) - Truck Load-Out (LOR)

Source ID	Description	S	P	M	T	Carbon Canister	L_L	T-Put	Total Off-Gas 100.00% Total		VOC 100.00% Total	
		sat. fac.	psia	lb/lb-mol	°R	CE %	lb/Mgal	Mgal/yr	lb/hr	tpy	lb/hr	tpy
LOR	Truck Load-Out - SC	0.60	7.93	60.00	513	66.5%	2.32	11,498	3.05	13.34	3.05	13.34
* lb/hr is the averaged over 8,760 hr/yr								**TOTAL:**	**3.05**	**13.34**	**3.05**	**13.34**
								Pre-Control:	9.09	39.8	9.09	39.8

Source ID	Benzene 0.03% Total		Ethylbenzene 0.03% Total		n-Hexane 1.11% Total		Methanol 0.03% Total		Toluene 0.03% Total		2,2,4-TMP 0.21% Total		Xylene 0.03% Total		Total HAP 1.48% Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
LOR	9E-04	4E-03	9E-04	4E-03	0.03	0.15	9E-04	4E-03	9E-04	4E-03	0.01	0.03	9E-04	4E-03	0.04	0.20
TOTAL:	**9E-04**	**4E-03**	**9E-04**	**4E-03**	**0.03**	**0.15**	**9E-04**	**4E-03**	**9E-04**	**4E-03**	**0.01**	**0.03**	**9E-04**	**4E-03**	**0.04**	**0.20**
Pre-Cont:	3E-03	0.01	3E-03	0.01	0.10	0.44	3E-03	0.01	3E-03	0.01	0.02	0.08	3E-03	0.01	0.13	0.59

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

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

where: L_L = loading loss, lb/1000 gal of liquid loaded; S = saturation factor, use 0.60 for submerged fill.; P = true vapor pressure of liquid loaded, psia.; M = molecular weight of vapors, lb/lb-mol.; T = temperature of bulk liquid loaded, °R = °F + 460; CE = overall emission reduction efficiency (collection efficiency x control efficiency).

2 - For condensate loading, the collection efficiency is 70% for tanker trucks not subject to annual leak test.

3 - Emissions from loading of stabilized condensate are controlled with 95% efficient Carbon Canister

4 - Stabilized condensate (SC) vapor pressure, molecular weight, and temperature are from EPA TANKS 4.0.9d output.

5 - The total stabilized condensate storage tank capacity at the facility is: **4,000** bbl = **168,000** gal.

6 - The maxium stabilized condensate throughput at the facility is: **273,750** bbl/yr = **11,497,500** gal/yr = **68.44** t-o/yr

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

AMS-Miller CS - Vertical Fixed Roof Tank
New Martinsville, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 15.0)	All	58.50	49.32	67.67	53.39	7.9267	6.6758	9.3559	60.0000			92.00	Option 4: RVP=15, ASTM Slope=3

Produced Fluid/Water (PW) – Truck Load-Out (WLOR)

Source ID	Description	S	P	M	T	Carbon Canister	L_L	T-Put	Total Off-Gas 100.00% Total		VOC 10.00% Total	
		sat. fac.	psia	lb/lb-mol	°R	CE %	lb/Mgal	Mgal/yr	lb/hr	tpy	lb/hr	tpy
WLOR	Truck Load-Out - PW	0.60	7.93	60.00	513	66.5%	2.32	1,533	0.41	1.78	0.04	0.18
* lb/hr is the averaged over 8,760 hr/yr								**TOTAL:**	**0.41**	**1.78**	**0.04**	**0.18**
								PRE-Control:	1.21	5.31	0.12	0.53

Source ID	Benzene 0.003% Total		Ethylbenzene 0.003% Total		n-Hexane 0.111% Total		Methanol 0.003% Total		Toluene 0.003% Total		2,2,4-TMP 0.021% Total		Xylene 0.003% Total		Total HAP 0.148% Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
WLOR	1E-05	5E-05	1E-05	5E-05	5E-05	2E-04	1E-06	5E-06	1E-06	5E-06	9E-06	4E-05	1E-06	5E-06	6E-05	3E-04
TOTAL:	**1E-05**	**5E-05**	**1E-05**	**5E-05**	**5E-05**	**2E-04**	**1E-06**	**5E-06**	**1E-06**	**5E-06**	**9E-06**	**4E-05**	**1E-06**	**5E-06**	**6E-05**	**3E-04**
PRE-Cont:	4E-05	2E-04	4E-05	2E-04	1E-04	6E-04	4E-06	2E-05	4E-06	2E-05	3E-05	1E-04	4E-06	2E-05	2E-04	8E-04

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

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

where: L_L = loading loss, lb/1000 gal of liquid loaded; M = molecular weight of vapors, lb/lb-mol.; S = saturation factor, use 0.60 for submerged fill.; T = temperature of bulk liquid loaded, °R = °F + 460; P = true vapor pressure of liquid loaded, psia.; CE = overall emission reduction efficiency (collection efficiency x control efficiency).

2 - For produced fluid/water loading, the collection efficiency is 70% for tanker trucks not subject to annual leak test.

3 - Emissions from loading of stabilized condensate are controlled with 95% efficient Carbon Canister

4 - Stabilized condensate (SC) vapor pressure, molecular weight, and temperature are from EPA TANKS 4.0.9d output.

5 - The total produced fluid/water storage tank capacity at the facility is: **800** bbl = **33,600** gal

6 - The maxium produced fluid/water throughput at the facility is: **36,500** bbl/yr = **1,533,000** gal/yr = **45.63** turn-overs/yr

Pigging Operation (PIG)

Source ID	Description	PIG Volume scf/Event	Pigging Events/yr	Total Gas/Vapor scf/yr	Control %	VOC 8,200 lb/MMscf lb/hr	VOC 8,200 lb/MMscf tpy	CO2 300.00 lb/MMscf lb/hr	CO2 300.00 lb/MMscf tpy	CH4 39,800.00 lb/MMscf lb/hr	CH4 39,800.00 lb/MMscf tpy	CO2e CH4 GWP = 25 lb/hr	CO2e CH4 GWP = 25 tpy
PIG	4" Trap (HVL PCF)	24	104	2,496	na	2E-03	0.01	9E-05	4E-04	1E-02	0.05	0.28	1.24
	4" Trap (HVL CDP)	24	104	2,496		2E-03	0.01	9E-05	4E-04	1E-02	0.05	0.28	1.24
	10" Trap (CDP)	162	104	16,848		0.02	0.07	6E-04	3E-03	0.08	0.34	1.91	8.38
	12" Trap (Discharge)	303	104	31,512		0.03	0.13	1E-03	5E-03	0.14	0.63	3.58	15.68
	16" Trap (Greene Co.)	478	104	49,712		0.05	0.20	2E-03	0.01	0.23	0.99	5.65	24.74
	16" Trap (Whiteman)	478	104	49,712		0.05	0.20	2E-03	0.01	0.23	0.99	5.65	24.74
	TOTAL:		**624**	**152,776**		**0.14**	**0.63**	**TOTAL:**	**0.01**	**0.02**	**0.69**	**3.04**	**17.36**	**76.03**
	PRE-Control:					0.14	0.63		0.01	0.02	0.69	3.04	17.36	76.03

Source ID	Description	Benzene 25.00 lb/MMscf lb/hr	Benzene 25.00 lb/MMscf tpy	E-Benzene 25.00 lb/MMscf lb/hr	E-Benzene 25.00 lb/MMscf tpy	n-Hexane 125.00 lb/MMscf lb/hr	n-Hexane 125.00 lb/MMscf tpy	Methane 100.00 lb/MMscf lb/hr	Methane 100.00 lb/MMscf tpy	Toluene 25.00 lb/MMscf lb/hr	Toluene 25.00 lb/MMscf tpy	2,2,4-TMP 25.00 lb/MMscf lb/hr	2,2,4-TMP 25.00 lb/MMscf tpy	Xylene 25.00 lb/MMscf lb/hr	Xylene 25.00 lb/MMscf tpy	Tot HAP 350.00 lb/MMscf lb/hr	Tot HAP 350.00 lb/MMscf tpy
PIG	4" Trap (HVL PCF)	7E-06	3E-05	7E-06	3E-05	4E-05	2E-04	3E-05	1E-04	7E-06	3E-05	7E-06	3E-05	7E-06	3E-05	1E-04	4E-04
	4" Trap (HVL CDP)	7E-06	3E-05	7E-06	3E-05	4E-05	2E-04	3E-05	1E-04	7E-06	3E-05	7E-06	3E-05	7E-06	3E-05	1E-04	4E-04
	10" Trap (CDP)	5E-05	2E-04	5E-05	2E-04	2E-04	1E-03	2E-04	8E-04	5E-05	2E-04	5E-05	2E-04	5E-05	2E-04	7E-04	3E-03
	12" Trap (Discharge)	9E-05	4E-04	9E-05	4E-04	4E-04	2E-03	4E-04	2E-03	9E-05	4E-04	9E-05	4E-04	9E-05	4E-04	1E-03	0.01
	16" Trap (Greene Co.)	1E-04	6E-04	1E-04	6E-04	7E-04	3E-03	6E-04	2E-03	1E-04	6E-04	1E-04	6E-04	1E-04	6E-04	2E-03	0.01
	16" Trap (Whiteman)	1E-04	6E-04	1E-04	6E-04	7E-04	3E-03	6E-04	2E-03	1E-04	6E-04	1E-04	6E-04	1E-04	6E-04	2E-03	0.01
	TOTAL:	**4E-04**	**2E-03**	**4E-04**	**2E-03**	**2E-03**	**0.01**	**2E-03**	**0.01**	**4E-04**	**2E-03**	**4E-04**	**2E-03**	**4E-04**	**2E-03**	**0.01**	**0.03**
	PRE-Control:	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03

Notes: 1 - The results of a representative **Wet Gas Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency: 15%		
Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
CO2	194.76 lb/MMscf	**300.00 lb/MMscf**	0.58	---
Methane (CH4)	34,560 lb/MMscf	**39,800 lb/MMscf**	76.54	---
N2/Water/Ethane/Etc	10,155 lb/MMscf	**3,700 lb/MMscf**	7.12	---
VOC	7,049 lb/MMscf	**8,200 lb/MMscf**	15.77	100.00
TOTAL Gas	51,959 lb/MMscf	**52,000 lb/MMscf**	100.00	---
Benzene	2.06 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Ethylbenzene	0.28 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
n-Hexane	104.58 lb/MMscf	**125.00 lb/MMscf**	0.24	1.52
Methanol	84.35 lb/MMscf	**100.00 lb/MMscf**	0.19	1.22
Toluene	2.43 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
2,2,4-TMP	2.41 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Xylenes	6.99 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Total HAP	203.09 lb/MMscf	**350.00 lb/MMscf**	0.67	4.27

Dehydrator/Stabilizer Flare (FLR)

Source ID	Description	Reference	Pollutant	Emission Factor		Combustion Emissions			Total FLR Emissions (Combustion + 3*STL +STAB)		
				lb/MMscf	lb/MMBtu	lb/hr (max)	lb/hr (ave)	tpy	lb/hr (max)	lb/hr (ave)	tpy
FLR	Dehydrator/Stabilizer Flare Controls DHY-01 thru DHY-03 Flash-Tank and Stabilizer Overhead Emissions Site Rating 20.00 MMBtu/hr (HHV) (max) 5.00 MMBtu/hr (HHV) (ave) Current: 42.18 MMBtu/hr (HHV) 98.0% Control Efficiency 1,504 Btu/scf (HHV) 13,000 scf/hr (max) 3,250 scf/hr (ave) 312,000 scfd (max) 78,000 scfd (ave) 28.47 MMscf/yr	EPA AP-42 Table 1.4-1	NOX	147.42	0.10	**1.96**	**0.49**	**2.15**	**1.96**	**0.49**	**2.15**
		EPA AP-42 Table 13.5-1	CO	466.13	0.31	**6.20**	**1.55**	**6.79**	**6.20**	**1.55**	**6.79**
		EPA AP-42 Table 1.4-2	NMNEHC	8.00	0.01	**0.11**	**0.03**	**0.12**	**12.73**	**5.17**	**22.64**
		EPA AP-42 Table 1.4-2	VOC	8.11	0.01	**0.11**	**0.03**	**0.12**	**12.73**	**5.17**	**22.64**
		EPA AP-42 Table 1.4-2	PM10/2.5	11.20	0.01	**0.15**	**0.04**	**0.16**	**0.15**	**0.04**	**0.16**
		EPA AP-42 Table 1.4-2	SO2	8.84E-01	5.9E-04	**0.01**	**3E-03**	**0.01**	**0.01**	**3E-03**	**0.01**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	**---**	**---**	**---**	**---**	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	**---**	**---**	**---**	**---**	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	3.10E-03	2.1E-06	**4E-05**	**1E-05**	**5E-05**	**0.16**	**0.14**	**0.62**
		EPA AP-42 Table 1.4-4	1,3-Butadiene	---	---	**---**	**---**	**---**	**---**	**---**	**---**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	**---**	**---**	**---**	**0.02**	**2E-04**	**1E-03**
		EPA AP-42 Table 1.4-3	Formaldehyde	1.11E-01	7.4E-05	**1E-03**	**4E-04**	**2E-03**	**1E-03**	**4E-04**	**2E-03**
		EPA AP-42 Table 1.4-3	n-Hexane	2.65	1.8E-03	**0.04**	**0.01**	**0.04**	**0.79**	**0.18**	**0.78**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**	**---**	**0.55**	**0.27**	**1.16**
		EPA AP-42 Table 1.4-3	POM/PAH	1.03E-03	6.8E-07	**1E-05**	**3E-06**	**1E-05**	**1E-05**	**3E-06**	**1E-05**
		EPA AP-42 Table 1.4-3	Toluene	5.01E-03	3.3E-06	**7E-05**	**2E-05**	**7E-05**	**0.21**	**0.20**	**0.86**
		EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	**---**	**---**	**---**	**0.12**	**0.00**	**0.02**
		EPA AP-42 Table 1.4-3	Xylenes	---	---	**---**	**---**	**---**	**1.35**	**0.67**	**2.92**
		EPA AP-42 Table 1.4-3	Other/Trace HAP	1.77E-03	1.2E-06	**2E-05**	**6E-06**	**3E-05**	**2E-05**	**6E-06**	**3E-05**
		Sum	Total HAP	2.77	1.8E-03	**0.04**	**0.01**	**0.04**	**3.18**	**1.45**	**6.36**
		EPA AP-42 Table 1.4-2	CO2 (GWP=1)	176,898	117.65	**2,353**	**588.24**	**2,576**	**2,362**	**595.10**	**2,607**
		EPA AP-42 Table 1.4-2	CH4 (GWP=25)	3.39	2.3E-03	**0.05**	**0.01**	**0.05**	**4.25**	**1.87**	**8.19**
		EPA AP-42 Table 1.4-2	N2O (GWP=298)	3.24	2.2E-03	**0.04**	**0.01**	**0.05**	**62.03**	**0.86**	**3.77**
		Weighted Sum	CO2e	177,950	118.35	**2,367**	**591.73**	**2,592**	**20,953**	**898.10**	**3,934**

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

2 - Heat Input to Flare 03 is determined as follows:

Waste/Pilot Gas Stream	scf/hr (max)	scf/hr (ave)	Btu/scf (HHV)	MMBtu/hr (max)	MMBtu/hr (ave)	Source(s)
Dehy 01 Flash-Tank Off-Gas	851	846	1,524	1.30	1.29	See Supplements: S3 - Btu Loading, S5 - Vendor Data, and S6 - Emission Programs
Dehy 02 Flash-Tank Off-Gas	851	846	1,524	1.30	1.29	
Dehy 03 Flash-Tank Off-Gas	851	846	1,524	1.30	1.29	
Stab O/H (120 hr/yr)	7,282	100	1,832	13.34	0.18	
Purge, Fuel, and Pilot Gas	175	175	1,020	0.18	0.18	
15% Contingency	1,501	421.91	1,504	2.26	0.63	
Total Gas to Flare:	**11,510**	**3,235**	**1,504**	**19.66**	**4.86**	
	276,234 scfd	**77,632 scfd**	**Round-Up:**	**20.00**	**5.00**	
Round-Up:	**312,000 scfd**	**78,000 scfd**				

3 - The condensate stabilizer overheads will normally be captured by a vapor recovery unit and routed to the facility inlet; however, for operating flexibility and during maintenance activities, the stabilizer overheads will be sent to the flare for up to 5 days per year (i.e., 120 hours) for 98% control of the vapors.

Flare (FLR) Loading

Component	Component Btu/scf	Total Dehydrator Flash-Tank and Condensate Stabilizer By-Pass to FLR						Total Load to FLR		
		Elec Pump:	2,538 scfh (3 STL		Stab O/H	99.75 scfh (av)				
		8,760 hr/yr	22.23 MMscfyr		120 hr/yr	0.01 MMscfyr		8,760 hr/yr	2,638 scfh (ave)	
		Mole % (M% = V%)	Gas Btu/scf	lb/hr (ave)	Mole % (M% = V%)	Gas Btu/scf	lb/hr (ave)	Mole % (M% = V%)	Gas Btu/scf	lb/hr (ave)
Water	---	3.42E-02	---	1.37E-02	5.25E-02	---	2.88E-04	3.44E-02	---	1.40E-02
Carbon Dioxide	---	9.37E-01	---	9.20E-01	2.58E-01	---	3.47E-03	9.28E-01	---	9.23E-01
Nitrogen	---	2.14E-01	---	1.34E-01	3.21E-02	---	2.76E-04	2.12E-01	---	1.34E-01
Methane*	1,010	6.34E+01	640.34	2.27E+01	3.36E+01	338.95	1.65E-01	6.30E+01	636.27	2.29E+01
Ethane*	1,770	2.43E+01	430.04	1.63E+01	3.12E+01	552.43	2.87E-01	2.44E+01	431.69	1.66E+01
Propane**	2,516	7.32E+00	184.19	7.20E+00	2.89E+01	727.13	3.89E-01	7.61E+00	191.52	7.59E+00
i-Butane**	3,252	9.92E-01	32.26	1.29E+00	1.79E+00	58.34	3.20E-02	1.00E+00	32.61	1.32E+00
n-Butane**	3,262	1.75E+00	57.09	2.27E+00	2.56E+00	83.42	4.54E-02	1.76E+00	57.45	2.32E+00
Cyclopentane**	3,764	---	---	---	---	---	---	---	---	---
i-Pentane**	4,001	3.80E-01	15.20	6.11E-01	6.03E-01	24.14	1.33E-02	3.83E-01	15.32	6.24E-01
n-Pentane**	4,009	3.41E-01	13.67	5.49E-01	4.79E-01	19.21	1.06E-02	3.43E-01	13.75	5.60E-01
Cyclohexane**	4,482	1.10E-02	0.49	2.06E-02	---	---	---	1.09E-02	0.49	2.06E-02
Other Hexanes**	4,750	1.98E-01	9.41	3.81E-01	---	---	---	1.95E-01	9.28	3.81E-01
Methylcyclohexane**	5,216	1.54E-02	0.80	3.37E-02	---	---	---	1.52E-02	0.79	3.37E-02
Heptanes**	5,503	5.92E-02	3.26	1.32E-01	1.45E-01	7.97	4.43E-03	6.04E-02	3.32	1.36E-01
C8+ Heavies**	7,000	3.79E-03	0.27	1.44E-02	9.20E-03	0.64	4.79E-04	3.86E-03	0.27	1.49E-02
Benzene***	3,742	2.42E-03	0.09	4.21E-03	4.32E-05	1.6E-03	1.03E-06	2.39E-03	0.09	4.21E-03
Ethylbenzene***	5,222	1.07E-04	0.01	2.52E-04	1.31E-03	6.8E-02	4.22E-05	1.23E-04	0.01	2.94E-04
n-Hexane***	4,756	8.42E-02	4.00	1.62E-01	3.50E-01	16.64	9.22E-03	8.78E-02	4.18	1.71E-01
Methanol***	867	1.53E+01	132.64	1.33E+00	2.00E-03	1.7E-02	2.38E-06	1.51E+01	130.84	1.33E+00
Toluene***	4,475	1.80E-03	0.08	3.69E-03	5.93E-04	2.7E-02	1.67E-05	1.78E-03	0.08	3.71E-03
2,2,4-TMP (i-Octane)***	6,214	9.34E-04	0.06	2.38E-03	4.39E-02	2.73	1.53E-03	1.51E-03	0.09	3.91E-03
Xylenes***	5,209	3.79E-03	0.20	5.45E-03	1.87E-03	0.10	3.69E-05	3.76E-03	0.20	5.49E-03
		115.35	Btu/scf	lb/hr (ave)	100.00	Btu/scf	lb/hr (ave)	115.14	Btu/scf	lb/hr (ave)
			1,524	54.08		1,832	0.96		1,528	55.04

MMBtu/hr (ave)	3.87	
MMBtu/hr (max)	3.87	
MMBtu/hr (ave)	0.18	
MMBtu/hr (max)	13.34	
Base Load - MMBtu/hr	4.03	
Add Purge/Pilot - MMBtu/hr	0.18	
Add Contingency - MMBtu/hr	0.63	
Total Load - MMBtu/hr	4.84	
Round-Up - MMBtu/hr	5.00	

Process Piping and Equipment Leak (FUG-G) – Gas/Vapor

Source ID	Description	Component (Unit) Type (Gas)	Unit Count	Leak Factor lb/hr/Unit	LDAR Control Credit	Controlled Leaks lb/hr	Controlled Leaks tpy	VOC 15.769 Wgt% lb/hr	VOC 15.769 Wgt% tpy	CO2 0.577 Wgt% lb/hr	CO2 0.577 Wgt% tpy	CH4 76.538 Wgt% lb/hr	CH4 76.538 Wgt% tpy	CO2e CH4 GWP = 25 lb/hr	CO2e CH4 GWP = 25 tpy
FUG-G	Process Piping and Equipment Leaks (Gas/Vapor)	Valves	1,440	9.92E-03	92%	1.14	5.01	0.18	0.79	0.01	0.03	0.87	3.83	21.88	95.81
		Pump Seals	---	5.29E-03	---	---	---	---	---	---	---	---	---	---	---
		Other	108	1.94E-02	---	2.10	9.18	0.33	1.45	0.01	0.05	1.60	7.02	40.10	175.66
		Connectors	4,699	4.41E-04	93%	0.15	0.64	0.02	0.10	8E-04	4E-03	0.11	0.49	2.78	12.16
		Flanges	1,175	8.60E-04	---	1.01	4.42	0.16	0.70	0.01	0.03	0.77	3.39	19.33	84.67
		Open-ended Lines	50	4.41E-03	---	0.22	0.97	0.04	0.15	1E-03	0.01	0.17	0.74	4.25	18.63
		TOTAL:	**7,472**				**TOTAL:**	**0.73**	**3.19**	**TOTAL:**	**0.03**	**0.12**	**3.53**	**15.47**	**88.34**	**386.93**
		PRE-Control:						3.10	13.60		0.11	0.50	15.07	65.99	376.78	1,650

Source ID	Description	Component (Unit) Type (Gas)	Benzene 0.048 Wgt% lb/hr	Benzene 0.048 Wgt% tpy	Ethylbenzene 0.048 Wgt% lb/hr	Ethylbenzene 0.048 Wgt% tpy	n-Hexane 0.240 Wgt% lb/hr	n-Hexane 0.240 Wgt% tpy	Methanol 0.192 Wgt% lb/hr	Methanol 0.192 Wgt% tpy	Toluene 0.048 Wgt% lb/hr	Toluene 0.048 Wgt% tpy	2,2,4-TMP 0.048 Wgt% lb/hr	2,2,4-TMP 0.048 Wgt% tpy	Xylenes 0.048 Wgt% lb/hr	Xylenes 0.048 Wgt% tpy	Total HAP 0.673 Wgt% lb/hr	Total HAP 0.673 Wgt% tpy
FUG-G	Process Piping and Equipment Leaks (Gas/Vapor)	Valves	5E-04	2E-03	5E-04	2E-03	3E-03	0.01	2E-03	0.01	5E-04	2E-03	5E-04	2E-03	5E-04	2E-03	0.01	0.03
		Pump Seals	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Other	1E-03	4E-03	1E-03	4E-03	0.01	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
		Connectors	7E-05	3E-04	7E-05	3E-04	3E-04	2E-03	3E-04	1E-03	7E-05	3E-04	7E-05	3E-04	7E-05	3E-04	1E-03	4E-03
		Flanges	5E-04	2E-03	5E-04	2E-03	2E-03	0.01	2E-03	0.01	5E-04	2E-03	5E-04	2E-03	5E-04	2E-03	0.01	0.03
		Open-ended Lines	1E-04	5E-04	1E-04	5E-04	5E-04	2E-03	4E-04	2E-03	1E-04	5E-04	1E-04	5E-04	1E-04	5E-04	1E-03	0.01
		TOTAL:	**2E-03**	**0.01**	**2E-03**	**0.01**	**0.01**	**0.05**	**0.01**	**0.04**	**2E-03**	**0.01**	**2E-03**	**0.01**	**2E-03**	**0.01**	**0.03**	**0.14**
		PRE-Control:	0.01	0.04	0.01	0.04	0.05	0.21	0.04	0.17	0.01	0.04	0.01	0.04	0.01	0.04	0.13	0.58

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

2 - Gas/Vapor emissions calculated using EPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Nov 1995; Table 2-4, Oil and Gas Production Operations:

Equipment Type	Gas kg/hr	Gas lb/hr/unit	Light Liquid kg/hr	Light Liquid lb/hr/unit	Water/Oil kg/hr	Water/Oil lb/hr/unit
Valves	4.5E-03	9.92E-03	2.5E-03	5.51E-03	9.8E-05	2.16E-04
Pump Seals	2.4E-03	5.29E-03	1.3E-02	2.87E-02	2.4E-05	5.29E-05
Others	8.8E-03	1.94E-02	7.5E-03	1.65E-02	1.4E-02	3.09E-02
Connectors	2.0E-04	4.41E-04	2.1E-04	4.63E-04	1.1E-04	2.43E-04
Flanges	3.9E-04	8.60E-04	1.1E-04	2.43E-04	2.9E-06	6.39E-06
Open-Ended Lines	2.0E-03	4.41E-03	1.4E-03	3.09E-03	2.5E-04	5.51E-04

3 - "Other" components include pressure relief devices (PRD), compressors, diaphragms, drains, meters, etc.

4 - Component counts based on engineering judgment .

4 - The results of a representative **Wet Gas Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency:	15%
Pollutant	**Wet Gas**	**Worst Case**	**Wgt%**	**VOC%**
CO2	194.76 lb/MMscf	300.00 lb/MMscf	**0.577**	---
Methane (CH4)	34,560 lb/MMscf	39,800 lb/MMscf	**76.538**	---
N2/Water/Ethane/Etc	10,155 lb/MMscf	3,700 lb/MMscf	**7.115**	---
VOC	7,049 lb/MMscf	8,200 lb/MMscf	**15.769**	100.000
TOTAL Gas	51,959 lb/MMscf	52,000 lb/MMscf	**100.000**	---
Benzene	2.06 lb/MMscf	25.00 lb/MMscf	**0.048**	0.305
Ethylbenzene	0.28 lb/MMscf	25.00 lb/MMscf	**0.048**	0.305
n-Hexane	104.58 lb/MMscf	125.00 lb/MMscf	**0.240**	1.524
Methanol	84.35 lb/MMscf	100.00 lb/MMscf	**0.192**	1.220
Toluene	2.43 lb/MMscf	25.00 lb/MMscf	**0.048**	0.305
2,2,4-TMP	2.41 lb/MMscf	25.00 lb/MMscf	**0.048**	0.305
Xylenes	6.99 lb/MMscf	25.00 lb/MMscf	**0.048**	0.305
Total HAP	203.09 lb/MMscf	350.00 lb/MMscf	**0.673**	4.268

6 - LDAR Control Credit from EPA document "Leak Detection and Repair Compliance Assistance Guidance — A Best Practices Guide" Table 4-1, 500 ppm Leak Definition (i.e., NSPS OOOOa monitoring).

Process Piping and Equipment Leak (FUG-L) – Light Liquid/Oil

Source ID	Description	Component (Unit) Type (Light Liquid)	Unit Count	Leak Factor lb/hr/Unit	LDAR Control Credit	Controlled Leaks lb/hr	Controlled Leaks tpy	VOC 100.000 Wgt% lb/hr	VOC 100.000 Wgt% tpy	CO2 --- Wgt% lb/hr	CO2 --- Wgt% tpy	CH4 --- Wgt% lb/hr	CH4 --- Wgt% tpy	CO2e CH4 GWP = 25 lb/hr	CO2e CH4 GWP = 25 tpy
FUG-L	Process Piping and Equipment Leaks (Light Liquid/Oil)	Valves	576	5.51E-03	88%	0.38	1.67	0.38	1.67	---	---	---	---	---	---
		Pump Seals	12	2.87E-02	75%	0.09	0.38	0.09	0.38	---	---	---	---	---	---
		Other	43	1.65E-02	---	0.71	3.13	0.71	3.13	---	---	---	---	---	---
		Connectors	1,296	4.63E-04	93%	0.04	0.18	0.04	0.18	---	---	---	---	---	---
		Flanges	324	2.43E-04	---	0.08	0.34	0.08	0.34	---	---	---	---	---	---
		Open-ended Lines	20	3.09E-03	---	0.06	0.27	0.06	0.27	---	---	---	---	---	---
		TOTAL:	**2,271**				**TOTAL:**	**1.36**	**5.97**	**TOTAL:**		**---**	**---**	**---**	**---**	**---**	**---**
		PRE-Control:						4.97	21.78			---	---	---	---	---	---

Source ID	Description	Component (Unit) Type (Light Liquid)	Benzene 0.049 %VOC lb/hr	Benzene 0.049 %VOC tpy	Ethylbenzene 1.257 %VOC lb/hr	Ethylbenzene 1.257 %VOC tpy	n-Hexane 4.632 %VOC lb/hr	n-Hexane 4.632 %VOC tpy	Methanol 0.032 %VOC lb/hr	Methanol 0.032 %VOC tpy	Toluene 0.633 %VOC lb/hr	Toluene 0.633 %VOC tpy	2,2,4-TMP 0.430 %VOC lb/hr	2,2,4-TMP 0.430 %VOC tpy	Xylenes 1.639 %VOC lb/hr	Xylenes 1.639 %VOC tpy	Total HAP 8.671 %VOC lb/hr	Total HAP 8.671 %VOC tpy
FUG-L	Process Piping and Equipment Leaks (Light Liquid/Oil)	Valves	2E-04	8E-04	5E-03	0.02	0.02	0.08	1E-04	5E-04	2E-03	0.01	2E-03	0.01	0.01	0.03	0.03	0.14
		Pump Seals	4E-05	2E-04	1E-03	0.00	4E-03	0.02	3E-05	1E-04	5E-04	2E-03	4E-04	2E-03	1E-03	0.01	0.01	0.03
		Other	3E-04	2E-03	0.01	0.04	0.03	0.14	2E-04	1E-03	5E-03	0.02	3E-03	0.01	0.01	0.05	0.06	0.27
		Connectors	2E-05	9E-05	5E-04	2E-03	2E-03	0.01	1E-05	6E-05	3E-04	1E-03	2E-04	8E-04	7E-04	3E-03	4E-03	0.02
		Flanges	4E-05	2E-04	1E-03	4E-03	4E-03	0.02	3E-05	1E-04	5E-04	2E-03	3E-04	1E-03	1E-03	0.01	0.01	0.03
		Open-ended Lines	3E-05	1E-04	8E-04	3E-03	3E-03	0.01	2E-05	9E-05	4E-04	2E-03	3E-04	1E-03	1E-03	4E-03	0.01	0.02
		TOTAL:	**7E-04**	**3E-03**	**0.02**	**0.08**	**0.06**	**0.28**	**4E-04**	**2E-03**	**0.01**	**0.04**	**0.01**	**0.03**	**0.02**	**0.10**	**0.12**	**0.52**
		PRE-Control:	2E-03	0.01	0.06	0.27	0.23	1.01	2E-03	0.01	0.03	0.14	0.02	0.09	0.08	0.36	0.43	1.89

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

2 - Light Liquid emissions calculated using EPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Nov 1995; Table 2-4, Oil and Gas Production Operations:

Equipment Type	Gas kg/hr	Gas lb/hr/unit	Light Liquid kg/hr	Light Liquid lb/hr/unit	Water/Oil kg/hr	Water/Oil lb/hr/unit
Valves	4.5E-03	9.92E-03	**2.5E-03**	**5.51E-03**	9.8E-05	2.16E-04
Pump Seals	2.4E-03	5.29E-03	**1.3E-02**	**2.87E-02**	2.4E-05	5.29E-05
Others	8.8E-03	1.94E-02	**7.5E-03**	**1.65E-02**	1.4E-02	3.09E-02
Connectors	2.0E-04	4.41E-04	**2.1E-04**	**4.63E-04**	1.1E-04	2.43E-04
Flanges	3.9E-04	8.60E-04	**1.1E-04**	**2.43E-04**	2.9E-06	6.39E-06
Open-Ended Lines	2.0E-03	4.41E-03	**1.4E-03**	**3.09E-03**	2.5E-04	5.51E-04

3 - "Other" components include pressure relief devices (PRD), diaphragms, drains, meters, etc.

4 - Component counts based on engineering judgment.

5 - The results of a representative **Stabilized Condensate Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Data):

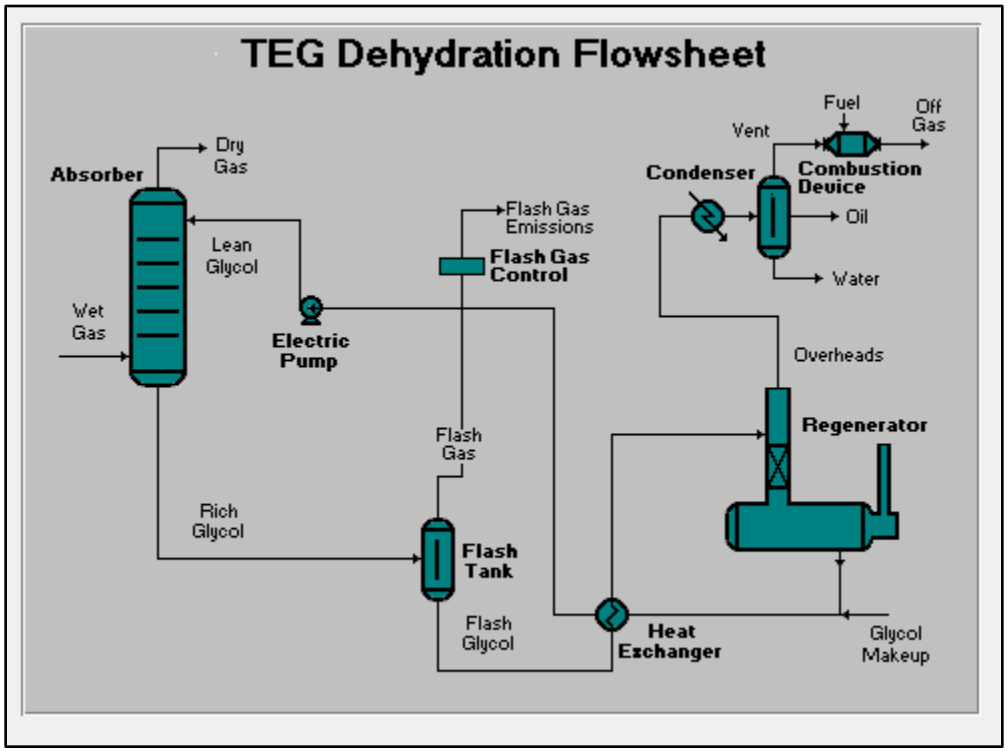
		Minimum Contingency:	15%	
Pollutant	**Condensate**	**Worst Case**	**%Total**	**%VOC**
CO2	--- lb/MMscf	--- lb/MMscf	---	**---**
Methane (CH4)	--- lb/MMscf	--- lb/MMscf	---	**---**
N2/Water/Ethane/Etc	0.05 lb/MMscf	--- lb/MMscf	---	**---**
VOC	267,979 lb/MMscf	308,200 lb/MMscf	100.00	**100.00**
TOTAL Gas	267,979 lb/MMscf	308,200 lb/MMscf	100.00	**---**
Benzene	126.46 lb/MMscf	150.00 lb/MMscf	0.05	**0.049**
Ethylbenzene	3,354 lb/MMscf	3,875 lb/MMscf	1.26	**1.257**
n-Hexane	12,409 lb/MMscf	14,275 lb/MMscf	4.63	**4.632**
Methanol	84.35 lb/MMscf	100.00 lb/MMscf	0.03	**0.032**
Toluene	1,686 lb/MMscf	1,950 lb/MMscf	0.63	**0.633**
2,2,4-TMP	1,131 lb/MMscf	1,325 lb/MMscf	0.43	**0.430**
Xylenes	4,391 lb/MMscf	5,050 lb/MMscf	1.64	**1.639**
Total HAP	23,181 lb/MMscf	26,725 lb/MMscf	8.67	**8.671**

6 - LDAR Control Credit from EPA document "Leak Detection and Repair Compliance Assistance Guidance — A Best Practices Guide" Table 4-1, 500 ppm Leak Definition (i.e., NSPS OOOOa monitoring).

Supplement S6

Emission Program Data

- **EPA Tanks 4.0.9d – Condensate Storage Tanks (TK-01 thru TK-10)**
- **EPA Tanks 4.0.9d – Produced Fluid/Water Storage Tanks (WTK-11 and WTK-12)**
- **GRI-GLYCalc – Dehydrators (DFT-1/DSV-1 thru DFT-3/DSV-3)**



GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: 2023-AMS-Miller CS-NSR-Electric-55 MMscf-GLYCalc.101323
File Name: D:\Projects2\wfs\AMS\Miller\45CSR13#2\010-S3c-AMS-Miller CS-45CSR13 Mod-55 MMscf-GLYCalc-Electric-101323.ddf
Date: October 16, 2023

DESCRIPTION:

Description: 55 MMscfd: 80 oF, 1000 psig
15.0 gpm Electric Glycol Pump
Flash Tank: 80 oF, 60 psig, 98% Control
Condenser: 150 oF, 14 psia, 95% Control

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 80.00 deg. F
Pressure: 1000.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.1681
Nitrogen	0.2312
Methane	81.8333
Ethane	12.6132
Propane	3.4027
Isobutane	0.4471
n-Butane	0.7232
Isopentane	0.1934
n-Pentane	0.1615
n-Hexane	0.0461
Cyclohexane	0.0047
Other Hexanes	0.1081
Heptanes	0.0404
Methylcyclohexane	0.0091
2,2,4-Trimethylpentane	0.0008
Benzene	0.0010
Toluene	0.0010
Ethylbenzene	0.0001

Xylenes	0.0025
C8+ Heavies	0.0125

DRY GAS:

Flow Rate:	55.0 MMSCF/day
Water Content:	7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type:	TEG
Water Content:	1.5 wt% H2O
Flow Rate:	15.0 gpm

PUMP:

Glycol Pump Type:	Electric/Pneumatic

FLASH TANK:

Flash Control:	Combustion device
Flash Control Efficiency:	98.00 %
Temperature:	80.0 deg. F
Pressure:	60.0 psig

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device:	Condenser
Temperature:	150.0 deg. F
Pressure:	14.0 psia
Control Device:	Combustion Device
Destruction Efficiency:	95.0 %
Excess Oxygen:	5.0 %
Ambient Air Temperature:	80.0 deg. F

GRI-GLYCalc VERSION 4.0 - EMISSIONS SUMMARY

Case Name: 2023-AMS-Miller CS-NSR-Electric-55 MMscf-GLYCalc.101323
File Name: D:\Projects2\wfs\AMS\Miller\45CSR13#2\010-S3c-AMS-Miller CS-45CSR13 Mod-55 MMscf-GLYCalc-Electric-101323.ddf
Date: October 16, 2023

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0760	1.824	0.3329
Ethane	0.2341	5.618	1.0254
Propane	0.2433	5.839	1.0656
Isobutane	0.0747	1.793	0.3272
n-Butane	0.1825	4.380	0.7994
Isopentane	0.0616	1.479	0.2699
n-Pentane	0.0726	1.742	0.3179
n-Hexane	0.0435	1.044	0.1905
Cyclohexane	0.0228	0.548	0.1000
Other Hexanes	0.0747	1.792	0.3271
Heptanes	0.0798	1.914	0.3493
Methylcyclohexane	0.0504	1.210	0.2208
2,2,4-Trimethylpentane	0.0007	0.016	0.0029
Benzene	0.0410	0.984	0.1797
Toluene	0.0570	1.369	0.2499
Ethylbenzene	0.0064	0.154	0.0280
Xylenes	0.1928	4.628	0.8445
C8+ Heavies	0.0041	0.099	0.0181
Total Emissions	1.5181	36.433	6.6491
Total Hydrocarbon Emissions	1.5181	36.433	6.6491
Total VOC Emissions	1.2079	28.991	5.2908
Total HAP Emissions	0.3414	8.195	1.4955
Total BTEX Emissions	0.2973	7.135	1.3021

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	1.5205	36.493	6.6599

Ethane	4.6853	112.448	20.5218
Propane	4.8806	117.134	21.3770
Isobutane	1.5024	36.058	6.5805
n-Butane	3.6761	88.227	16.1015
Isopentane	1.2508	30.020	5.4787
n-Pentane	1.4799	35.517	6.4818
n-Hexane	0.9076	21.782	3.9752
Cyclohexane	0.4839	11.614	2.1196
Other Hexanes	1.5436	37.047	6.7611
Heptanes	1.7700	42.481	7.7527
Methylcyclohexane	1.1290	27.096	4.9450
2,2,4-Trimethylpentane	0.0148	0.355	0.0648
Benzene	0.8887	21.328	3.8923
Toluene	1.3945	33.468	6.1079
Ethylbenzene	0.1886	4.527	0.8262
Xylenes	6.1220	146.928	26.8144
C8+ Heavies	1.5289	36.694	6.6967
Total Emissions	34.9674	839.218	153.1573
Total Hydrocarbon Emissions	34.9674	839.218	153.1573
Total VOC Emissions	28.7616	690.277	125.9756
Total HAP Emissions	9.5162	228.389	41.6810
Total BTEX Emissions	8.5938	206.252	37.6409

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.4533	10.880	1.9857
Ethane	0.3257	7.817	1.4265
Propane	0.1441	3.458	0.6310
Isobutane	0.0257	0.617	0.1126
n-Butane	0.0453	1.088	0.1985
Isopentane	0.0122	0.293	0.0535
n-Pentane	0.0110	0.263	0.0481
n-Hexane	0.0032	0.078	0.0142
Cyclohexane	0.0004	0.010	0.0018
Other Hexanes	0.0076	0.183	0.0334
Heptanes	0.0026	0.063	0.0116
Methylcyclohexane	0.0007	0.016	0.0030
2,2,4-Trimethylpentane	<0.0001	0.001	0.0002
Benzene	0.0001	0.002	0.0004

Toluene	0.0001	0.002	0.0003
Ethylbenzene	<0.0001	<0.001	<0.0001
Xylenes	0.0001	0.003	0.0005
C8+ Heavies	0.0003	0.007	0.0013
Total Emissions	1.0326	24.781	4.5226
Total Hydrocarbon Emissions	1.0326	24.781	4.5226
Total VOC Emissions	0.2535	6.084	1.1104
Total HAP Emissions	0.0036	0.085	0.0156
Total BTEX Emissions	0.0003	0.007	0.0012

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	22.6673	544.015	99.2827
Ethane	16.2848	390.835	71.3273
Propane	7.2037	172.889	31.5522
Isobutane	1.2858	30.859	5.6318
n-Butane	2.2662	54.390	9.9262
Isopentane	0.6113	14.671	2.6775
n-Pentane	0.5486	13.167	2.4029
n-Hexane	0.1619	3.884	0.7089
Cyclohexane	0.0206	0.493	0.0900
Other Hexanes	0.3813	9.151	1.6700
Heptanes	0.1322	3.173	0.5791
Methylcyclohexane	0.0337	0.810	0.1478
2,2,4-Trimethylpentane	0.0024	0.057	0.0104
Benzene	0.0042	0.101	0.0184
Toluene	0.0037	0.089	0.0162
Ethylbenzene	0.0003	0.006	0.0011
Xylenes	0.0055	0.131	0.0239
C8+ Heavies	0.0144	0.346	0.0631
Total Emissions	51.6278	1239.066	226.1296
Total Hydrocarbon Emissions	51.6278	1239.066	226.1296
Total VOC Emissions	12.6757	304.217	55.5195
Total HAP Emissions	0.1778	4.268	0.7789
Total BTEX Emissions	0.0136	0.326	0.0596

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.5294	12.705	2.3186
Ethane	0.5598	13.435	2.4519
Propane	0.3874	9.297	1.6966
Isobutane	0.1004	2.410	0.4399
n-Butane	0.2278	5.468	0.9979
Isopentane	0.0738	1.772	0.3234
n-Pentane	0.0835	2.005	0.3659
n-Hexane	0.0467	1.121	0.2047
Cyclohexane	0.0232	0.558	0.1018
Other Hexanes	0.0823	1.975	0.3605
Heptanes	0.0824	1.978	0.3609
Methylcyclohexane	0.0511	1.226	0.2238
2,2,4-Trimethylpentane	0.0007	0.017	0.0031
Benzene	0.0411	0.986	0.1800
Toluene	0.0571	1.371	0.2502
Ethylbenzene	0.0064	0.154	0.0281
Xylenes	0.1929	4.630	0.8450
C8+ Heavies	0.0044	0.106	0.0194
Total Emissions	2.5506	61.215	11.1717
Total Hydrocarbon Emissions	2.5506	61.215	11.1717
Total VOC Emissions	1.4615	35.075	6.4012
Total HAP Emissions	0.3450	8.280	1.5111
Total BTEX Emissions	0.2976	7.141	1.3033

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: 2023-AMS-Miller CS-NSR-Electric-55 MMscf-GLYCalc.101323
File Name: D:\Projects2\wfs\AMS\Miller\45CSR13#2\010-S3c-AMS-Miller CS-45CSR13 Mod-55 MMscf-GLYCalc-Electric-101323.ddf
Date: October 16, 2023

DESCRIPTION:

Description: 55 MMscfd: 80 oF, 1000 psig
15.0 gpm Electric Glycol Pump
Flash Tank: 80 oF, 60 psig, 98% Control
Condenser: 150 oF, 14 psia, 95% Control

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0760	1.824	0.3329
Ethane	0.2341	5.618	1.0254
Propane	0.2433	5.839	1.0656
Isobutane	0.0747	1.793	0.3272
n-Butane	0.1825	4.380	0.7994
Isopentane	0.0616	1.479	0.2699
n-Pentane	0.0726	1.742	0.3179
n-Hexane	0.0435	1.044	0.1905
Cyclohexane	0.0228	0.548	0.1000
Other Hexanes	0.0747	1.792	0.3271
Heptanes	0.0798	1.914	0.3493
Methylcyclohexane	0.0504	1.210	0.2208
2,2,4-Trimethylpentane	0.0007	0.016	0.0029
Benzene	0.0410	0.984	0.1797
Toluene	0.0570	1.369	0.2499
Ethylbenzene	0.0064	0.154	0.0280
Xylenes	0.1928	4.628	0.8445
C8+ Heavies	0.0041	0.099	0.0181

Total Emissions	1.5181	36.433	6.6491
Total Hydrocarbon Emissions	1.5181	36.433	6.6491
Total VOC Emissions	1.2079	28.991	5.2908
Total HAP Emissions	0.3414	8.195	1.4955
Total BTEX Emissions	0.2973	7.135	1.3021

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	1.5205	36.493	6.6599
Ethane	4.6853	112.448	20.5218
Propane	4.8806	117.134	21.3770
Isobutane	1.5024	36.058	6.5805
n-Butane	3.6761	88.227	16.1015
Isopentane	1.2508	30.020	5.4787
n-Pentane	1.4799	35.517	6.4818
n-Hexane	0.9076	21.782	3.9752
Cyclohexane	0.4839	11.614	2.1196
Other Hexanes	1.5436	37.047	6.7611
Heptanes	1.7700	42.481	7.7527
Methylcyclohexane	1.1290	27.096	4.9450
2,2,4-Trimethylpentane	0.0148	0.355	0.0648
Benzene	0.8887	21.328	3.8923
Toluene	1.3945	33.468	6.1079
Ethylbenzene	0.1886	4.527	0.8262
Xylenes	6.1220	146.928	26.8144
C8+ Heavies	1.5289	36.694	6.6967
Total Emissions	34.9674	839.218	153.1573
Total Hydrocarbon Emissions	34.9674	839.218	153.1573
Total VOC Emissions	28.7616	690.277	125.9756
Total HAP Emissions	9.5162	228.389	41.6810
Total BTEX Emissions	8.5938	206.252	37.6409

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.4533	10.880	1.9857

Ethane	0.3257	7.817	1.4265
Propane	0.1441	3.458	0.6310
Isobutane	0.0257	0.617	0.1126
n-Butane	0.0453	1.088	0.1985
Isopentane	0.0122	0.293	0.0535
n-Pentane	0.0110	0.263	0.0481
n-Hexane	0.0032	0.078	0.0142
Cyclohexane	0.0004	0.010	0.0018
Other Hexanes	0.0076	0.183	0.0334
Heptanes	0.0026	0.063	0.0116
Methylcyclohexane	0.0007	0.016	0.0030
2,2,4-Trimethylpentane	<0.0001	0.001	0.0002
Benzene	0.0001	0.002	0.0004
Toluene	0.0001	0.002	0.0003
Ethylbenzene	<0.0001	<0.001	<0.0001
Xylenes	0.0001	0.003	0.0005
C8+ Heavies	0.0003	0.007	0.0013
Total Emissions	1.0326	24.781	4.5226
Total Hydrocarbon Emissions	1.0326	24.781	4.5226
Total VOC Emissions	0.2535	6.084	1.1104
Total HAP Emissions	0.0036	0.085	0.0156
Total BTEX Emissions	0.0003	0.007	0.0012

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	22.6673	544.015	99.2827
Ethane	16.2848	390.835	71.3273
Propane	7.2037	172.889	31.5522
Isobutane	1.2858	30.859	5.6318
n-Butane	2.2662	54.390	9.9262
Isopentane	0.6113	14.671	2.6775
n-Pentane	0.5486	13.167	2.4029
n-Hexane	0.1619	3.884	0.7089
Cyclohexane	0.0206	0.493	0.0900
Other Hexanes	0.3813	9.151	1.6700
Heptanes	0.1322	3.173	0.5791
Methylcyclohexane	0.0337	0.810	0.1478
2,2,4-Trimethylpentane	0.0024	0.057	0.0104
Benzene	0.0042	0.101	0.0184

Toluene	0.0037	0.089	0.0162
Ethylbenzene	0.0003	0.006	0.0011
Xylenes	0.0055	0.131	0.0239
C8+ Heavies	0.0144	0.346	0.0631
Total Emissions	51.6278	1239.066	226.1296
Total Hydrocarbon Emissions	51.6278	1239.066	226.1296
Total VOC Emissions	12.6757	304.217	55.5195
Total HAP Emissions	0.1778	4.268	0.7789
Total BTEX Emissions	0.0136	0.326	0.0596

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.5294	12.705	2.3186
Ethane	0.5598	13.435	2.4519
Propane	0.3874	9.297	1.6966
Isobutane	0.1004	2.410	0.4399
n-Butane	0.2278	5.468	0.9979
Isopentane	0.0738	1.772	0.3234
n-Pentane	0.0835	2.005	0.3659
n-Hexane	0.0467	1.121	0.2047
Cyclohexane	0.0232	0.558	0.1018
Other Hexanes	0.0823	1.975	0.3605
Heptanes	0.0824	1.978	0.3609
Methylcyclohexane	0.0511	1.226	0.2238
2,2,4-Trimethylpentane	0.0007	0.017	0.0031
Benzene	0.0411	0.986	0.1800
Toluene	0.0571	1.371	0.2502
Ethylbenzene	0.0064	0.154	0.0281
Xylenes	0.1929	4.630	0.8450
C8+ Heavies	0.0044	0.106	0.0194
Total Emissions	2.5506	61.215	11.1717
Total Hydrocarbon Emissions	2.5506	61.215	11.1717
Total VOC Emissions	1.4615	35.075	6.4012
Total HAP Emissions	0.3450	8.280	1.5111
Total BTEX Emissions	0.2976	7.141	1.3033

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction
Methane	105.9427	2.3186	97.81
Ethane	91.8491	2.4519	97.33
Propane	52.9292	1.6966	96.79
Isobutane	12.2123	0.4399	96.40
n-Butane	26.0276	0.9979	96.17
Isopentane	8.1561	0.3234	96.03
n-Pentane	8.8848	0.3659	95.88
n-Hexane	4.6842	0.2047	95.63
Cyclohexane	2.2097	0.1018	95.39
Other Hexanes	8.4311	0.3605	95.72
Heptanes	8.3318	0.3609	95.67
Methylcyclohexane	5.0928	0.2238	95.61
2,2,4-Trimethylpentane	0.0752	0.0031	95.83
Benzene	3.9108	0.1800	95.40
Toluene	6.1241	0.2502	95.91
Ethylbenzene	0.8273	0.0281	96.61
Xylenes	26.8383	0.8450	96.85
C8+ Heavies	6.7598	0.0194	99.71
Total Emissions	379.2869	11.1717	97.05
Total Hydrocarbon Emissions	379.2869	11.1717	97.05
Total VOC Emissions	181.4951	6.4012	96.47
Total HAP Emissions	42.4599	1.5111	96.44
Total BTEX Emissions	37.7005	1.3033	96.54

EQUIPMENT REPORTS:

CONDENSER AND COMBUSTION DEVICE

Condenser Outlet Temperature: 150.00 deg. F
Condenser Pressure: 14.00 psia
Condenser Duty: 1.24e-001 MM BTU/hr

Hydrocarbon Recovery:	0.37 bbls/day
Produced Water:	4.61 bbls/day
Ambient Temperature:	80.00 deg. F
Excess Oxygen:	5.00 %
Combustion Efficiency:	95.00 %
Supplemental Fuel Requirement:	1.24e-001 MM BTU/hr

Component	Emitted	Destroyed
Methane	5.00%	95.00%
Ethane	5.00%	95.00%
Propane	4.98%	95.02%
Isobutane	4.97%	95.03%
n-Butane	4.96%	95.04%
Isopentane	4.93%	95.07%
n-Pentane	4.90%	95.10%
n-Hexane	4.79%	95.21%
Cyclohexane	4.72%	95.28%
Other Hexanes	4.84%	95.16%
Heptanes	4.51%	95.49%
Methylcyclohexane	4.47%	95.53%
2,2,4-Trimethylpentane	4.52%	95.48%
Benzene	4.62%	95.38%
Toluene	4.09%	95.91%
Ethylbenzene	3.39%	96.61%
Xylenes	3.15%	96.85%
C8+ Heavies	0.27%	99.73%

ABSORBER

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

Calculated Absorber Stages:	1.25
Calculated Dry Gas Dew Point:	1.22 lbs. H2O/MMSCF
Temperature:	80.0 deg. F
Pressure:	1000.0 psig
Dry Gas Flow Rate:	55.0000 MMSCF/day
Glycol Losses with Dry Gas:	0.5543 lb/hr
Wet Gas Water Content:	Saturated
Calculated Wet Gas Water Content:	32.32 lbs. H2O/MMSCF

Calculated Lean Glycol Recirc. Ratio: 12.62 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.77%	96.23%
Carbon Dioxide	99.56%	0.44%
Nitrogen	99.96%	0.04%
Methane	99.97%	0.03%
Ethane	99.91%	0.09%
Propane	99.87%	0.13%
Isobutane	99.82%	0.18%
n-Butane	99.77%	0.23%
Isopentane	99.78%	0.22%
n-Pentane	99.71%	0.29%
n-Hexane	99.55%	0.45%
Cyclohexane	97.89%	2.11%
Other Hexanes	99.66%	0.34%
Heptanes	99.22%	0.78%
Methylcyclohexane	97.85%	2.15%
2,2,4-Trimethylpentane	99.69%	0.31%
Benzene	81.08%	18.92%
Toluene	74.89%	25.11%
Ethylbenzene	70.58%	29.42%
Xylenes	61.85%	38.15%
C8+ Heavies	98.80%	1.20%

FLASH TANK

Flash Control: Combustion device
Flash Control Efficiency: 98.00 %
Flash Temperature: 80.0 deg. F
Flash Pressure: 60.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.99%	0.01%
Carbon Dioxide	53.57%	46.43%
Nitrogen	6.15%	93.85%
Methane	6.29%	93.71%
Ethane	22.34%	77.66%

Propane	40.39%	59.61%
Isobutane	53.88%	46.12%
n-Butane	61.86%	38.14%
Isopentane	67.34%	32.66%
n-Pentane	73.09%	26.91%
n-Hexane	84.94%	15.06%
Cyclohexane	96.06%	3.94%
Other Hexanes	80.39%	19.61%
Heptanes	93.08%	6.92%
Methylcyclohexane	97.21%	2.79%
2,2,4-Trimethylpentane	86.35%	13.65%
Benzene	99.55%	0.45%
Toluene	99.76%	0.24%
Ethylbenzene	99.88%	0.12%
Xylenes	99.92%	0.08%
C8+ Heavies	99.18%	0.82%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	63.97%	36.03%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.74%	99.26%
n-Pentane	0.68%	99.32%
n-Hexane	0.59%	99.41%
Cyclohexane	3.33%	96.67%
Other Hexanes	1.24%	98.76%
Heptanes	0.54%	99.46%
Methylcyclohexane	4.12%	95.88%
2,2,4-Trimethylpentane	1.74%	98.26%
Benzene	5.02%	94.98%

Toluene	7.89%	92.11%
Ethylbenzene	10.35%	89.65%
Xylenes	12.80%	87.20%
C8+ Heavies	12.01%	87.99%

STREAM REPORTS:

WET GAS STREAM

Temperature: 80.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 2.29e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.81e-002	7.42e+001
Carbon Dioxide	1.68e-001	4.47e+002
Nitrogen	2.31e-001	3.91e+002
Methane	8.18e+001	7.93e+004
Ethane	1.26e+001	2.29e+004
Propane	3.40e+000	9.07e+003
Isobutane	4.47e-001	1.57e+003
n-Butane	7.23e-001	2.54e+003
Isopentane	1.93e-001	8.43e+002
n-Pentane	1.61e-001	7.04e+002
n-Hexane	4.61e-002	2.40e+002
Cyclohexane	4.70e-003	2.39e+001
Other Hexanes	1.08e-001	5.63e+002
Heptanes	4.04e-002	2.45e+002
Methylcyclohexane	9.09e-003	5.40e+001
2,2,4-Trimethylpentane	7.99e-004	5.52e+000
Benzene	9.99e-004	4.72e+000
Toluene	9.99e-004	5.57e+000
Ethylbenzene	9.99e-005	6.42e-001
Xylenes	2.50e-003	1.60e+001
C8+ Heavies	1.25e-002	1.29e+002
Total Components	100.00	1.19e+005

DRY GAS STREAM

Temperature: 80.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 2.29e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.57e-003	2.79e+000
Carbon Dioxide	1.67e-001	4.45e+002
Nitrogen	2.31e-001	3.91e+002
Methane	8.18e+001	7.93e+004
Ethane	1.26e+001	2.29e+004
Propane	3.40e+000	9.06e+003
Isobutane	4.47e-001	1.57e+003
n-Butane	7.22e-001	2.53e+003
Isopentane	1.93e-001	8.41e+002
n-Pentane	1.61e-001	7.02e+002
n-Hexane	4.59e-002	2.39e+002
Cyclohexane	4.60e-003	2.34e+001
Other Hexanes	1.08e-001	5.61e+002
Heptanes	4.01e-002	2.43e+002
Methylcyclohexane	8.91e-003	5.28e+001
2,2,4-Trimethylpentane	7.98e-004	5.50e+000
Benzene	8.11e-004	3.83e+000
Toluene	7.49e-004	4.17e+000
Ethylbenzene	7.06e-005	4.53e-001
Xylenes	1.55e-003	9.92e+000
C8+ Heavies	1.24e-002	1.27e+002
Total Components	100.00	1.19e+005

LEAN GLYCOL STREAM

Temperature: 80.00 deg. F
Flow Rate: 1.50e+001 gpm

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

TEG	9.85e+001	8.32e+003
Water	1.50e+000	1.27e+002
Carbon Dioxide	2.35e-012	1.98e-010
Nitrogen	1.68e-013	1.42e-011
Methane	9.62e-018	8.12e-016
Ethane	1.17e-007	9.89e-006
Propane	5.82e-009	4.92e-007
Isobutane	9.90e-010	8.36e-008
n-Butane	1.74e-009	1.47e-007
Isopentane	1.11e-004	9.36e-003
n-Pentane	1.21e-004	1.02e-002
n-Hexane	6.36e-005	5.37e-003
Cyclohexane	1.98e-004	1.67e-002
Other Hexanes	2.30e-004	1.94e-002
Heptanes	1.13e-004	9.56e-003
Methylcyclohexane	5.74e-004	4.85e-002
2,2,4-Trimethylpentane	3.10e-006	2.62e-004
Benzene	5.56e-004	4.69e-002
Toluene	1.42e-003	1.19e-001
Ethylbenzene	2.58e-004	2.18e-002
Xylenes	1.06e-002	8.98e-001
C8+ Heavies	2.47e-003	2.09e-001
Total Components	100.00	8.44e+003

RICH GLYCOL STREAM

Temperature: 80.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 1.53e+001 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.67e+001	8.31e+003
Water	2.30e+000	1.98e+002
Carbon Dioxide	2.30e-002	1.98e+000
Nitrogen	1.66e-003	1.43e-001
Methane	2.81e-001	2.42e+001
Ethane	2.44e-001	2.10e+001
Propane	1.40e-001	1.21e+001
Isobutane	3.24e-002	2.79e+000

n-Butane	6.91e-002	5.94e+000
Isopentane	2.18e-002	1.87e+000
n-Pentane	2.37e-002	2.04e+000
n-Hexane	1.25e-002	1.07e+000
Cyclohexane	6.06e-003	5.21e-001
Other Hexanes	2.26e-002	1.94e+000
Heptanes	2.22e-002	1.91e+000
Methylcyclohexane	1.41e-002	1.21e+000
2,2,4-Trimethylpentane	2.03e-004	1.74e-002
Benzene	1.09e-002	9.40e-001
Toluene	1.76e-002	1.52e+000
Ethylbenzene	2.45e-003	2.11e-001
Xylenes	8.17e-002	7.03e+000
C8+ Heavies	2.04e-002	1.75e+000
Total Components	100.00	8.60e+003

FLASH TANK OFF GAS STREAM

Temperature: 80.00 deg. F
Pressure: 74.70 psia
Flow Rate: 8.46e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.42e-002	1.37e-002
Carbon Dioxide	9.37e-001	9.20e-001
Nitrogen	2.14e-001	1.34e-001
Methane	6.34e+001	2.27e+001
Ethane	2.43e+001	1.63e+001
Propane	7.32e+000	7.20e+000
Isobutane	9.92e-001	1.29e+000
n-Butane	1.75e+000	2.27e+000
Isopentane	3.80e-001	6.11e-001
n-Pentane	3.41e-001	5.49e-001
n-Hexane	8.42e-002	1.62e-001
Cyclohexane	1.10e-002	2.06e-002
Other Hexanes	1.98e-001	3.81e-001
Heptanes	5.92e-002	1.32e-001
Methylcyclohexane	1.54e-002	3.37e-002
2,2,4-Trimethylpentane	9.34e-004	2.38e-003

Benzene	2.42e-003	4.21e-003
Toluene	1.80e-003	3.69e-003
Ethylbenzene	1.07e-004	2.52e-004
Xylenes	2.30e-003	5.45e-003
C8+ Heavies	3.79e-003	1.44e-002
Total Components	100.00	5.27e+001

FLASH TANK GLYCOL STREAM

Temperature: 80.00 deg. F
Flow Rate: 1.52e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.72e+001	8.31e+003
Water	2.32e+000	1.98e+002
Carbon Dioxide	1.24e-002	1.06e+000
Nitrogen	1.03e-004	8.77e-003
Methane	1.78e-002	1.52e+000
Ethane	5.48e-002	4.69e+000
Propane	5.71e-002	4.88e+000
Isobutane	1.76e-002	1.50e+000
n-Butane	4.30e-002	3.68e+000
Isopentane	1.47e-002	1.26e+000
n-Pentane	1.74e-002	1.49e+000
n-Hexane	1.07e-002	9.13e-001
Cyclohexane	5.85e-003	5.01e-001
Other Hexanes	1.83e-002	1.56e+000
Heptanes	2.08e-002	1.78e+000
Methylcyclohexane	1.38e-002	1.18e+000
2,2,4-Trimethylpentane	1.76e-004	1.51e-002
Benzene	1.09e-002	9.36e-001
Toluene	1.77e-002	1.51e+000
Ethylbenzene	2.46e-003	2.10e-001
Xylenes	8.21e-002	7.02e+000
C8+ Heavies	2.03e-002	1.74e+000
Total Components	100.00	8.55e+003

FLASH GAS EMISSIONS

Flow Rate: 3.35e+003 scfh
Control Method: Combustion Device
Control Efficiency: 98.00

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.18e+001	9.83e+001
Carbon Dioxide	3.76e+001	1.46e+002
Nitrogen	5.41e-002	1.34e-001
Methane	3.20e-001	4.53e-001
Ethane	1.23e-001	3.26e-001
Propane	3.70e-002	1.44e-001
Isobutane	5.01e-003	2.57e-002
n-Butane	8.84e-003	4.53e-002
Isopentane	1.92e-003	1.22e-002
n-Pentane	1.72e-003	1.10e-002
n-Hexane	4.26e-004	3.24e-003
Cyclohexane	5.54e-005	4.11e-004
Other Hexanes	1.00e-003	7.63e-003
Heptanes	2.99e-004	2.64e-003
Methylcyclohexane	7.79e-005	6.75e-004
2,2,4-Trimethylpentane	4.72e-006	4.76e-005
Benzene	1.22e-005	8.42e-005
Toluene	9.08e-006	7.38e-005
Ethylbenzene	5.39e-007	5.05e-006
Xylenes	1.16e-005	1.09e-004
C8+ Heavies	1.92e-005	2.88e-004
Total Components	100.00	2.45e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.76e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	8.55e+001	7.14e+001
Carbon Dioxide	5.21e-001	1.06e+000

Nitrogen	6.76e-003	8.77e-003
Methane	2.05e+000	1.52e+000
Ethane	3.36e+000	4.69e+000
Propane	2.39e+000	4.88e+000
Isobutane	5.58e-001	1.50e+000
n-Butane	1.37e+000	3.68e+000
Isopentane	3.74e-001	1.25e+000
n-Pentane	4.43e-001	1.48e+000
n-Hexane	2.27e-001	9.08e-001
Cyclohexane	1.24e-001	4.84e-001
Other Hexanes	3.87e-001	1.54e+000
Heptanes	3.81e-001	1.77e+000
Methylcyclohexane	2.48e-001	1.13e+000
2,2,4-Trimethylpentane	2.80e-003	1.48e-002
Benzene	2.46e-001	8.89e-001
Toluene	3.27e-001	1.39e+000
Ethylbenzene	3.84e-002	1.89e-001
Xylenes	1.24e+000	6.12e+000
C8+ Heavies	1.94e-001	1.53e+000
Total Components	100.00	1.07e+002

CONDENSER PRODUCED WATER STREAM

Temperature: 150.00 deg. F
Flow Rate: 1.34e-001 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	1.00e+002	6.72e+001	999676.
Carbon Dioxide	1.80e-003	1.21e-003	18.
Nitrogen	4.74e-007	3.19e-007	0.
Methane	1.48e-004	9.94e-005	1.
Ethane	4.90e-004	3.30e-004	5.
Propane	6.20e-004	4.17e-004	6.
Isobutane	1.00e-004	6.75e-005	1.
n-Butane	3.15e-004	2.12e-004	3.
Isopentane	7.18e-005	4.83e-005	1.
n-Pentane	8.93e-005	6.00e-005	1.
n-Hexane	4.19e-005	2.82e-005	0.
Cyclohexane	1.13e-004	7.60e-005	1.

Other Hexanes	5.92e-005	3.98e-005	1.
Heptanes	4.11e-005	2.76e-005	0.
Methylcyclohexane	1.16e-004	7.82e-005	1.
2,2,4-Trimethylpentane	2.35e-007	1.58e-007	0.
Benzene	4.96e-003	3.33e-003	50.
Toluene	5.39e-003	3.62e-003	54.
Ethylbenzene	4.37e-004	2.94e-004	4.
Xylenes	1.76e-002	1.19e-002	176.
C8+ Heavies	8.38e-007	5.64e-007	0.
Total Components	100.00	6.72e+001	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 150.00 deg. F
Flow Rate: 1.08e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	4.69e-002	2.15e-003
Carbon Dioxide	7.80e-003	3.58e-004
Nitrogen	2.46e-005	1.13e-006
Methane	4.60e-003	2.11e-004
Ethane	6.48e-002	2.97e-003
Propane	3.16e-001	1.45e-002
Isobutane	1.78e-001	8.18e-003
n-Butane	5.62e-001	2.58e-002
Isopentane	4.02e-001	1.84e-002
n-Pentane	6.20e-001	2.84e-002
n-Hexane	8.23e-001	3.78e-002
Cyclohexane	5.94e-001	2.72e-002
Other Hexanes	1.09e+000	5.00e-002
Heptanes	3.81e+000	1.75e-001
Methylcyclohexane	2.63e+000	1.21e-001
2,2,4-Trimethylpentane	3.12e-002	1.43e-003
Benzene	1.42e+000	6.50e-002
Toluene	5.45e+000	2.50e-001
Ethylbenzene	1.31e+000	6.03e-002
Xylenes	4.91e+001	2.25e+000
C8+ Heavies	3.15e+001	1.45e+000

Total Components	100.00	4.59e+000

CONDENSER VENT STREAM

Temperature: 150.00 deg. F
Pressure: 14.00 psia
Flow Rate: 3.26e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.67e+001	4.13e+000
Carbon Dioxide	2.80e+000	1.06e+000
Nitrogen	3.64e-002	8.76e-003
Methane	1.10e+001	1.52e+000
Ethane	1.81e+001	4.68e+000
Propane	1.28e+001	4.87e+000
Isobutane	2.99e+000	1.49e+000
n-Butane	7.30e+000	3.65e+000
Isopentane	1.99e+000	1.23e+000
n-Pentane	2.34e+000	1.45e+000
n-Hexane	1.17e+000	8.70e-001
Cyclohexane	6.31e-001	4.57e-001
Other Hexanes	2.01e+000	1.49e+000
Heptanes	1.85e+000	1.60e+000
Methylcyclohexane	1.19e+000	1.01e+000
2,2,4-Trimethylpentane	1.36e-002	1.34e-002
Benzene	1.22e+000	8.20e-001
Toluene	1.44e+000	1.14e+000
Ethylbenzene	1.40e-001	1.28e-001
Xylenes	4.22e+000	3.86e+000
C8+ Heavies	5.65e-002	8.27e-002
Total Components	100.00	3.56e+001

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.15e+001 scfh

Component	Conc.	Loading

	(vol%)	(lb/hr)
Methane	1.56e+001	7.60e-002
Ethane	2.57e+001	2.34e-001
Propane	1.82e+001	2.43e-001
Isobutane	4.24e+000	7.47e-002
n-Butane	1.04e+001	1.83e-001
Isopentane	2.82e+000	6.16e-002
n-Pentane	3.32e+000	7.26e-002
n-Hexane	1.66e+000	4.35e-002
Cyclohexane	8.94e-001	2.28e-002
Other Hexanes	2.86e+000	7.47e-002
Heptanes	2.62e+000	7.98e-002
Methylcyclohexane	1.69e+000	5.04e-002
2,2,4-Trimethylpentane	1.93e-002	6.68e-004
Benzene	1.73e+000	4.10e-002
Toluene	2.04e+000	5.70e-002
Ethylbenzene	1.99e-001	6.40e-003
Xylenes	5.99e+000	1.93e-001
C8+ Heavies	8.01e-002	4.14e-003
Total Components	100.00	1.52e+000

Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Permit - Request for Information; Application No. R30-05100130-2024

Steeber, Jeff <Jeff.Steeber@williams.com> Wed, Apr 24, 2024 at 4:39 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

I've been in the field this week but will work on getting these answers and requests over as soon as possible.

Thank you,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Monday, April 22, 2024 11:04 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-05100130-2024

[Quoted text hidden]

Barron, Sarah K <sarah.k.barron@wv.gov>

Title V Permit - Request for Information; Application No. R30-05100130-2024

Barron, Sarah K <sarah.k.barron@wv.gov> Mon, Apr 22, 2024 at 11:04 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Hi, Jeff.

I have a few questions about the application for the Miller Compressor Station's initial Title V operating permit.

1) I noticed that the Title V permit application was submitted before the issuance of the current NSR permit (R13-2831G). Could you please update and resubmit any of the forms from the Title V application that need to be revised to account for changes made with R13-2831G? (such as Attachment D: Equipment Table, Attachment E: Emission Unit Form for the flash tanks and still vents of the dehydration units, and PTE Calculations)

2) Could you send the Attachment G: Control Device Form for the dehydrator/stabilizer flare which was not included in the Title V application?

3) The flare is subject to the particulate matter emissions limit of 45CSR§6-4.1. Please send me the maximum incinerator capacity (lbs/hr) of the flare so that this limit can be calculated and included in the operating permit.

4) The NSPS for facilities in the oil and natural gas source category have been amended. Certain provisions of Subparts OOOO and OOOOa have been changed, and Subpart OOOOb has been added. Subpart OOOOb is applicable to affected facilities in the natural gas source category that commence construction, modification, or reconstruction after December 6, 2022.

- Since construction of the engines EUCE-2a and EUCE-4a began after the applicability date, do you agree that the compressors associated with these engines are subject to Subpart OOOOb, rather than Subpart OOOOa?
- For the purpose of the requirements for the collection of fugitive emissions components at a compressor station, a modification occurs when one or more compressors is replaced by one or more compressors of greater total horsepower, in accordance with 40 C.F.R. §60.5365b(i)(3)(ii). The two 1,900-HP engines (EUCE-2a and -4a) replaced two 1,300-HP engines (EUCE-2 and -4) following the applicability date of Subpart OOOOb. Do you agree that the Miller Compressor Station is subject to the requirements for fugitive emission components under Subpart OOOOb?
- The applicability requirements for some affected facilities under Subpart OOOOb (40 C.F.R. §60.5365b) are different from the applicability requirements for Subparts OOOO and OOOOa. Could you explain if Subpart OOOOb applies to any other equipment at the facility?

Please, let me know if you have any questions or would like to discuss any of these topics further.

Thanks,
- Sarah

--
Sarah Barron
Engineer Trainee
West Virginia Department of Environmental Protection
Division of Air Quality
(304) 414-1915
sarah.k.barron@wv.gov

Barron, Sarah K <sarah.k.barron@wv.gov>

Completeness Determination, Miller Compressor Station, Application No. R30-05100130-2024

3 messages

Barron, Sarah K <sarah.k.barron@wv.gov> Tue, Dec 26, 2023 at 9:09 AM
To: t.j.rinke@williams.com, jeff.steeber@williams.com

Your Title V application for a permit to operate the above referenced facility was received by this Division on December 19, 2023. After review of said application, it has been determined that the application is administratively complete as submitted. Therefore, the above referenced facility qualifies for an Application Shield.

The applicant has the duty to supplement or correct the application. Any applicant who fails to submit any relevant facts or who has submitted incorrect information in a permit application shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary facts or corrected information. In addition, an applicant shall provide additional information as necessary to address any requirements that become applicable to the source after the date it filed a complete application but prior to release of a draft permit.

The submittal of a complete application shall not affect the requirement that any source have all **preconstruction permits** required under the rules of the Division.

If during the processing of this application it is determined that additional information is necessary to evaluate or take final action on this application, a request for such information will be made in writing with a reasonable deadline for a response. Until which time as your renewal permit is issued or denied, please continue to operate this facility in accordance with 45CSR30, section 6.3.c. which states: *If the Secretary fails to take final action to deny or approve a timely and complete permit application before the end of the term of the previous permit, the permit shall not expire until the renewal permit has been issued or denied, and any permit shield granted for the permit shall continue in effect during that time.* This protection shall cease to apply if, subsequent to the completeness determination made pursuant to paragraph 6.1.d. of 45CSR30 and as required by paragraph 4.1.b., the applicant fails to submit by the deadline specified in writing any additional information identified as being needed to process the application.

Please remember, **failure of the applicant to timely submit information required or requested to process the application may cause the Application Shield to be revoked.** Should you have any questions regarding this determination, please contact me.

Sincerely,

Sarah Barron

--
Sarah Barron
Technical Analyst Trainee
West Virginia Department of Environmental Protection
Division of Air Quality
(304) 926-0499 ext. 41915
sarah.k.barron@wv.gov

Steeber, Jeff <Jeff.Steeber@williams.com> Tue, Dec 26, 2023 at 12:14 PM
To: "sarah.k.barron@wv.gov" <sarah.k.barron@wv.gov>

Your message

To: Steeber, Jeff
Subject: [EXTERNAL] Completeness Determination, Miller Compressor Station, Application No. R30-05100130-2024
Sent: Tuesday, December 26, 2023 9:09:41 AM (UTC-05:00) Eastern Time (US & Canada)

was read on Tuesday, December 26, 2023 12:13:55 PM (UTC-05:00) Eastern Time (US & Canada).

Rinke, TJ <T.J.Rinke@williams.com> Tue, Jan 2, 2024 at 9:55 AM
To: "sarah.k.barron@wv.gov" <sarah.k.barron@wv.gov>

Your message

To: Rinke, TJ
Subject: [EXTERNAL] Completeness Determination, Miller Compressor Station, Application No. R30-05100130-2024
Sent: Tuesday, December 26, 2023 8:09:41 AM (UTC-06:00) Central Time (US & Canada)

was read on Tuesday, January 2, 2024 8:54:54 AM (UTC-06:00) Central Time (US & Canada).

Received
December 19, 2023
WV DEP/Div of Air Quality

Division of Air Quality Permit Application Submittal

Please find attached a permit application for:

Appalachia Midstream Services, LLC; Miller Compressor Station
[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): **051-00130**
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): **NSR: R13-2831F**

- Type of NSR Application (check all that apply):
  - ☐ Construction
  - ☐ Modification
  - ☐ Class I Administrative Update
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Application:
  - ☒ **Title V Initial**
  - ☐ Title V Renewal
  - ☐ Administrative Amendment**
  - ☐ Minor Modification**
  - ☐ Significant Modification**
  - ☐ Off Permit Change

**If the box above is checked, include the Title V revision information as ATTACHMENT S to the combined NSR/Title V application.

- Payment Type:
  - ☐ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)
    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☐ Responsible Official/Authorized Representative
    - Name:
    - Email:
    - Phone Number:
  - ☒ **Company Contact**
    - Name: **Jeff Steeber, Environmental Specialist**
    - Email: **Jeff.Steeber@Williams.com**
    - Phone Number: **(304) 843-3125**
  - ☐ Consultant
    - Name:
    - Email:
    - Phone Number:

Appalachia Midstream Services, LLC
100 Teletech Drive, Suite 2
Moundsville, WV 26041-2352

December 19, 2023

Via e-mail to: DEPAirQualityPermitting@wv.gov
Appalachia Midstream Services, LLC; Miller Compressor Station

Carrie McCumbers
Title V Permits Program Manager
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304-2345

Subject: **Application for 45CSR30 Title V Operating Permit**
Appalachia Midstream Services, LLC – Miller Compressor Station
Plant ID No. 051-00130
Marshall and Wetzel Counties, West Virginia

Dear Ms. McCumbers:

Appalachia Midstream Services, LLC is submitting an Application for a 45CSR30 Title V Operating Permit for the existing Miller Compressor Station located at 1779 Johnson Ridge, Bannen, in Marshall and Wetzel Counties, West Virginia.

If you have any questions concerning this submittal, or need additional information, please contact me by telephone at (304) 650-4741 or by e-mail at Jeff.Steeber@Williams.com.

Sincerely,

Jeff Steeber

Jeff Steeber
Environmental Specialist

Attachments:
Facility-Wide Potential to Emit (PTE)
Title V Operating Permit Application – Checklist

Enclosures:
Application for Title V Operating Permit
Attachments A thru H
Supplements S1 thru S6

Appalachia Midstream Services, LLC (AMS)

Miller Compressor Station

Application for 45CSR30 Title V Operating Permit

Facility-Wide Potential to Emit (PTE) [Tons per Year]

Unit ID	Point ID	Source ID	Description	NOX	CO	VOC (w/HCHO)	HCHO	TOTAL HAPs	TOTAL CO2e
Miller Compressor Station - Point Sources									
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	5.50	10.82	0.85	0.22	0.63	8,646
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	6.48	7.92	0.76	0.10	0.19	7,287
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	5.50	10.82	0.85	0.22	0.63	8,646
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	6.48	7.92	0.76	0.10	0.19	7,287
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	6.48	7.92	0.76	0.10	0.19	7,287
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	6.66	6.66	5.20	1.38	1.90	8,580
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	---	---	18.75	---	0.80	2,276
EUCRP	EPCRP	CRP	Compressor Rod Packing	---	---	21.81	---	0.93	2,647
EUESU	EPESU	ESU	Engine Start-up	---	---	6.57	---	0.28	797
EUECC	EPECC	ECC	Engine Crankcase	0.18	0.98	0.35	0.15	0.18	232
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	2.10	5.78	0.61	0.09	0.13	13,315
EUSTL-1	EPSTL-1	STL-01	Dehydrator 01 - Flash Tank and Still Vent	---	---	1.40	---	2E-01	61
EUSTL-2	EPSTL-2	STL-02	Dehydrator 02 - Flash Tank and Still Vent	---	---	1.40	---	0.17	61.12
EUSTL-3	EPSTL-3	STL-03	Dehydrator 03 - Flash Tank and Still Vent	---	---	1.40	---	0.17	61.12
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	0.43	0.36	0.02	0.00	0.01	512.89
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	0.43	0.36	0.02	0.00	0.01	512.89
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	0.43	0.36	0.02	3E-04	0.01	512.89
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	---	---	0.44	---	0.01	3.72
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	1.44	1.21	0.08	1E-03	0.03	1718.18
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	---	---	1.11	---	0.10	5.69
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	---	---	0.10	---	0.01	0.52
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	---	---	13.34	---	0.20	---
		WLOR	Truck Loading - Produced Fluid/Water (PW)	---	---	0.18	---	3E-04	---
EUPIG	EPPIG	PIG	Pigging Operations	---	---	0.63	---	0.03	76.03
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	2.15	6.79	0.12	0.00	0.04	2591.78
			Miller Compressor Station - Point Sources	**77.59**	**101.21**	**103.55**	**9.24**	**16.46**	**116,014**
Miller Compressor Station - Fugitives									
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	---	---	3.19	---	0.14	387
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	---	---	5.97	---	0.52	---
			Miller Compressor Station - Fugitives	**---**	**---**	**9.16**	**---**	**0.65**	**387**
Miller Compressor Station - Total									
			Miller Compressor Station - Total	**77.59**	**101.21**	**112.71**	**9.24**	**17.12**	**116,401**

Important Notes: Title V Operating Permit (TVOP) Applicability:

* Criteria pollutant fugitives are **not included** in TVOP major source determinations because the facility is not a listed source category.
* Hazardous air pollutant (HAP) fugitives are **always included** in TVOP major source determinations.
* Greenhouse gases (GHG) are **not included** in TVOP major source determinations.

1 - Emissions based on 100% of rated load for 8,760 hr/yr, including Compressor Blowdown (CBD), Truck Load-Out (TLO), Pigging Operations (PIG), and Flare-01 (FLR-01), each with intermittent operations.

2 - VOC is volatile organic compounds, as defined by EPA, includes HCHO (formaldehyde).

3 - HCHO is formaldehyde and is the individual HAP with the highest PTE.

4 - Total HAP is total hazardous air pollutants, including, but not limited to: acetaldehyde, acrolein, benzene, ethylbenzene, formaldehyde (HCHO), n-hexane, methanol (MeOH), toluene, 2,2,4-trimethylpentane (2,2,4-TMP or i-octane), and xylenes.

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

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.*

☑	A signed copy of the application ("Certification" page must be signed and dated by a Responsible Official as defined in 45CSR30)
☑	*Table of Contents (needs to be included but not for administrative completeness)
☑	Facility information
☑	Description of process and products, including NAICS and SIC codes, and including alternative operating scenarios
☑	Area map showing plant location
☑	Plot plan showing buildings and process areas
☑	Process flow diagram(s), showing all emission units, control equipment, emission points, and their relationships
☑	Identification of all applicable requirements with a description of the compliance status, the methods used for demonstrating compliance, 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)
☑	Facility-wide emissions summary
☑	Identification of Insignificant Activities
☑	ATTACHMENT D – Title V Equipment Table completed for all emission units at the facility except those designated as insignificant activities
☑	ATTACHMENT E – Emission Unit Form completed for each emission unit listed in the Title V Equipment Table (ATTACHMENT D) and a Schedule of Compliance Form (ATTACHMENT F) for all requirements for which the emission unit is not in compliance
☑	ATTACHMENT G – Air Pollution Control Device Form completed for each control device listed in the Title V Equipment Table (ATTACHMENT D)
☑	ATTACHMENT H – Compliance Assurance Monitoring (CAM) Plan Form 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
☐	Confidential Information submitted in accordance with 45CSR31

Application for
45CSR30 Title V Operating Permit

For the:

Appalachia Midstream Services, LLC

Miller Compressor Station

Plant ID No. 051-00130

Wetzel and Marshall County, West Virginia

Submitted to:

West Virginia
Department of Environmental Protection
Division of Air Quality

Submitted by:

Appalachia Midstream Services, LLC
100 Teletech Drive, Suite 2
Moundsville, WV 26041-2352

Prepared by:

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

November 2023

Application for
45CSR30 Title V Operating Permit

Appalachia Midstream Services, LLC
Miller Compressor Station
Plant ID No. 051-00130
Wetzel and Marshall County, West Virginia

Table of Contents

Application for
45CSR30 Title V Operating Permit

- **Section 1. General Information**
- **Section 2. Applicable Requirements**
- **Section 3. Facility-Wide Emissions**
- **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

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):	2. Facility Name or Location:
Appalachia Midstream Services, LLC	**Miller Compressor Station**
3. DAQ Plant ID No.:	**4. Federal Employer ID No. (FEIN):**
0 5 1 - 0 0 1 3 0	**2 6 - 3 6 7 8 9 7 2**

5. Permit Application Type:

☑ **Initial Permit** — When did operations commence? **2010**
☐ Permit Renewal — What is the expiration date of the existing permit? **na**
☐ Update to Initial/Renewal Permit Application

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.

8. Number of On-site Employees:

Less than ten (10)

na

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.

11. Mailing Address		
Street or P.O. Box:		
Appalachia Midstream Services, LLC 100 Teletech Drive, Suite 2		
City:	**State:**	**Zip:**
Moundsville	WV	26041
Telephone Number:	**Fax Number:**	
(304) 843-3125	na	

12. Facility Location					
Street:		**City:**		**County:**	
1779 Johnson Ridge		Dallas		Wetzel/Marshall	
UTM Easting:	532.49 km E	**UTM Northing:**	4,396.919 km N	**Zone:** ☑ 17	☐ 18

Directions:

From New Martinsville:

1) Head north on WV-2 (Energy Rd) ~4.6 mi;
2) Turn right onto Proctor Creek Rd ~9.3 mi;
3) Sharp left to stay on Proctor Creek Rd ~6.9 mi;
4) Turn left onto Johnson Ridge (CR-1/22) ~1.8 mi;
5) Take slight right to destination.

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/in 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 yes, name the area(s).**
If no, do emissions impact a Class I Area[1]?	☐ Yes	☑ **No**	na

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

13. Contact Information		
Responsible Official:	**Title:**	
T. J. Rinke	Vice President	
Street or P.O. Box:		
Appalachia Midstream Services, LLC One Williams Center		
City:	**State:**	**Zip:**
Tulsa	OK	74172-0140
Telephone Number:	**Cell Number:**	
(918) 573-9968	na	
E-mail address:		
T.J.Rinke@Williams.com		
Environmental Contact:	**Title:**	
Jeff Steeber	Environmental Specialist	
Street or P.O. Box:		
Appalachia Midstream Services, LLC 100 Teletech Drive, Suite 2		
City:	**State:**	**Zip:**
Moundsville	WV	26041-2790
Telephone Number:	**Cell Number:**	
(304) 843-3125	(304) 650-4741	
E-mail address:		
jeff.steeber@williams.com		
Application Preparer:	**Title:**	
Walter Konkel, III	Principal Scientist	
Company:		
EcoLogic Environmental Consultants, LLC		
Street or P.O. Box:		
864 Windsor Court		
City:	**State:**	**Zip:**
Santa Barbara	CA	93111-1037
Telephone Number:	**Cell Number:**	
(805) 964-7597	na	
E-mail address:		
wkonkel@elogicllc.com		

14. Facility Description

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

Process	Products	NAICS	SIC
Natural Gas Compression	**Compressed and Dehydrated Natural Gas, and Stabilized Condensate**	**213112***	**1389****
Natural Gas Dehydration			
Condensate Stabilization			

*** NAICS 213112: Support Activities for Oil and Gas Operations**

**** SIC 1389: Oil and Gas Field Services, Not Elsewhere Classified**

Provide a general description of operations

Appalachia Midstream Services, LLC (AMS) owns and operates the Miller Compressor Station located at 1779 Johnson Ridge (aka, Wetzel County Road 1/22), in Wetzel and Marshall Counties, West Virginia.

The facility receives low-pressure "wet" natural gas from local production wells via pipeline then compresses and dehydrates the gas for delivery of high pressure "dry" natural gas via pipeline. Additionally, raw condensate and produced fluid/water are stabilized (i.e., vapor pressure reduction), and then sent off-site via tanker trucks.

Please reference SUPPLEMENT 1 – Process Description

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.

18. Applicable Requirements Summary

Instructions: Mark all applicable requirements.

☐	SIP	☐	FIP
☑	**Minor Source NSR (45CSR13)**	☐	PSD (45CSR14)
☐	NESHAP (45CSR34)	☐	Nonattainment NSR (45CSR19)
☑	**Section 111 NSPS (JJJJ, OOOO and OOOOa)**	☑	**Section 112(d) MACT Standard (HH and ZZZZ)**
☐	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 (Odors)**	☐	Acid Rain (Title IV, 45CSR33)
☐	Emissions Trading and Banking (45CSR28)	☑	**Compliance Assurance Monitoring (40CFR64)**
☐	CAIR NOx Annual Trading Program (45CSR39)	☐	CAIR NOx Ozone Trading Program (45CSR40)
☐	CAIR SO2 Trading Program (45CSR41)		

Please reference Supplement S2 - Regulatory Discussion

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 S2 - Regulatory Discussion

☑ **Permit Shield**

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) .

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

☑ **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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

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)**

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)**
R13-2831F	**01/10/2023**	**na**

22. Inactive Permits/Obsolete Permit Conditions		
Permit Number	**Date of Issuance**	**Permit Condition Number**
R13-2831E	**01/21/2016**	**na**
R13-2831D	**09/24/2012**	**na**
R13-2831C	**2012-2010**	**na**
R13-2831B	**2012-2010**	**na**
R13-2831A	**2012-2010**	**na**
R13-2831	**09/09/2010**	**na**

23. Facility-Wide Emissions Summary [Tons per Year] - Reference SUPPLEMENT 03 – Emission Calculations	
Criteria Pollutants	**Potential Emissions**
Carbon Monoxide (CO)	**101.30**
Nitrogen Oxides (NOx)	**77.61**
Lead (Pb)	**---**
Particulate Matter (PM2.5)[1]	**9.44**
Particulate Matter (PM10)[1]	**9.44**
Total Particulate Matter (TSP)	**9.44**
Sulfur Dioxide (SO2)	**0.44**
Volatile Organic Compounds (VOC)	**112.16**
Hazardous Air Pollutants[2]	**Potential Emissions**
Acetaldehyde	**1.62**
Acrolein	**1.07**
Benzene	**0.41**
Butadiene, 1,3-	**0.10**
Ethylbenzene	**0.26**
Fornaldehyde (HCHO	**9.26**
Hexane, n-	**1.58**
Methanol (MeOH)	**1.65**
Polycyclic Organic Matter (POM/PAH)	**0.09**
Toluene	**0.37**
TMP, 2,2,4- (i-Octane)	**0.28**
Xylenes	**0.36**
Other/Trace HAP*	**0.07**
TOTAL HAPs	**17.11**
Regulated Pollutants other than Criteria and HAP	**Potential Emissions**
Carbon Dioxide (CO_2)	**99,500**
Nitrous Oxide (N_2O)	**0.54**
Methane (CH_4)	**667.66**
CO_2 equivalent (CO_2e)	**116,352**

[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.*

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

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 **- See next page - Misc Storage Tanks.**
☑	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 **-- See next page - Misc Storage Tanks**

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

Emission Unit ID	Misc. Storage Tanks Emission Unit Description	Design Capacity	VOC		HAP	
			lb/hr	lb/yr	lb/hr	lb/yr
TK-09	Storage Tank - Lube Oil	8,000 gal	Negligible	Negligible	Negligible	Negligible
TK-10	Storage Tank - Used Oil	2,000 gal	Negligible	Negligible	Negligible	Negligible
TK-11	Storage Tank - Methanol	5,000 gal	Negligible	Negligible	Negligible	Negligible
TK-12	Storage Tank - Methanol	5,000 gal	Negligible	Negligible	Negligible	Negligible
TK-13	Storage Tank - Glycol	5,000 gal	Negligible	Negligible	Negligible	Negligible
TK-14	Storage Tank - Glycol	1,000 gal	Negligible	Negligible	Negligible	Negligible
TK-15	Storage Tank - Triethylene Glycol	1,000 gal	Negligible	Negligible	Negligible	Negligible
TK-16	Storage Tank - Triethylene Glycol	1,000 gal	Negligible	Negligible	Negligible	Negligible
TK-17	Storage Tank - Antifreeze	1,000 gal	Negligible	Negligible	Negligible	Negligible
TK-18	Storage Tank - Lube Oil	300 gal	Negligible	Negligible	Negligible	Negligible
TK-19	Storage Tank - Lube Oil	300 gal	Negligible	Negligible	Negligible	Negligible
TK-20	Storage Tank - Lube Oil	300 gal	Negligible	Negligible	Negligible	Negligible
TK-21	Storage Tank - Lube Oil	300 gal	Negligible	Negligible	Negligible	Negligible
TK-22	Storage Tank - Lube Oil	300 gal	Negligible	Negligible	Negligible	Negligible
TK-23	Storage Tank - Lube Oil	300 gal	Negligible	Negligible	Negligible	Negligible
TK-24	Storage Tank - Oil/Water Mixture	395 gal	Negligible	Negligible	Negligible	Negligible
TK-25	Storage Tank - Oil/Water Mixture	395 gal	Negligible	Negligible	Negligible	Negligible
TK-26	Storage Tank - Oil/Water Mixture	395 gal	Negligible	Negligible	Negligible	Negligible
TK-27	Storage Tank - Oil/Water Mixture	395 gal	Negligible	Negligible	Negligible	Negligible
TK-28	Storage Tank - Oil/Water Mixture	395 gal	Negligible	Negligible	Negligible	Negligible

☑	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.

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

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**.

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 as defined in 45CSR§30-2.38.

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)

Name:	**Title:**
T. J. Rinke	**Vice President**

Responsible official's signature:

Signature: DocuSigned by: TJ Rinke DE800755CD4A4F0... Signature Date: 12/19/2023 | 11:10 AM PST

(Must be signed and dated in blue ink or have a valid electronic signature)

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)**

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 Map

(2019 USGS 7.5 Minute Topo)

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

- **Location:**
  Miller Compressor Station
  1779 Johnson Ridge
  (aka, Wetzel County Road 1/22)
  Bannen, WV 26033
  Wetzel and Marshall Counties

- **Latitude and Longitude:**
  Lat: 39°43'17.5" N Lon: -80°37'15.30" W
  Lat: 39.72153° N Lon: -80.62092° W

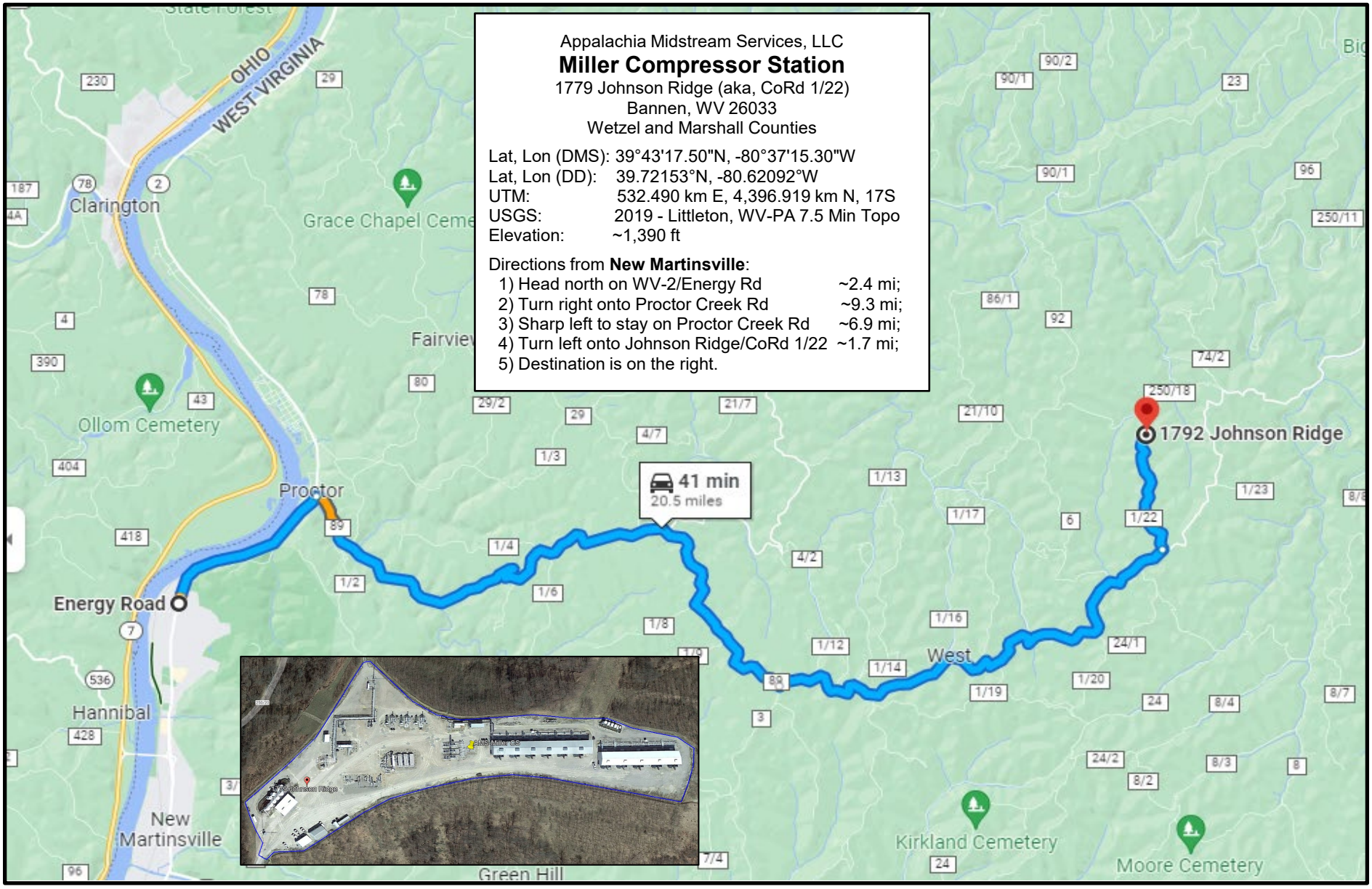
- **UTM:**
  532.490 km E x 4,396.919 N x 17S

- **Elevation:**
  ~1,390 ft

- **USGS:**
  2019 USGS Topo 7.5 Minute Map for Littleton, WV-PA

- **Directions:**
  From New Martinsville:
  1) Head north on WV-2 (Energy Rd) ~4.6 mi;
  2) Turn right onto Proctor Creek Rd ~9.3 mi;
  3) Sharp left to stay on Proctor Creek Rd ~6.9 mi;
  4) Turn left onto Johnson Ridge (CR-1/22) ~1.8 mi;
  5) Take slight right to destination.

Attachment A
Area Map



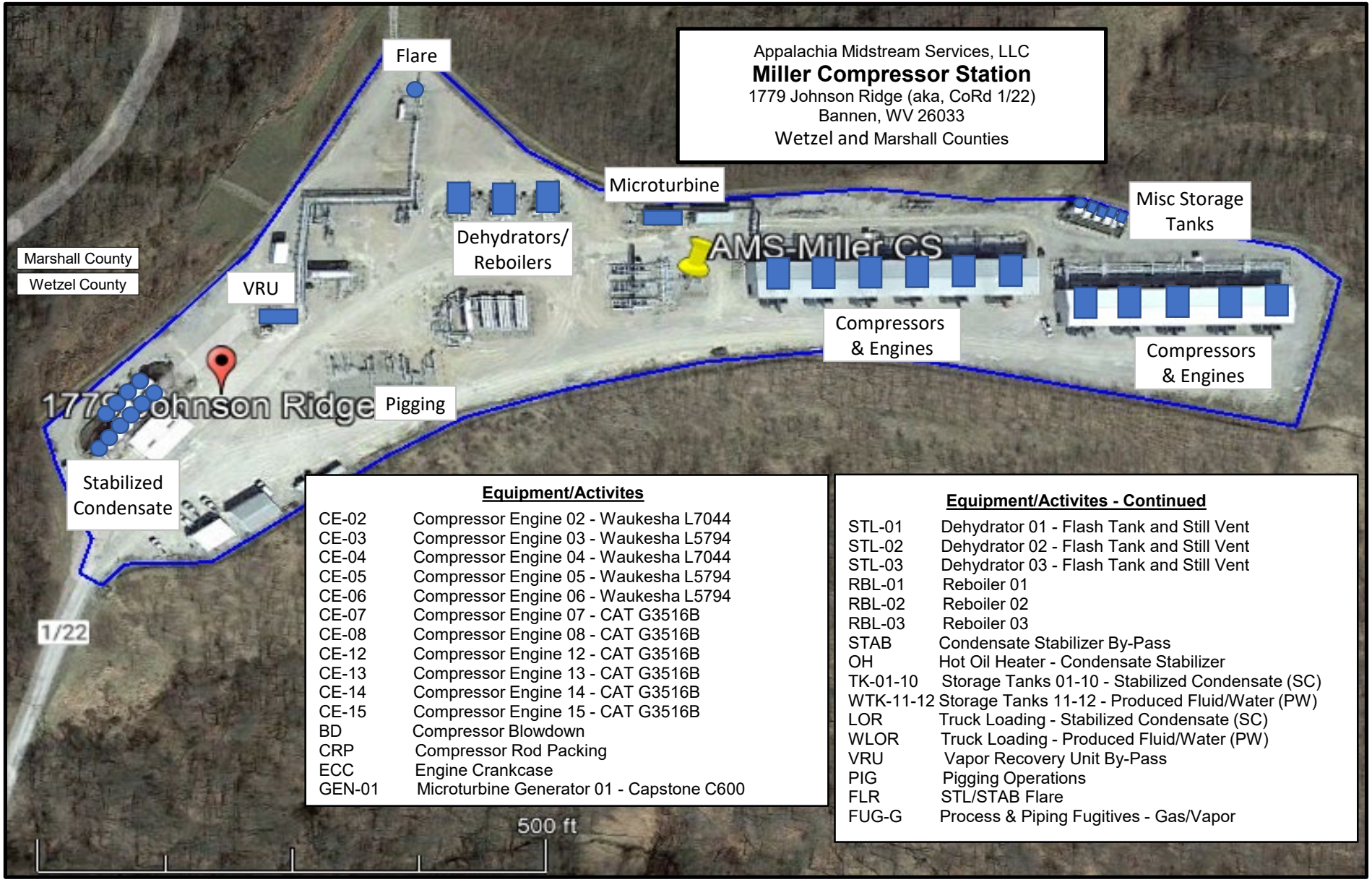
Attachment B

Plot Plan(s)

"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."

- **Plot Plan – Miller Compressor Station**

Attachment B
Plot Plan / Aerial View



Equipment/Activites

CE-02	Compressor Engine 02 - Waukesha L7044
CE-03	Compressor Engine 03 - Waukesha L5794
CE-04	Compressor Engine 04 - Waukesha L7044
CE-05	Compressor Engine 05 - Waukesha L5794
CE-06	Compressor Engine 06 - Waukesha L5794
CE-07	Compressor Engine 07 - CAT G3516B
CE-08	Compressor Engine 08 - CAT G3516B
CE-12	Compressor Engine 12 - CAT G3516B
CE-13	Compressor Engine 13 - CAT G3516B
CE-14	Compressor Engine 14 - CAT G3516B
CE-15	Compressor Engine 15 - CAT G3516B
BD	Compressor Blowdown
CRP	Compressor Rod Packing
ECC	Engine Crankcase
GEN-01	Microturbine Generator 01 - Capstone C600

Equipment/Activites - Continued

STL-01	Dehydrator 01 - Flash Tank and Still Vent
STL-02	Dehydrator 02 - Flash Tank and Still Vent
STL-03	Dehydrator 03 - Flash Tank and Still Vent
RBL-01	Reboiler 01
RBL-02	Reboiler 02
RBL-03	Reboiler 03
STAB	Condensate Stabilizer By-Pass
OH	Hot Oil Heater - Condensate Stabilizer
TK-01-10	Storage Tanks 01-10 - Stabilized Condensate (SC)
WTK-11-12	Storage Tanks 11-12 - Produced Fluid/Water (PW)
LOR	Truck Loading - Stabilized Condensate (SC)
WLOR	Truck Loading - Produced Fluid/Water (PW)
VRU	Vapor Recovery Unit By-Pass
PIG	Pigging Operations
FLR	STL/STAB Flare
FUG-G	Process & Piping Fugitives - Gas/Vapor

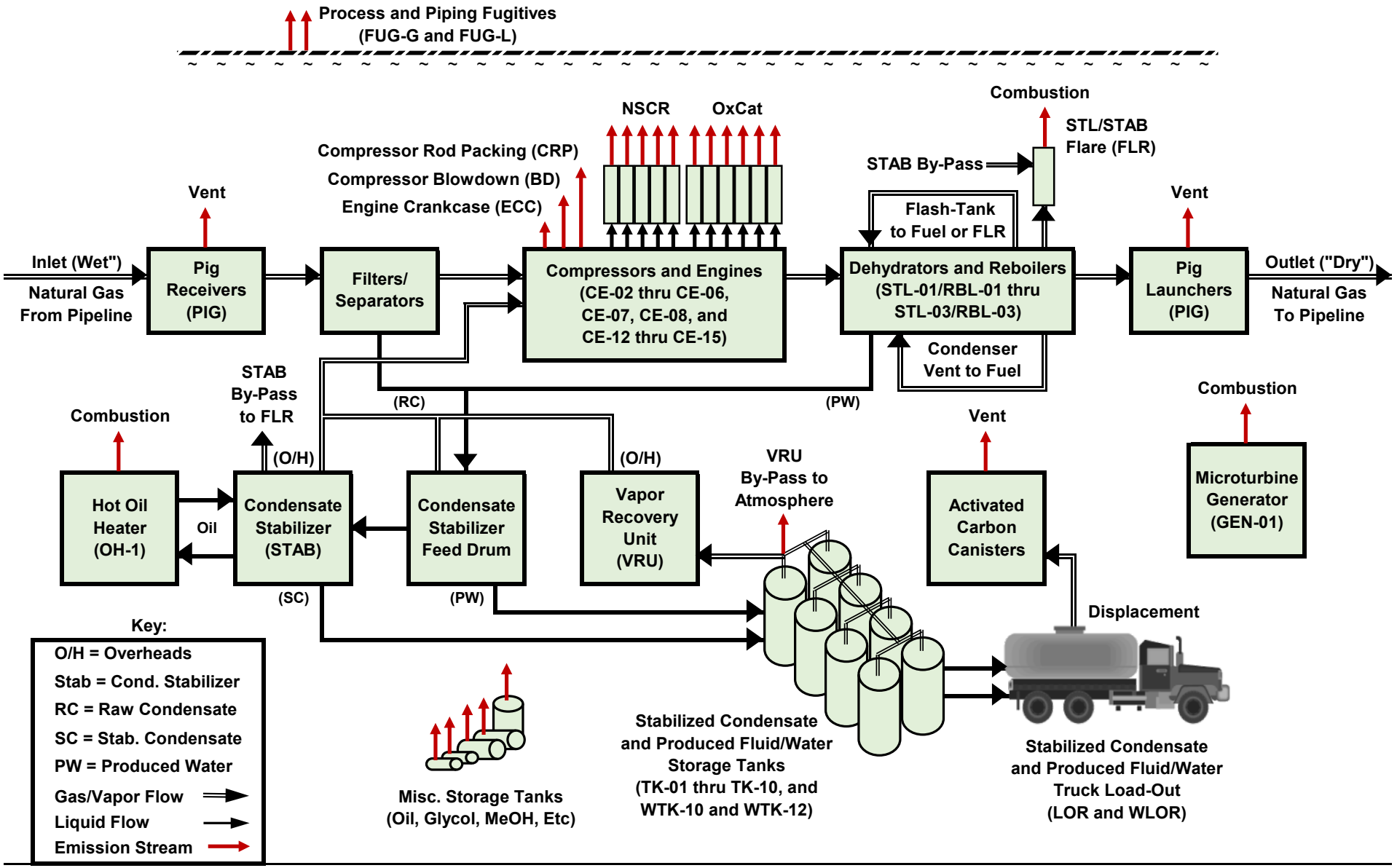
Attachment C

Process Flow Diagram(s) (PFD)

"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."

- **Process Flow Diagram (PFD) – Miller Compressor Station**

Attachment C
Process Flow Diagram (PFD)



Attachment D

Equipment Table

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

- **Title V Equipment Table – Miller Compressor Station**

Attachment D - Title V Equipment Table

(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 24 of the General Forms)

Emission Unit ID[1]	Emission Point ID[1]	Emission Unit Description	Year Installed	Design Capacity	Control Device[1]
EUCE-2	EPCE-2	Compressor Engine 02 - Waukesha L7044 GSI	2023	1,900 bhp	NSCR-02
EUCE-3	EPCE-3	Compressor Engine 03 - Waukesha L5794 GSI	2010	1,380 bhp	NSCR-03
EUCE-4	EPCE-4	Compressor Engine 04 - Waukesha L7044 GSI	2023	1,900 bhp	NSCR-04
EUCE-5	EPCE-5	Compressor Engine 05 - Waukesha L5794 GSI	2010	1,380 bhp	NSCR-05
EUCE-6	EPCE-6	Compressor Engine 06 - Waukesha L5794 GSI	2010	1,380 bhp	NSCR-06
EUCE-7	EPCE-7	Compressor Engine 07 - CAT G3516B	2012	1,380 bhp	OxCat -07
EUCE-8	EPCE-8	Compressor Engine 08 - CAT G3516B	2012	1,380 bhp	OxCat -08
EUCE-12	EPCE-12	Compressor Engine 12 - CAT G3516B	2017	1,380 bhp	OxCat -12
EUCE-13	EPCE-13	Compressor Engine 13 - CAT G3516B	2017	1,380 bhp	OxCat -13
EUCE-14	EPCE-14	Compressor Engine 14 - CAT G3516B	2017	1,380 bhp	OxCat -14
EUCE-15	EPCE-15	Compressor Engine 15 - CAT G3516B	2017	1,380 bhp	OxCat -15
EUBD	EPBD	Compressor Blowdown/Emergency Shutdown Tests	2010	574 Events/yr	---
EUCRP	EPCRP	Compressor Rod Packing	2010	11 Units	---
EUESU	EPESU	Engine Start-up	2010	11 Units	---
EUECC	EPECC	Engine Crankcase	2010	11 Units	---
EUGEN-1	EPGEN-1	Microturbine Generator-01 - Capstone C600	2010	805 bhp	---
EUSTL-1	EPSTL-1	Dehydrator 01 - Flash Tank and Still Vent	2010	55 MMscfd	Flash/FLR Still/Cond Recycle
EUSTL-2	EPSTL-2	Dehydrator 02 - Flash Tank and Still Vent	2010	55 MMscfd	Flash/FLR Still/Cond Recycle
EUSTL-3	EPSTL-3	Dehydrator 03 - Flash Tank and Still Vent	2010	55 MMscfd	Flash/FLR Still/Cond Recycle
EURBL-1	EPRBL-1	Reboiler 01	2010	1.0 MMBtu/hr	---
EURBL-2	EPRBL-2	Reboiler 02	2010	1.0 MMBtu/hr	---
EURBL-3	EPRBL-3	Reboiler 03	2010	1.0 MMBtu/hr	---
EUSTAB	EPSTAB	Condensate Stabilizer - Bypass to Flare	2010	120 hr/yr	FLR
EUOH-1	EPHOH-1	Hot Oil Heater - Condensate Stabilizer	2010	3.35 MMBtu/hr	---
EUTK-1-12	EPTK-1-12	Storage Tank 01-10 - Stabilized Condensate (SC)	2010	4,000 bbl (total)	VRU
		Storage Tank 11-12 - Produced Fluid/Water (PW)	2010	800 bbl (total)	
EULOR	EPLOR	Truck Loading - Stabilized Condensate (SC)	2010	11,498 Mgal/yr	CarbCan
		Truck Loading - Produced Fluid/Water (PW)	2010	1,533 Mgal/yr	
EUPIG	EPPIG	Pigging Operations	2010	624 Events/yr	---
APCFLARE	APCFLARE	Dehydrator/Stabilizer Flare (Combustion Only)	2010	5.0 MMBtu/hr	---
EUFUG	EPFUG	Piping & Equip Leaks - Gas/Vapor	2010	7,472 Units	LDAR
		Piping & Equip Leaks - Light Liquid/Oil	2010	2,271 Units	

[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

Emissions Unit Form(s)

"26a. For each emission unit listed in the Title V Equipment Table, fill out and provide an Emission Unit Form as ATTACHMENT E."

- **Compressor Engine 02 and 04 – 1,900 bhp Waukesha L7044 GSI (4SRB) w/NSCR**
- **Compressor Engine 03, 05 & 06 – 1,380 bhp Waukesha L5794 GSI (4SRB) w/NSCR**
- **Compressor Engine 07, 08, and 12 thru 15 – 1,380 bhp CAT G3516B (4SLB) w/OxCat**
- **Compressor Blowdown/Emergency Shutdown Testing**
- **Compressor Rod Packing**
- **Engine Start-up**
- **Engine Crankcase**
- **Microturbine Generator 01 - 805 bhp Capstone C600**
- **Dehydrator 01 thru 03 – 55.0 MMscfd w/Flash-Tank and Still Vent Condenser**
- **Reboiler 01 thru 03 – 1.00 MMBtu/hr**
- **Condensate Stabilizer – By-Pass to Flare**
- **Hot Oil Heater – 3.35 MMBtu/hr**
- **Stabilized Condensate (SC) – 400 bbl Each Storage Tank 01 thru 10**
- **Produced Fluid/Water (PW) – 400 bbl Each Storage Tank 11 and 12**
- **Stabilized Condensate (SC) – Truck Load-Out w/Activated Carbon Canisters**
- **Produced Fluid/Water (PW) – Truck Load-Out w/Activated Carbon Canisters**
- **Pigging Operations**
- **Piping & Equipment Fugitives – Gas/Vapor**
- **Piping & Equipment Fugitives – Light Liquid/Oil**

Attachment E - Emission Unit Form

Emission Unit Description		CE-02 & CE-04
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
CE-02 & CE-04	Compressor Engine	NSCR-02 & NSCR-04

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Natural gas-fueled, 4-stroke, rich burn, reciprocating internal combustion engine (4SRB-RICE); drives a natural gas reciprocating compressor. Exhaust from combustion of the natural gas fuel in the engine is controlled by a catalyst (NSCR-02 & NSCR-04).

Manufacturer:	Model number:	Serial number(s):
Waukesha	L7044GSI	---
Construction date:	**Installation date:**	**Modification date(s):**
After 07/01/10	2023	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

1,900 bhp

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule:
15.54 MMBtu/hr (fuel)	136,131 MMBtu/yr (fuel)	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?
Natural Gas	___ Indirect _X_Direct
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
1,900 bhp	15.54 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.

Natural gas	15,235 scf/hr	133.46 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	<0.01%	negligible	1,020 Btu/scf

Emission Unit Description	CE-02 & CE-04

Criteria Pollutants	Pollutant Emissions	
	PPH	TPY
Carbon Monoxide (CO)	2.47	10.82
Nitrogen Oxides (NOX)	1.26	5.50
Lead (Pb)	---	---
Particulate Matter (PM2.5)	0.30	1.32
Particulate Matter (PM10)	0.30	1.32
Total Particulate Matter (TSP)	0.30	1.32
Sulfur Dioxide (SO2)	0.01	0.04
Volatile Organic Compounds (VOC)	0.20	0.85

Hazardous Air Pollutants	Pollutant Emissions	
	PPH	TPY
Acetaldehyde	0.02	0.09
Acrolein	0.02	0.09
Benzene	0.01	0.05
Butadiene, 1,3-	5E-03	0.02
Ethylbenzene	2E-04	8E-04
Formaldehyde	0.05	0.22
Hexane, n-	---	---
Methanol	0.02	0.10
POM/PAH	2E-03	0.01
Toluene	4E-03	0.02
TMP, 2,2,4-	---	---
Xylenes	2E-03	0.01
Other/Trace HAP	1E-03	0.01
Total HAP	0.14	0.63

Regulated Pollutants other than Criteria and HAP	Pollutant Emissions	
	PPH	TPY
Carbon Dioxide (CO2)	1,948	8,531
Methane (CH4) (GWP=25)	1.01	4.40
Nitrous Oxide (N2O) (GWP=298)	3E-03	0.02
CO2 Equivalent (CO2e)	1,974	8,646

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.).

NOx, CO, NMNEHC, VOC, and HCHO: Vendor data.
N2O and CO2e: 40CFR98-Subpart C
All other: AP-42

Please reference Supplement S3 - Emission Calculations
Also Supplement S5 - Vendor Data

Emission Unit Description **CE-02 & CE-04**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

b. Maximum emissions from each of the 1,900 hp natural gas fired reciprocating compressor engines equipped with NSCR, Waukesha L7044 GSI (EPCE-2a, EPCE-4a) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	1.26	5.50
Carbon Monoxide	2.47	10.82
Volatile Organic Compounds (includes formaldehyde)	0.20	0.85
Formaldehyde	0.05	0.22

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		CE-03, CE-05, CE-06
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
CE-03, CE-05, CE-06	Compressor Engine (Each of Three (3) Units)	NSCR-03, NSCR-05, NSCR-06

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Each of three (3) natural gas-fueled, 4-stroke, rich burn, reciprocating internal combustion engines (4SRB-RICE); each drives a natural gas reciprocating compressor. Exhaust from combustion of the natural gas fuel in each engine is controlled by a catalyst (NSCR-03, NSCR-05, NSCR-06).

Manufacturer:	Model number:	Serial number(s):
Waukesha	L5794GSI	---
Construction date:	**Installation date:**	**Modification date(s):**
After 07/01/10	2010	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

1,380 bhp (each)

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule:
10.36 MMBtu/hr (fuel)	90,787 MMBtu/yr (fuel)	8,760 hr/yr (each)

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? _X_ Yes ___No	If yes, is it?
Natural Gas	___ Indirect _X_Direct
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
1,380 bhp	10.36 MMBtu/hr (each)

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

Natural gas 10,161 scf/hr (each) 89.01 MMscf/yr (each)

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	<0.01%	negligible	1,020 Btu/scf

Emission Unit Description	CE-03, CE-05, CE-06

Criteria Pollutants	Pollutant Emissions	
	PPH (each)	TPY (each)
Carbon Monoxide (CO)	1.81	7.92
Nitrogen Oxides (NOX)	1.48	6.48
Lead (Pb)	---	---
Particulate Matter (PM2.5)	0.20	0.88
Particulate Matter (PM10)	0.20	0.88
Total Particulate Matter (TSP)	0.20	0.88
Sulfur Dioxide (SO2)	0.01	0.03
Volatile Organic Compounds (VOC)	0.17	0.76

Hazardous Air Pollutants	Pollutant Emissions	
	PPH (each)	TPY (each)
Acetaldehyde	4E-03	0.02
Acrolein	4E-03	0.02
Benzene	3E-03	0.01
Butadiene, 1,3-	1E-03	5E-03
Ethylbenzene	4E-05	2E-04
Formaldehyde	0.02	0.10
Hexane, n-	---	---
Methanol	0.00	0.02
POM/PAH	4E-04	2E-03
Toluene	9E-04	4E-03
TMP, 2,2,4-	---	---
Xylenes	3E-04	1E-03
Other/Trace HAP	3E-04	1E-03
Total HAP	0.04	0.19

Regulated Pollutants other than Criteria and HAP	Pollutant Emissions	
	PPH (each)	TPY (each)
Carbon Dioxide (CO2)	1,603	7,023
Methane (CH4) (GWP=25)	2.38	10.44
Nitrous Oxide (N2O) (GWP=298)	2E-03	0.01
CO2 Equivalent (CO2e)	1,664	7,287

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.).

NOx, CO, NMNEHC, VOC, and HCHO: Vendor data.
N2O and CO2e: 40CFR98-Subpart C
All other: AP-42

Please reference Supplement S3 - Emission Calculations
Also Supplement S5 - Vendor Data

Emission Unit Description	CE-03, CE-05, CE-06

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

5.1.1. a. Maximum emissions from each of the 1,380 hp natural gas fired reciprocating compressor engines equipped with NSCR, Waukesha L5794 GSI (EPCE-2, EPCE-3, EPCE-4, EPCE-5, EPCE-6) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	1.48	6.48
Carbon Monoxide	1.81	7.92
Volatile Organic Compounds (includes formaldehyde)	0.17	0.76
Formaldehyde	0.02	0.10

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		CE-07, CE-08, CE-11-15
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
CE-07, CE-08, CE-11-15	Compressor Engine (Each of Six (6) Units)	OxCat-07, -08, 11-15

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Each of six (6) natural gas-fueled, 4-stroke, lean burn, reciprocating internal combustion engines (4SLB-RICE); each drives a natural gas reciprocating compressor. Exhaust from combustion of the natural gas fuel in each engine is controlled by a catalyst (OxCat-07, -08, 11-15).

Manufacturer:	Model number:	Serial number(s):
Caterpillar	G3516B	---
Construction date:	**Installation date:**	**Modification date(s):**
After 07/01/10	2012 & 2017	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

1,380 bhp (each)

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule:
11.35 MMBtu/hr (fuel)	99,442 MMBtu/yr (fuel)	8,760 hr/yr (each)

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? _X_ Yes ___No	If yes, is it?
Natural Gas	___ Indirect _X_Direct
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
1,380 bhp	11.35 MMBtu/hr (each)

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

Natural gas 11,129 scf/hr (each) 97.49 MMscf/yr (each)

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	<0.01%	negligible	1,020 Btu/scf

Emission Unit Description	CE-07, CE-08, CE-11-15

Criteria Pollutants	Pollutant Emissions	
	PPH (each)	TPY (each)
Carbon Monoxide (CO)	1.52	6.66
Nitrogen Oxides (NOX)	1.52	6.66
Lead (Pb)	---	---
Particulate Matter (PM2.5)	0.11	0.50
Particulate Matter (PM10)	0.11	0.50
Total Particulate Matter (TSP)	0.11	0.50
Sulfur Dioxide (SO2)	0.01	0.03
Volatile Organic Compounds (VOC)	1.19	5.20

Hazardous Air Pollutants	Pollutant Emissions	
	PPH (each)	TPY (each)
Acetaldehyde	0.05	0.23
Acrolein	0.03	0.14
Benzene	3E-03	0.01
Butadiene, 1,3-	2E-03	0.01
Ethylbenzene	2E-04	1E-03
Formaldehyde	0.31	1.38
Hexane, n-	0.01	0.03
Methanol	0.02	0.07
POM/PAH	2E-03	0.01
Toluene	3E-03	0.01
TMP, 2,2,4-	2E-03	0.01
Xylenes	1E-03	5E-03
Other/Trace HAP	2E-03	0.01
Total HAP	0.43	1.90

Regulated Pollutants other than Criteria and HAP	Pollutant Emissions	
	PPH (each)	TPY (each)
Carbon Dioxide (CO2)	1,603	7,023
Methane (CH4) (GWP=25)	14.19	62.15
Nitrous Oxide (N2O) (GWP=298)	3E-03	0.01
CO2 Equivalent (CO2e)	1,959	8,580

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.).

NOx, CO, NMNEHC, VOC, and HCHO: Vendor data.
N2O and CO2e: 40CFR98-Subpart C
All other: AP-42

Please reference Supplement S3 - Emission Calculations
Also Supplement S5 - Vendor Data

Emission Unit Description **CE-07, CE-08, CE-11-15**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

c. Maximum emissions from each of the 1,380 hp natural gas fired reciprocating compressor engines equipped with Oxidation Catalysts, CAT G3516B (EPCE-7, EPCE-8, EPCE-12, EPCE-13, EPCE-14, EPCE-15) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	1.52	6.66
Carbon Monoxide	1.52	6.66
Volatile Organic Compounds (includes formaldehyde)	1.19	5.20
Formaldehyde	0.31	1.38

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		BD
Emission unit ID number: **BD**	**Emission unit name:** **Compressor Blowdown and Emergency Shutdown Testing**	**List any control devices associated with this emission unit:** **na**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

When an engine is shutdown, the natural gas contained within the compressor and associated piping must be evacuated (compressor blowdown, BD). Additionally, there will be other infrequent emissions such as emergency shutdown (ESD) testing.

Manufacturer:	**Model number:**	**Serial number(s):**
na	**na**	**na**
Construction date:	**Installation date:**	**Modification date(s):**
na	**2010 - 2023**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

na

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
na	**na**	**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 ___ Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	**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 Unit Description		BD
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)	**4.15**	**18.17**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	---	---
Acrolein	---	---
Benzene	**0.01**	**0.06**
Butadiene, 1,3-	---	---
Ethylbenzene	**0.01**	**0.06**
Formaldehyde	---	---
Hexane, n-	**0.06**	**0.28**
Methanol	**0.01**	**0.06**
POM/PAH	---	---
Toluene	**0.01**	**0.06**
TMP, 2,2,4-	**0.01**	**0.06**
Xylenes	**0.01**	**0.06**
Other/Trace HAP	---	---
Total HAP	**0.18**	**0.78**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**0.00**	**0.02**
Methane (CH4) (GWP=25)	**0.48**	**2.11**
Nitrous Oxide (N2O) (GWP=298)	---	---
CO2 Equivalent (CO2e)	**12.07**	**53**

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.).

Mass balance and engineering judgment

Please reference Supplement S3 - Emission Calculations
Also Supplement S5 - Vendor Data

Emission Unit Description **BD**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

10.0. Source-Specific Requirements (Blowdowns, Engine Startups, Pigging)

10.1. Limitations and Standards

10.1.1. The maximum number of compressor blowdown events per year shall not exceed 572, with an estimated total of 3.97 MMscf per year. Compliance shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the compressor blowdown events at any given time during the previous twelve consecutive calendar months.

10.1.3. The maximum number of emergency plant shutdown tests per year shall not exceed 2, with an estimated total of 0.46 MMscf per year. Compliance shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the emergency plant shutdown events at any given time during the previous twelve consecutive calendar months.

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		CRP
Emission unit ID number: CRP	**Emission unit name:** Compressor Rod Packing (Sum of Eleven (11) Units)	**List any control devices associated with this emission unit:** na

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

The reciprocating compressor operations result in emissions from the wear of mechanical seals around the piston rods over time. These emissions are generated from the compressors associated with the gas-fired compressor engines (CE-02 through CE-15).

Manufacturer:	**Model number:**	**Serial number(s):**
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2010 - 2023	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

na

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

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ___ Yes _X_No	**If yes, is it?** ___ Indirect ___ Direct
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	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 Unit Description		**CRP**
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)	**4.98**	**21.81**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**0.02**	**0.07**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**0.02**	**0.07**
Formaldehyde	**---**	**---**
Hexane, n-	**0.08**	**0.33**
Methanol	**0.06**	**0.27**
POM/PAH	**---**	**---**
Toluene	**0.06**	**0.27**
TMP, 2,2,4-	**0.02**	**0.07**
Xylenes	**0.02**	**0.07**
Other/Trace HAP	**---**	**---**
Total HAP	**0.21**	**0.93**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**0.04**	**0.18**
Methane (CH4) (GWP=25)	**5.52**	**24.17**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**137.98**	**604**

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 engineering judgment

Please reference Supplement S3 - Emission Calculations
Also Supplement S5 - Vendor Data

Emission Unit Description **CRP**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

13.0. Source-Specific Requirements (Rod Packing Requirements Reciprocating Compressor Engines (EPCE-2a, 4a, 7, 8, 12, 13, 14, 15))

13.1. Limitations and Standards

13.1.1. Maximum aggregate rod packing emissions from engines (EPCE-2, 2a, 3, 4, 4a, 5, 6, 7, 8, 12, 13, 14, 15) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	4.98	21.81

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		ESU
Emission unit ID number: ESU	**Emission unit name:** Engine Startup	**List any control devices associated with this emission unit:** na

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Startup of the reciprocating compressor engines result in emissions from the displacement of natural gas to atmosphere that is used to spin up the engines.

Manufacturer:	Model number:	Serial number(s):
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2010 - 2023	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

na

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule:
na	na	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 ___ Direct
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	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 Unit Description		**ESU**
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**---**	**---**
Nitrogen Oxides (NOX)	**---**	**---**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**---**	**---**
Particulate Matter (PM10)	**---**	**---**
Total Particulate Matter (TSP)	**---**	**---**
Sulfur Dioxide (SO2)	**---**	**---**
Volatile Organic Compounds (VOC)	**1.50**	**6.57**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**5E-03**	**0.02**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**5E-03**	**0.02**
Formaldehyde	**---**	**---**
Hexane, n-	**0.02**	**0.10**
Methanol	**0.02**	**0.08**
POM/PAH	**---**	**---**
Toluene	**5E-03**	**0.02**
TMP, 2,2,4-	**5E-03**	**0.02**
Xylenes	**5E-03**	**0.02**
Other/Trace HAP	**---**	**---**
Total HAP	**0.06**	**0.28**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**0.05**	**0.24**
Methane (CH4) (GWP=25)	**7.28**	**31.87**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**181.97**	**797**

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 engineering judgment

Please reference Supplement S3 - Emission Calculations
Also Supplement S5 - Vendor Data

Emission Unit Description	ESU

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

10.1.2. The maximum number of engine startup events per year shall not exceed 2,288, with an estimated total of 1.65 MMscf per year. Compliance shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the engine startup events at any given time during the previous twelve consecutive calendar months.

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		ECC
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ECC	**Engine Crankcase (Sum of Eleven (11) Units)**	**na**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Internal combustion results in a small but continual amount of blow-by, which occurs when some of the gases from combustion leak past the piston rings to end up inside the crankcase, causing pressure to build up in the crank case. These engine crankcase blow-by gases are vented to the atmosphere.

Manufacturer:	**Model number:**	**Serial number(s):**
na	**na**	**na**
Construction date:	**Installation date:**	**Modification date(s):**
na	**2010 - 2023**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

na

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

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ___ Yes _X_No	**If yes, is it? ___ Indirect ___ Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	**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 Unit Description		**ECC**
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**0.06**	**0.24**
Nitrogen Oxides (NOX)	**0.01**	**0.04**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**8E-04**	**3E-03**
Particulate Matter (PM10)	**8E-04**	**3E-03**
Total Particulate Matter (TSP)	**8E-04**	**3E-03**
Sulfur Dioxide (SO2)	**5E-05**	**2E-04**
Volatile Organic Compounds (VOC)	**0.02**	**0.09**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**3E-03**	**0.01**
Acrolein	**2E-03**	**0.01**
Benzene	**1E-04**	**6E-04**
Butadiene, 1,3-	**9E-05**	**4E-04**
Ethylbenzene	**1E-05**	**6E-05**
Formaldehyde	**0.04**	**0.17**
Hexane, n-	**4E-04**	**2E-03**
Methanol	**8E-04**	**4E-03**
POM/PAH	**1E-04**	**5E-04**
Toluene	**1E-04**	**6E-04**
TMP, 2,2,4-	**8E-05**	**4E-04**
Xylenes	**6E-05**	**3E-04**
Other/Trace HAP	**1E-04**	**5E-04**
Total HAP	**0.05**	**0.20**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**47.34**	**207.34**
Methane (CH4) (GWP=25)	**0.42**	**1.84**
Nitrous Oxide (N2O) (GWP=298)	**7E-05**	**3E-04**
CO2 Equivalent (CO2e)	**57.83**	**253.32**

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 engineering judgment

Please reference Supplement S3 - Emission Calculations
Also Supplement S5 - Vendor Data

Emission Unit Description **ECC**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

There are no applicable requirements specified for this emissions unit.

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		GEN-1
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
GEN-1	**Microturbine Generator**	**na**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Natural gas-fueled, microturbine drives an electrical generator. Exhaust from combustion of the natural gas fuel in the microturbine is vented to atmosphere.

Manufacturer:	**Model number:**	**Serial number(s):**
Capstone	**C600**	**---**
Construction date:	**Installation date:**	**Modification date(s):**
2010	**2010**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

805 bhp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
13.68 MMBtu/hr (fuel)	**119,838 MMBtu/yr (fuel)**	**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?**
Natural Gas	**___ Indirect _X_Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
805 bhp	**13.68 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 13,412 scf/hr 117.49 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	<0.01%	negligible	1,020 Btu/scf

Emission Unit Description		GEN-1
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**1.32**	**5.78**
Nitrogen Oxides (NOX)	**0.48**	**2.10**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**0.18**	**0.79**
Particulate Matter (PM10)	**0.18**	**0.79**
Total Particulate Matter (TSP)	**0.18**	**0.79**
Sulfur Dioxide (SO2)	**0.02**	**0.07**
Volatile Organic Compounds (VOC)	**0.14**	**0.61**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**1E-03**	**5E-03**
Acrolein	**2E-04**	**8E-04**
Benzene	**3E-04**	**1E-03**
Butadiene, 1,3-	**1E-05**	**5E-05**
Ethylbenzene	**9E-04**	**4E-03**
Formaldehyde	**0.02**	**0.09**
Hexane, n-	**---**	**---**
Methanol	**---**	**---**
POM/PAH	**9E-04**	**4E-03**
Toluene	**4E-03**	**0.02**
TMP, 2,2,4-	**---**	**---**
Xylenes	**2E-03**	**0.01**
Other/Trace HAP	**8E-04**	**3E-03**
Total HAP	**0.03**	**0.13**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**3,010**	**13,182**
Methane (CH4) (GWP=25)	**0.24**	**1.04**
Nitrous Oxide (N2O) (GWP=298)	**0.08**	**0.36**
CO2 Equivalent (CO2e)	**3,040**	**13,315**

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.).

NOx, CO, NMNEHC, VOC, and HCHO: Vendor data.
N2O and CO2e: 40CFR98-Subpart C
All other: AP-42

Please reference Supplement S3 - Emission Calculations
Also Supplement S5 - Vendor Data

Emission Unit Description **GEN-1**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

5.1.3. Maximum emissions from the 805 hp natural gas fired microturbine generator, Capstone C600 (EUGEN-1) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	0.48	2.10
Carbon Monoxide	1.32	5.78
Volatile Organic Compounds (includes formaldehyde)	0.13	0.57
Formaldehyde	0.01	0.04

_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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		STL-1 thru STL-3
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
STL-1 thru STL-3	**3 x 55.0 MMscfd Dehydrators**	**BTEX-01 thru BTEX-03**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Three (3) Dehydrators are utilized at the facility. Each dehydrator is comprised of a Contactor/Absorber Tower (no vented emissions), a Flash Tank (98% Flare Control), and a Regenerator/Still Vent BTEX Buster and Recycle (100% Control).

Manufacturer:	**Model number:**	**Serial number(s):**
NATCO	**55.0 MMscfd**	**---**
Construction date:	**Installation date:**	**Modification date(s):**
na	**2010**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

55.0 MMscfd (each)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
2.29 MMscf/hr (each)	**20,075 MMscf/yr (each)**	**8,760 hr/yr (each)**

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ___ Yes _X_No	**If yes, is it? ___ Indirect ___ Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	**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 Unit Description	**STL-1 thru STL-3**

Criteria Pollutants	**Pollutant Emissions**	
	PPH (each)	**TPY (each)**
Carbon Monoxide (CO)	**---**	**---**
Nitrogen Oxides (NOX)	**---**	**---**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**---**	**---**
Particulate Matter (PM10)	**---**	**---**
Total Particulate Matter (TSP)	**---**	**---**
Sulfur Dioxide (SO2)	**---**	**---**
Volatile Organic Compounds (VOC)	**0.32**	**1.40**

Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH (each)	**TPY (each)**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**2E-03**	**0.01**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**3E-07**	**1E-06**
Formaldehyde	**---**	**---**
Hexane, n-	**4E-03**	**0.02**
Methanol	**---**	**---**
POM/PAH	**---**	**---**
Toluene	**2E-03**	**0.01**
TMP, 2,2,4-	**2E-03**	**0.01**
Xylenes	**2E-03**	**0.01**
Other/Trace HAP	**---**	**---**
Total HAP	**0.04**	**0.17**

Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH (each)	**TPY (each)**
Carbon Dioxide (CO2)	**0.92**	**4.03**
Methane (CH4) (GWP=25)	**0.52**	**2.28**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**13.95**	**61.12**

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

GRI-GLYCalc, Extended Gas Anakysis, and Operation Records

Please reference Supplement S3 - Emission Calculations
Also Supplement S6 - Emission Programs

Emission Unit Description **STL-1 thru STL-3**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

6.1.1. Maximum Throughput Limitation. The maximum dry natural gas throughput to each of the glycol dehydration units shall not exceed the following:

Emission Unit ID#	Emission Point ID#	Emission Unit	Design Capacity
EUSTL-1	APCFLARE	Dehy Still Vent/Flash Tank Controlled by Condenser/Flare	55 MMscfd
EUSTL-2	APCFLARE	Dehy Still Vent/Flash Tank Controlled by Condenser/Flare	55 MMscfd
EUSTL-3	APCFLARE	Dehy Still Vent/Flash Tank Controlled by Condenser/Flare	55 MMscfd

6.1.2. Recycled reboilers controlling the Dehydrator Flash Tanks shall be designed and operated in accordance with the following:

a. The vapors/overheads from the flash tanks shall be routed through a closed vent system to the reboiler at all times when there is a potential that vapors (emissions) can be generated from the flash tank.

b. The reboiler shall only be fired with vapors from the flash tank, and natural gas may be used as supplemental fuel.

c. The vapors/overheads from the flash tank shall be introduced into the flame zone of the reboiler.

6.1.3. *Condensers.* The permittee shall comply with the requirements below:

a. The still vent of each dehydration unit shall be routed to a dedicated BTEX Condenser and BTEX Accumulator (2-phase separator) though a closed vent system. The non-condensable gas from each BTEX Accumulator shall be vented back to the respective reboiler though a closed vent system.

b. Each glycol dehydration unit/still column (EPSTL-1, EPSTL-2, & EPSTL-3) shall be equipped with a fully functional BTEX Buster (APCCOND-1, APCCOND-2, and APCOND-3) at all times. The control device(s) (APCCOND-1, APCCOND-2, and APCCOND-3) shall be operated according to manufacturer's specifications, and shall be properly maintained in a manner which prevents the unit from freezing.

c. The non-condensable gas from the BTEX Accumulator shall be routed to the reboiler and combusted though a closed vent system.

d. The flash tank off-gases from each flash tank shall be routed to flash gas header to the reboiler burner or to the inlet separator of the station for re-processing. The routing of the flash tank off-gases shall be done through a closed vent system.

e. The pilot light for each reboiler burner shall be lit at all times when the dehydration unit is in operation.

f. The maximum flow rate of glycol through each dehydration unit shall not exceed 15 gpm. The unit be operated either with an electric or gas pneumatic driven pumps that does not exceed the above flow rate.

g. The BTEX Condenser shall be operated in a manner to prevent liquids carryover to the respective reboiler

h. The system shall be constructed of hard piping

i. The system shall be constructed and maintained free of leaks.

j. Detected leaks shall be addressed in accordance with the applicable fugitive emission requirements specified in 40 CFR Part 60, Subpart OOOOa.

[45CSR§13-5.10.]

Emission Unit Description	**STL-1 thru STL-3**
_X_ Permit Shield	
For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)**	
Please Reference WVDEP-DAQ Permit R13-2831F **(Also SUPPLEMENT S2 – Regulatory Discussion)** **There are no requested changes**	
Are you in compliance with all applicable requirements for this emissions unit?	☑ **Yes** ☐ No
If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.	**(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		RBL-01 thru RBL-03
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
RBL-01 thru RBL-03	**Dehydration Unit Reboilers**	**na**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

One (1) gas-fueled reboiler is utilized to supply heat to each Dehydrator's Regenerator/Still.

Manufacturer:	**Model number:**	**Serial number(s):**
na	**na**	**na**
Construction date:	**Installation date:**	**Modification date(s):**
na	**2010**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

1.00 MMBtu/hr

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

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? _X_ Yes ___ No	**If yes, is it? ___ Indirect _X_ Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
1.00 MMBtu/hr	**1.00 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 462 scf/hr (each) 4.05 MMscf/yr (each)

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	<0.01%	negligible	1,020 Btu/scf

Emission Unit Description	RBL-01 thru RBL-03

Criteria Pollutants	Pollutant Emissions	
	PPH (each)	TPY (each)
Carbon Monoxide (CO)	0.08	0.36
Nitrogen Oxides (NOX)	0.10	0.43
Lead (Pb)	---	---
Particulate Matter (PM2.5)	0.01	0.03
Particulate Matter (PM10)	0.01	0.03
Total Particulate Matter (TSP)	0.01	0.03
Sulfur Dioxide (SO2)	6E-04	3E-03
Volatile Organic Compounds (VOC)	0.01	0.02

Hazardous Air Pollutants	Pollutant Emissions	
	PPH (each)	TPY (each)
Acetaldehyde	---	---
Acrolein	---	---
Benzene	2E-06	9E-06
Butadiene, 1,3-	---	---
Ethylbenzene	---	---
Formaldehyde	7E-05	3E-04
Hexane, n-	2E-03	0.01
Methanol	---	---
POM/PAH	7E-07	3E-06
Toluene	3E-06	1E-05
TMP, 2,2,4-	---	---
Xylenes	---	---
Other/Trace HAP	1E-06	5E-06
Total HAP	2E-03	0.01

Regulated Pollutants other than Criteria and HAP	Pollutant Emissions	
	PPH (each)	TPY (each)
Carbon Dioxide (CO2)	116.98	512
Methane (CH4) (GWP=25)	2E-03	0.01
Nitrous Oxide (N2O) (GWP=298)	2E-04	1E-03
CO2 Equivalent (CO2e)	117.10	512.89

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

AP-42

Please reference Supplement S3 - Emission Calculations

Emission Unit Description **RBL-01 thru RBL-03**

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.

Please Reference WVDEP-DAQ TVOP-R30-05100145-2019, Issued 01/29/2019
Also Supplement S2 - Regulatory Discussion
There are no requested changes

10.0. Source-Specific Requirements (Reboilers, Heater Treaters)

10.1. Limitations and Standards

10.1.1. Maximum Design Heat Input. The maximum design heat input (MDHI) shall not exceed the following:

Emission Unit ID#	Emission Unit Description	MDHI (MMBTU/hr)
EURBL-1	Glycol Dehydration Reboiler	1.0
EURBL-2	Glycol Dehydration Reboiler	1.0
EURBL-3	Glycol Dehydration Reboiler	1.0
EUHT-1	Heater Treater	1.0
EUHT-2	Heater Treater	1.0

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ TVOP-R30-05100145-2019, Issued 01/29/2019
Also Supplement S2 - Regulatory Discussion
There are no requested changes

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

Attachment E - Emission Unit Form

Emission Unit Description		STAB
Emission unit ID number: STAB	**Emission unit name:** Condensate Stabilizer - Bypass to Flare	**List any control devices associated with this emission unit:** FLR

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

The condensate stabilizer overheads will normally be captured by a VRU and routed to the facility inlet; however, for operating flexibility and during maintenance activities, the stabilizer overheads will be sent to the flare for up to 5 days per year (i.e., 120 hours) for 98% control of the vapors.

Manufacturer:	Model number:	Serial number(s):
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2010	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

na

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule:
na	na	8,760 hr/yr (each)

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ___ Yes _X_No	If yes, is it? ___ Indirect ___ Direct
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	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 Unit Description		**STAB**
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**---**	**---**
Nitrogen Oxides (NOX)	**---**	**---**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**---**	**---**
Particulate Matter (PM10)	**---**	**---**
Total Particulate Matter (TSP)	**---**	**---**
Sulfur Dioxide (SO2)	**---**	**---**
Volatile Organic Compounds (VOC)	**0.10**	**0.44**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**5E-05**	**2E-04**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**5E-05**	**2E-04**
Formaldehyde	**---**	**---**
Hexane, n-	**2E-03**	**0.01**
Methanol	**5E-05**	**2E-04**
POM/PAH	**---**	**---**
Toluene	**5E-05**	**2E-04**
TMP, 2,2,4-	**3E-04**	**2E-03**
Xylenes	**5E-05**	**2E-04**
Other/Trace HAP	**---**	**---**
Total HAP	**2E-03**	**0.01**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**0.03**	**0.15**
Methane (CH4) (GWP=25)	**0.03**	**0.14**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**0.85**	**3.72**

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 engineering judgment

Please reference Supplement S3 - Emission Calculations
Also Supplement S5 - Vendor Data

Emission Unit Description **STAB**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

8.0. Source-Specific Requirements (Condensate Stabilizer (STAB), Storage Tanks (TK-01 – TK-012))

8.1. Limitations and Standards

8.1.1. The condensate stabilizer (STAB) overheads will normally be captured by a vapor recovery unit and routed to the facility inlet. However, for operating flexibility and during maintenance activities, the stabilizer overheads may be sent to the flare (APCFLARE) for up to 120 hours per year. This shall be operated in compliance with permit condition 6.1.4.

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		OH-1
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
OH-1	**Hot Oil Heater**	**na**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Natural Gas Fired Hot Oil Heater (Stabilizes Condensate)

Manufacturer:	**Model number:**	**Serial number(s):**
na	**na**	**na**
Construction date:	**Installation date:**	**Modification date(s):**
na	**2010**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

3.35 MMBtu/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
na	**na**	**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 _X_ Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
3.35 MMBtu/hr	**3.35**

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 3,284 scf/hr 28.77 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	<0.01%	negligible	1,020 Btu/scf

Emission Unit Description		OH-1
Criteria Pollutants	**Pollutant Emissions**	
	PPH (each)	**TPY (each)**
Carbon Monoxide (CO)	**0.28**	**1.21**
Nitrogen Oxides (NOX)	**0.33**	**1.44**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**0.02**	**0.11**
Particulate Matter (PM10)	**0.02**	**0.11**
Total Particulate Matter (TSP)	**0.02**	**0.11**
Sulfur Dioxide (SO2)	**2E-03**	**0.01**
Volatile Organic Compounds (VOC)	**0.02**	**0.08**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH (each)	**TPY (each)**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**7E-06**	**3E-05**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**---**	**---**
Formaldehyde	**2E-04**	**1E-03**
Hexane, n-	**0.01**	**0.03**
Methanol	**---**	**---**
POM/PAH	**2E-06**	**1E-05**
Toluene	**1E-05**	**5E-05**
TMP, 2,2,4-	**---**	**---**
Xylenes	**---**	**---**
Other/Trace HAP	**4E-06**	**2E-05**
Total HAP	**0.01**	**0.03**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH (each)	**TPY (each)**
Carbon Dioxide (CO2)	**391.87**	**1,716**
Methane (CH4) (GWP=25)	**0.01**	**0.03**
Nitrous Oxide (N2O) (GWP=298)	**7E-04**	**3E-03**
CO2 Equivalent (CO2e)	**392.28**	**1,718**

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.).

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Please reference Supplement S3 - Emission Calculations

Emission Unit Description **OH-1**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

10.0. Source-Specific Requirements (Reboilers, Heater Treaters)

10.1. Limitations and Standards

10.1.1. Maximum Design Heat Input. The maximum design heat input (MDHI) shall not exceed the following:

Emission Unit ID#	Emission Unit Description	MDHI (MMBTU/hr)
EURBL-1	Glycol Dehydration Reboiler	1.0
EURBL-2	Glycol Dehydration Reboiler	1.0
EURBL-3	Glycol Dehydration Reboiler	1.0
EUHT-1	Heater Treater	1.0
EUHT-2	Heater Treater	1.0

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		TK-01 thru TK-10 (total)
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
TK-01 thru TK-10 (total)	**Ten (10) Stabilized Condensate Storage Tanks**	**VRU**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Ten (10) 400 bbl storage tanks are used to hold the Stabilized Condensate (SC) from the stabilizer. Gas vapors from these tanks are routed to a Vapor Recovery Unit (VRU) with a control efficiency of 98%.

Manufacturer:	**Model number:**	**Serial number(s):**
na	**na**	**na**
Construction date:	**Installation date:**	**Modification date(s):**
na	**2010**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

4,000 bbl (Total)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
31.25 bbl/hr (Total)	**273,750 bbl/yr (Total)**	**8,760 hr/yr (each)**

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ___ Yes _X_No	**If yes, is it? ___ Indirect ___ Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	**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 Unit Description	**TK-01 thru TK-10 (total)**	
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**---**	**---**
Nitrogen Oxides (NOX)	**---**	**---**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**---**	**---**
Particulate Matter (PM10)	**---**	**---**
Total Particulate Matter (TSP)	**---**	**---**
Sulfur Dioxide (SO2)	**---**	**---**
Volatile Organic Compounds (VOC)	**0.25**	**1.11**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**1E-04**	**5E-04**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**3E-03**	**0.01**
Formaldehyde	**---**	**---**
Hexane, n-	**0.01**	**0.05**
Methanol	**---**	**4E-04**
POM/PAH	**---**	**---**
Toluene	**2E-03**	**0.01**
TMP, 2,2,4-	**1E-03**	**5E-03**
Xylenes	**4E-03**	**0.02**
Other/Trace HAP	**---**	**---**
Total HAP	**0.02**	**0.10**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**0.05**	**0.23**
Methane (CH4) (GWP=25)	**0.05**	**0.22**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**1.30**	**5.69**

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.).

EPA TANKS 4.0.9(d)

Please reference Supplement S3 - Emission Calculations
also Supplement S6 - Emission Programs

Emission Unit Description	**TK-01 thru TK-10 (total)**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

8.1.2. The maximum combined annual throughput of liquids to the storage tanks shall not exceed the following:

Tank ID	Material Stored	Maximum Annual Throughput (bbl/yr)
TK-01-10	Stabilized Condensate	273,750 (aggregate)
WTK-11-12	Produced Fluid/Water	36,500 (aggregate

Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the throughput at any given time during the previous twelve consecutive calendar months.

8.1.3. Maximum emissions from the storage tank battery (TK-01 – TK-12) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	0.27	1.21

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		WTK-11 and WTK-12 (total)
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
WTK-11 and WTK-12 (total)	Two (2) Produced Water Storage Tanks	VRU

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Two (2) 400 bbl Produced Water (PW) storage tanks are used to hold the produced water from the inlet separators and the dehydrators. Gas vapors from these tanks are routed to a Vapor Recovery Unit (VRU) with a control efficiency of 98%.

Manufacturer:	Model number:	Serial number(s):
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2010	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

800 bbl (Total)

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule:
4.17 bbl/hr (Total)	36,500 bbl/yr (Total)	8,760 hr/yr (each)

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ___ Yes _X_No	If yes, is it? ___ Indirect ___ Direct
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	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 Unit Description	**WTK-11 and WTK-12 (total)**	
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**---**	**---**
Nitrogen Oxides (NOX)	**---**	**---**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**---**	**---**
Particulate Matter (PM10)	**---**	**---**
Total Particulate Matter (TSP)	**---**	**---**
Sulfur Dioxide (SO2)	**---**	**---**
Volatile Organic Compounds (VOC)	**0.02**	**0.10**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**1E-05**	**5E-05**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**3E-04**	**1E-03**
Formaldehyde	**---**	**---**
Hexane, n-	**1E-03**	**5E-03**
Methanol	**---**	**3E-05**
POM/PAH	**---**	**---**
Toluene	**1E-04**	**6E-04**
TMP, 2,2,4-	**1E-04**	**4E-04**
Xylenes	**4E-04**	**2E-03**
Other/Trace HAP	**---**	**---**
Total HAP	**2E-03**	**0.01**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**---**	**---**
Methane (CH4) (GWP=25)	**---**	**---**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
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.).

EPA TANKS 4.0.9(d)

Please reference Supplement S3 - Emission Calculations
also Supplement S6 - Emission Programs

Emission Unit Description	**WTK-11 and WTK-12 (total)**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

8.1.2. The maximum combined annual throughput of liquids to the storage tanks shall not exceed the following:

Tank ID	Material Stored	Maximum Annual Throughput (bbl/yr)
TK-01-10	Stabilized Condensate	273,750 (aggregate)
WTK-11-12	Produced Fluid/Water	36,500 (aggregate

Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the throughput at any given time during the previous twelve consecutive calendar months.

8.1.3. Maximum emissions from the storage tank battery (TK-01 – TK-12) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	0.27	1.21

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		LOR
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
LOR	**Stabilized Condensate Truck Load-Out**	**CarbCan**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Loading of Stabilized Condensate (SC) a into tanker trucks occur at the facility. Gas vapors from these operations are routed to a Carbon Canisters (CarbCan) with an overall control efficiency of 66.5%.

Manufacturer:	**Model number:**	**Serial number(s):**
na	**na**	**na**
Construction date:	**Installation date:**	**Modification date(s):**
na	**2010**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

na

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
31.25 bbl/hr (Ave)	**273,750 bbl/yr**	**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 ___ Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	**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 Unit Description		**LOR**
Criteria Pollutants	**Pollutant Emissions**	
	PPH (ave)	**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)	**3.05**	**13.34**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH (ave)	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**9E-04**	**4E-03**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**9E-04**	**4E-03**
Formaldehyde	**---**	**---**
Hexane, n-	**0.03**	**0.15**
Methanol	**---**	**4E-03**
POM/PAH	**---**	**---**
Toluene	**9E-04**	**4E-03**
TMP, 2,2,4-	**0.01**	**0.03**
Xylenes	**9E-04**	**4E-03**
Other/Trace HAP	**---**	**---**
Total HAP	**0.04**	**0.20**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH (ave)	**TPY**
Carbon Dioxide (CO2)	**---**	**---**
Methane (CH4) (GWP=25)	**---**	**---**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
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.).

EPA AP-42

Please reference Supplement S3 - Emission Calculations

Emission Unit Description **LOR**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

9.0. Source-Specific Requirements (Truck Loading, EPLOR)

9.1. Limitations and Standards

9.1.1. The maximum combined annual throughput of liquids to the storage tanks shall not exceed the following:

Loadout ID	Material Stored	Maximum Annual Throughput (bbl/yr)
LOR	Stabilized Condensate	273,750 (aggregate)
WLOR	Produced Fluid/Water	36,500 (aggregate)

Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the throughput at any given time during the previous twelve consecutive calendar months.

9.1.2. Maximum emissions from the product loadout rack (EPLOR) shall not exceed the following limits:

Pollutant	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	13.52
Total Hazardous Air Pollutants	0.21

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		WLOR
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
WLOR	Produced Water Truck Load-Out	CarbCan

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Loading of produced water into tanker trucks occur at the facility.

Manufacturer:	Model number:	Serial number(s):
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2010	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

na

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule:
4.17 bbl/hr (Ave)	36,500 bbl/yr	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 ___ Direct
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	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 Unit Description		WLOR
Criteria Pollutants	**Pollutant Emissions**	
	PPH (ave)	**TPY**
Carbon Monoxide (CO)	---	---
Nitrogen Oxides (NOX)	---	---
Lead (Pb)	---	---
Particulate Matter (PM2.5)	---	---
Particulate Matter (PM10)	---	---
Total Particulate Matter (TSP)	---	---
Sulfur Dioxide (SO2)	---	---
Volatile Organic Compounds (VOC)	**0.04**	**0.18**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH (ave)	**TPY**
Acetaldehyde	---	---
Acrolein	---	---
Benzene	**1E-05**	**5E-05**
Butadiene, 1,3-	---	---
Ethylbenzene	**1E-05**	**5E-05**
Formaldehyde	---	---
Hexane, n-	**5E-05**	**2E-04**
Methanol	---	**5E-06**
POM/PAH	---	---
Toluene	**1E-06**	**5E-06**
TMP, 2,2,4-	**9E-06**	**4E-05**
Xylenes	**1E-06**	**5E-06**
Other/Trace HAP	---	---
Total HAP	**6E-05**	**3E-04**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH (ave)	**TPY**
Carbon Dioxide (CO2)	---	---
Methane (CH4) (GWP=25)	---	---
Nitrous Oxide (N2O) (GWP=298)	---	---
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.).

AP-42

Please reference Supplement S3 - Emission Calculations

Emission Unit Description **WLOR**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

9.0. Source-Specific Requirements (Truck Loading, EPLOR)

9.1. Limitations and Standards

9.1.1. The maximum combined annual throughput of liquids to the storage tanks shall not exceed the following:

Loadout ID	Material Stored	Maximum Annual Throughput (bbl/yr)
LOR	Stabilized Condensate	273,750 (aggregate)
WLOR	Produced Fluid/Water	36,500 (aggregate)

Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the throughput at any given time during the previous twelve consecutive calendar months.

9.1.2. Maximum emissions from the product loadout rack (EPLOR) shall not exceed the following limits:

Pollutant	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	13.52
Total Hazardous Air Pollutants	0.21

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		PIG
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
PIG	**Pigging Operations Six (6) Pig Traps**	**na**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Emissions from pigging operations result from releases of gas vapor in the pig launcher/receiver for removal of the pig. Gas vapors from the pigging operations are vented to the atmosphere

Manufacturer:	**Model number:**	**Serial number(s):**
na	**na**	**na**
Construction date:	**Installation date:**	**Modification date(s):**
na	**2010**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

na

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
na	**na**	**na**

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? ___ Yes _X_No	**If yes, is it? ___ Indirect ___ Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	**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 Unit Description		**PIG**
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**---**	**---**
Nitrogen Oxides (NOX)	**---**	**---**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**---**	**---**
Particulate Matter (PM10)	**---**	**---**
Total Particulate Matter (TSP)	**---**	**---**
Sulfur Dioxide (SO2)	**---**	**---**
Volatile Organic Compounds (VOC)	**0.14**	**0.63**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**4E-04**	**2E-03**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**4E-04**	**2E-03**
Formaldehyde	**---**	**---**
Hexane, n-	**2E-03**	**0.01**
Methanol	**---**	**---**
POM/PAH	**---**	**---**
Toluene	**4E-04**	**2E-03**
TMP, 2,2,4-	**4E-04**	**2E-03**
Xylenes	**4E-04**	**2E-03**
Other/Trace HAP	**---**	**---**
Total HAP	**0.01**	**0.03**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**1E-03**	**5E-03**
Methane (CH4) (GWP=25)	**0.16**	**0.69**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**3.96**	**17.36**

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.).

Mass balance and engineering judgment

Please reference Supplement S3 - Emission Calculations

Emission Unit Description **PIG**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

13.0. Source-Specific Requirements (Compressor Blowdowns, Pigging Operations)

13.1. Limitations and Standards

13.1.2. The maximum number of pigging events per year shall not exceed 208, with an estimated 133 Mscf per year. Compliance shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the wet gas pigging events at any given time during the previous twelve consecutive calendar months.

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		**FUG-G**
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
FUG-G	**Process Piping and Equipment Leaks – Gas (FUG-G)**	**na**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Process Piping and Equipment leaks includes 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.

Manufacturer:	**Model number:**	**Serial number(s):**
na	**na**	**na**
Construction date:	**Installation date:**	**Modification date(s):**
na	**2010**	**na**

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

na

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
na	**na**	**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 ___ Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	**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 Unit Description		**FUG-G**
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**---**	**---**
Nitrogen Oxides (NOX)	**---**	**---**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**---**	**---**
Particulate Matter (PM10)	**---**	**---**
Total Particulate Matter (TSP)	**---**	**---**
Sulfur Dioxide (SO2)	**---**	**---**
Volatile Organic Compounds (VOC)	**0.73**	**3.19**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**2E-03**	**0.01**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**2E-03**	**0.01**
Formaldehyde	**---**	**---**
Hexane, n-	**0.01**	**0.05**
Methanol	**---**	**---**
POM/PAH	**---**	**---**
Toluene	**2E-03**	**0.01**
TMP, 2,2,4-	**2E-03**	**0.01**
Xylenes	**2E-03**	**0.01**
Other/Trace HAP	**---**	**---**
Total HAP	**0.03**	**0.14**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**0.03**	**0.12**
Methane (CH4) (GWP=25)	**3.53**	**15.47**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**88.34**	**386.93**

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.).

EPA Emission Factors

Please reference Supplement S3 - Emission Calculations

Emission Unit Description **FUG-G**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

14.0. Source-Specific Requirements (40CFR60 Subpart OOOOa Requirements, Fugitive Emission Components)

14.1. Limitations and Standards

14.1.1. For each affected facility under §60.5365a(j), you must reduce GHG (in the form of a limitation on emissions of methane) and VOC emissions by complying with the requirements of paragraphs (a) through (j) of this section. These requirements are independent of the closed vent system and cover requirements in §60.5411a.

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment E - Emission Unit Form

Emission Unit Description		FUG-L
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
FUG-L	**Process Piping and Equipment Leaks – Liquid (FUG-L)**	**na**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Process Piping and Equipment leaks includes 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.

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, boilers – MMBtu/hr, engines - hp):

na

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
na	**na**	**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 ___ Direct**
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
na	**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 Unit Description		**FUG-L**
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**---**	**---**
Nitrogen Oxides (NOX)	**---**	**---**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**---**	**---**
Particulate Matter (PM10)	**---**	**---**
Total Particulate Matter (TSP)	**---**	**---**
Sulfur Dioxide (SO2)	**---**	**---**
Volatile Organic Compounds (VOC)	**1.36**	**5.97**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**7E-04**	**3E-03**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**0.02**	**0.08**
Formaldehyde	**---**	**---**
Hexane, n-	**0.06**	**0.28**
Methanol	**---**	**---**
POM/PAH	**---**	**---**
Toluene	**0.01**	**0.04**
TMP, 2,2,4-	**0.01**	**0.03**
Xylenes	**0.02**	**0.10**
Other/Trace HAP	**---**	**---**
Total HAP	**0.12**	**0.52**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**---**	**---**
Methane (CH4) (GWP=25)	**---**	**---**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
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.).

EPA Emission Factors

Please reference Supplement S3 - Emission Calculations

Emission Unit Description **FUG-L**

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.

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

14.0. Source-Specific Requirements (40CFR60 Subpart OOOOa Requirements, Fugitive Emission Components)

14.1. Limitations and Standards

14.1.1. For each affected facility under §60.5365a(j), you must reduce GHG (in the form of a limitation on emissions of methane) and VOC emissions by complying with the requirements of paragraphs (a) through (j) of this section. These requirements are independent of the closed vent system and cover requirements in §60.5411a.

_X_ Permit Shield

For all applicable requirements listed above, provide <u>monitoring/testing/recordkeeping/reporting</u> 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.)

Please Reference WVDEP-DAQ Permit R13-2831F
(Also SUPPLEMENT S2 – Regulatory Discussion)

There are no requested changes

Are you in compliance with all applicable requirements for this emissions unit? ☑ **Yes** ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**. **(Not Applicable)**

Attachment F
Schedule of Compliance
(Not Applicable)

"26b. For each emission unit not in compliance with an applicable requirement, fill out a Schedule of Compliance Form as ATTACHMENT F."

- **Schedule of Compliance Form – Not Applicable**

Attachment F

NOT APPLICABLE

Schedule of Compliance Form

ATTACHMENT F - Schedule of Compliance Form

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

1. Applicable Requirement

Unit(s):	**Applicable Requirement:**

2. Reason for Noncompliance:

3. How will Compliance be Achieved?

4. Consent Order Number (if applicable):

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.

Remedial Measure or Action	Date to be Achieved

6. Submittal of Progress Reports.

Content of Progress Report:	**Report starting date:** MM/DD/YYYY **Submittal frequency:**

Attachment G

Air Pollution Control Device Forms

"27a. For each control device listed in the Title V Equipment Table, fill out and provide an Air Pollution Control Device Form as ATTACHMENT G. ."

- **Non-Selective Catalyst (NSCR-02 and NSCR-04) (Serves CE-02 and CE-04)**
- **Non-Selective Catalyst (NSCR-03, 05 & 06) (Serves CE-03, CE-05 and CE-06)**
- **Oxidation Catalyst (OxCat-07, -08, 12-15) (Serves CE-07, -08, 12-15)**
- **Condenser and Burner Management System (BMS) (BTEX-01 thru BTEX-03) (Serves DHY-01 thru DHY-03)**
- **Vapor Recovery Unit (VRU) (Serves TK-01 thru TK-10 and WTK-11 and WTK-12)**
- **Carbon Canister (CarbCan) (Serves TLO and WTLO)**
- **Dehydrator/Stabilizer Flare (Serves DHY-01 thru DHY-03 and STAB)**

Appalachia Midstream Services, LLC (AMS)

Miller Compressor Station

Application for 45CSR30 Title V Operating Permit

Attachment G

Air Pollution Control Device Form

Emission Unit Description		**NSCR-02 and NSCR-04**
Control device ID number:	**List all emission units associated with this control device.**	
NSCR-02 and NSCR-04	**CE-02 and CE-04**	
Manufacturer:	**Model Number:**	**Installation Date:**
Miratech	**RHS2-4836-18**	**2023**

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	___ Flare	_X_ **Other: Non-Selective Catalyst**
___ 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	**100%**	**97.4%**
CO	**100%**	**93.9%**
VOC	**100%**	**86.7%**
HCHO	**100%**	**76.0%**

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

Design Flow Rate: **520,020 scf/hr** **1,136 ^{o}F**

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: **Subject to NSPS JJJJ**

Supplement S3 - Emission Calculations and Supplement S5 Vendor Data.

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

Supplement S3 - Emission Calculations and Supplement S5 Vendor Data.

Attachment G

Air Pollution Control Device Form

Emission Unit Description		**NSCR-03, -05 & -06**
Control device ID number:	**List all emission units associated with this control device.**	
NSCR-03, -05 & -06	**CE-03, CE-05 and CE-06**	
Manufacturer:	**Model Number:**	**Installation Date:**
Miratech	**RHS2-4836-18**	**2010**

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	___ Flare	_X_ **Other: Non-Selective Catalyst**
___ 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	**100%**	**96.5%**
CO	**100%**	**93.3%**
VOC	**100%**	**84.5%**
HCHO	**100%**	**84.5%**

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

Design Flow Rate: **391,500 scf/hr** **1,149 ^{o}F**

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: **Subject to NSPS JJJJ**

Supplement S3 - Emission Calculations and Supplement S5 Vendor Data.

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

Supplement S3 - Emission Calculations and Supplement S5 Vendor Data.

Appalachia Midstream Services, LLC (AMS)

Miller Compressor Station

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Attachment G

Air Pollution Control Device Form

Emission Unit Description		**OxCat-08 & OxCat-12-15**
Control device ID number:	**List all emission units associated with this control device.**	
OxCat-08 & OxCat-12-15	**CE-08, CE-12 thru CE-15**	
Manufacturer:	**Model Number:**	**Installation Date:**
EMIT Technologies	**ELH-4200-1616F-4CEE-242**	**2012 & 2017**

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	___ Flare	**_X_ Other: Oxidation Catalyst**
___ 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	**100%**	**---**
CO	**100%**	**81.5%**
VOC	**100%**	**59.3%**
HCHO	**100%**	**76.0%**

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

Design Flow Rate: **549,360 scf/hr** **995 ^{o}F**

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: **Subject to NSPS JJJJ**

Supplement S3 - Emission Calculations and Supplement S5 Vendor Data.

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

Supplement S3 - Emission Calculations and Supplement S5 Vendor Data.

Appalachia Midstream Services, LLC (AMS)

Miller Compressor Station

Application for 45CSR30 Title V Operating Permit

Attachment G

Air Pollution Control Device Form

Emission Unit Description		**BTEX-01 thru BTEX-03 (each)**
Control device ID number:	**List all emission units associated with this control device.**	
BTEX-01 thru BTEX-03 (each)	**DHY-01 thru DHY-03 (each)**	
Manufacturer:	**Model Number:**	**Installation Date:**
Cameron	**BTEX Buster**	**2010**

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	_X_ **Condenser**	___ Settling Chamber
___ Thermal Incinerator	___ Flare	_X_ **Other: Burner Mgt System (BMS)**
___ 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
Volatile Organic Compounds	**100%**	**99.3%**
V-HAP	**100%**	**99.7%**
Methane	**100%**	**98.1%**

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

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

If Yes, Complete Attachment H

If No, Provide justification: na

See Attachment H - Compliance Assurance Monitoring (CAM),
Supplement S3 - Emission Calculations, and
Supplement S5 - Vendor Data.

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

See Attachment H - Compliance Assurance Monitoring (CAM),
Supplement S3 - Emission Calculations, and
Supplement S5 - Vendor Data.

Air Pollution Control Device Form

Emission Unit Description		**VRU**
Control device ID number:	**List all emission units associated with this control device.**	
VRU	**TK-01 thru TK-10, and WTK-11 and WTK-12**	
Manufacturer:	**Model Number:**	**Installation Date:**
Catalytic Combustion Emission Tech	**Folded Metal Foil-HFX1**	**2010**

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	___ Flare	_X_ **Other: Vapor Reecovery Unit**
___ 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
VOC	**100%**	**98.0%**
VHAP	**100%**	**98.0%**

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

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: Pre-Control Potential VOC Emissions are Less Than 100 tpy

Supplement S3 - Emission Calculations and Supplement S5 Vendor Data.

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

Supplement S3 - Emission Calculations and Supplement S5 Vendor Data.

Appalachia Midstream Services, LLC (AMS)

Miller Compressor Station

Application for 45CSR30 Title V Operating Permit

Attachment G

Air Pollution Control Device Form

Emission Unit Description		**CarbCan**
Control device ID number:	**List all emission units associated with this control device.**	
CarbCan	**LOR**	
Manufacturer:	**Model Number:**	**Installation Date:**
na	**na**	**2010**

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multicyclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
_X_ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other: _____
___ 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
VOC	**70%**	**95.0%**
VHAP	**70%**	**95.0%**

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

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: Pre-Control Potential VOC Emissions are Less Than 100 tpy

Supplement S3 - Emission Calculations and Supplement S5 Vendor Data.

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

Prior to the loading of each truck, the saturation indicator on the carbon canister (APC-CARBON) must be checked to ensure that the carbon is not spent. If the saturation indicator demonstrates that the carbon is spent, no truck loading is allowed.

Attachment H

Compliance Assurance Monitoring (CAM) Forms

"27b. 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."

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

Per § 64.5(b), CAM plan is due with renewal application.

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.

BASIS OF CAM SUBMITTAL

2) Mark the appropriate box below as to why this CAM plan is being submitted as part of an application for a Title V permit:

☐ RENEWAL APPLICATION. **ALL** PSEUs for which a CAM plan has NOT yet been approved need to be addressed in this CAM plan submittal.

☐ INITIAL APPLICATION (submitted after 4/20/98). **ONLY** large PSEUs (i. e., PSEUs with potential post-control device emissions of an applicable regulated air pollutant that are equal to or greater than Major Source Threshold Levels) need to be addressed in this CAM plan submittal.

☐ SIGNIFICANT MODIFICATION TO LARGE PSEUs. **ONLY** large PSEUs being modified after 4/20/98 need to be addressed in this cam plan submittal. For large PSEUs with an approved CAM plan, Only address the appropriate monitoring requirements affected by the significant modification.

Supplement S1
Process Description

"14. Provide a general description of operations."

- **Process Description**

Supplement S1

Process Description

Project Overview

Appalachia Midstream Services, LLC (AMS) is submitting an application for 45CSR30 Title V Operating Permit for the existing Miller Compressor Station located at 1779 Johnson Ridge (aka, Wetzel County Road 1/22), in Wetzel and Marshall Counties, West Virginia.

The facility receives low-pressure “wet” natural gas from local production wells via pipeline then compresses and dehydrates the gas for delivery of high pressure “dry” natural gas via pipeline. Additionally, raw condensate and produced fluid/water are stabilized (i.e., vapor pressure reduction), and then sent off-site via tanker trucks.

Please reference Attachment C – Process Flow Diagram (PFD).

Pigging Operations (PIG)

Pigging is a process in pipeline maintenance that involves the use of devices known as pigs, which clean pipelines and are capable of checking pipeline condition. A pig is inserted into the pipeline using a pig launcher and is removed from the pipeline using a pig receiver. Emissions from the Pigging Operations (PIG) are vented to the atmosphere.

Inlet Filters/Separators

All inlet natural gas is routed through the Inlet/Filters/Separators. The condensate and produced fluid/water generated from this operation are routed to the Condensate Stabilizer Feed Drum. The inlet filters/separators are totally enclosed processes with no emissions vented to the atmosphere.

Compressor Engines (CE-02 thru CE-06, CE-07, CE-08, and CE-12 thru CE-15)

Eleven (11) natural gas-fueled reciprocating engines. Each engine drives a natural gas compressor to increase the pressure of the natural gas. Each engine is equipped with either Non-Selective Catalytic Reduction (NSCR) or Oxidation Catalyst (OxCat), as applicable, to control emissions from fuel combustion.

Compressor Blowdown/Emergency Shutdown Testing (BD)

As part of normal facility operation, the compressor engines will undergo periods of startup and shutdown. When an engine is shutdown, the natural gas contained within the compressor and associated piping is evacuated. Additionally, there will be other infrequent emissions from various maintenance activities, such as emergency shutdown testing. Emissions from Compressor Blowdown/Emergency Shutdown Testing (BD) are vented to the atmosphere.

Compressor Rod Packing Leaks (CRP)

The reciprocating compressor operations result in natural gas emissions from the mechanical seals around the piston rods. Emissions from Compressor Rod Packing (CRP) are vented to the atmosphere.

Engine Crankcase Emissions (ECC)

Internal combustion results in a small but continual amount of blow-by, which occurs when some of the gases from combustion leak past the crankcase piston rings. Emissions from Engine Crankcase (ECC) are vented to the atmosphere.

Microturbine Generator (GEN-01)

Electric power is generated by a natural-gas-fired microturbine generator. The combustion emissions from the Microturbine (GEN-01) are vented to the atmosphere.

Dehydrators (STL-01 thru STL-03)

Three (3) Dehydrators are utilized to remove water vapor from the natural gas inlet stream. Each dehydrator is comprised of a Contactor/Absorber Tower (no vented emissions), a Flash Tank, and a Regenerator/Still Vent with a Condenser.

The wet inlet gas stream flows through a contactor tower where the gas is contacted with lean glycol. The lean glycol absorbs the water in the gas stream and becomes rich glycol, ladened with water and trace amounts of hydrocarbons.

The rich glycol is then routed to a flash tank where the pressure is reduced to liberate the lighter end hydrocarbons (primarily methane (CH4)). These lighter end hydrocarbons are routed to the reboiler for use as fuel, to the compressor suction for reclamation, and with any excess hydrocarbons routed to the STL/STAB Flare (FLR).

The rich glycol is then routed to the regenerator/still where it is heated to drive off the water vapor and any remaining hydrocarbons. The lean glycol is then recirculated through the contactor tower to absorb the water in the gas stream.

The regenerator/still overhead gases are then processed through a condenser. The condensed liquids (primarily water) are routed to the produced fluid/water storage tank. The condenser overhead gases are routed to the reboiler for use as fuel.

Reboilers (RBL-01 thru RBL-03)

Three (3) gas-fueled reboilers are utilized to supply heat to the Regenerator/Still. The combustion emissions from the Reboilers (RBL-01 thru RBL-03) are vented to the atmosphere.

Condensate Filter Feed Drum

The Condensate Filter Feed Drum removes produced fluids/water from the raw condensate. The produced fluid/water is routed to the Produced Fluid/Water Storage Tanks (WTK-11 and WTK-12). The raw condensate is routed to the Condensate Stabilizer (STAB). The Condensate Filter Feed Drum is a totally enclosed process with no emissions vented to the atmosphere. Feed drum overheads are routed to the process VRUs and to flare if the VRUs are unavailable.

Condensate Stabilizer By-Pass (STAB)

The condensate stabilizer uses hot oil to heat the raw condensate and drive off the high volatility components. The stabilized condensate is routed to the Stabilized Condensate Storage Tanks (TK-01 thru TK-10) and the overheads are routed to the compressor suction to reclaim the natural gas. However, during upsets and maintenance, the Condensate Stabilizer By-Pass (STAB) routes the overheads to the STL/STAB Flare (FLR).

Hot Oil Heater (OH-01)

A hot oil heater is utilized to supply heat to the condensate stabilizer. The combustion emissions from the Hot Oil Heater (OH-01) are vented to the atmosphere.

Stabilized Condensate Storage Tanks (TK-01 thru TK-10)

Ten (10) 400 bbl storage tanks hold the stabilized condensate from the condensate stabilizer. Gas vapors from the Stabilized Condensate Storage Tanks (TK-01 thru TK-10) are routed to the Vapor Recovery Unit (VRU). However, during upsets and maintenance of the VRU, emissions from the storage tanks may be vented to the atmosphere.

Produced Fluid/Water Storage Tanks (WTK-11 and WTK-12)

Two (2) 400 bbl storage tanks to hold the produced fluid/water from the inlet separator and the dehydrators. Gas vapors from the Produced Fluid/Water Storage Tanks (WTK-11 and WTK-12) are routed to the Vapor Recovery Unit (VRU). However, during upsets and maintenance of the VRU, emissions from the storage tanks may be vented to the atmosphere.

Misc. Storage Tanks

There are also tanks at the facility used to store various materials, including fresh and used lube oil, fresh and spent glycol, methanol, etc. Each of these Misc. Storage Tanks generate de-minimis (insignificant) emissions.

Vapor Recovery Unit (VRU)

Gas vapors from the Stabilized Condensate Storage Tanks (TK-01 thru TK-10) and Produced Fluid/Water Storage Tanks (WTK-11 and WTK-12) are gathered by an electric motor driven vapor recovery unit. The VRU discharges to the compressor suction to reclaim the natural gas.

Truck Load-Out (LOR and WLOR)

Gas vapor from Truck Load-out (LOR and WLOR) operations are routed to the Activated Carbon Cannisters to control CH4, VOC and HAP emissions.

STL/STAB Flare (FLR)

One (1) STL/STAB Flare (FLR) is used to control emissions from the Dehydrators (STL-01 thru STL-03) and from the Condensate Stabilizer By-Pass (STAB).

Piping and Equipment Fugitives (FUG-G and FUG-L)

Piping and process equipment generate from leaks from different component types (connectors, valves, pumps, etc.) in gas-vapor service and light-liquid (condensate) service. These emissions are controlled by implementation of an effective “Leak Detection and Repair (LDAR)” protocol.

Supplement S2

Regulatory Discussion

"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 the shield applies."

"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."

- **Regulatory Discussion**
  - A. Potential to Emit (PTE)
  - B. Applicability of New Source Performance Standards (NSPS)
  - C. Applicability of National Emission Standards for Hazardous Air Pollutants (NESHAP)
  - D. Compliance Assurance Monitoring (CAM)
  - E. Chemical Accident Prevention Provisions (Risk Management Plan (RMP))
  - F. Mandatory Greenhouse Gas Reporting (GHGRP)
  - G. Applicability of State Regulations

Appalachia Midstream Services, LLC
Miller Compressor Station
Application for 45CSR30 Title V Operating Permit

Supplement S2
Regulatory Discussion

A. Potential-to-Emit (PTE) (Major Source Classification)
40CFR§50.1-§50.19

1. Non-Attainment New Source Review (NNSR)
40CFR§51.165 [Not Applicable]

This rule does not apply. The facility is in Wetzel and Marshall Counties, WV, which are currently classified as Attainment, Unclassified, or Maintenance for all national ambient air quality standards (www3.epa.gov/airquality/greenbook/anayo_wv.html).

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

This rule does apply. The AMS-Miller Compressor Station is a Major Source of Criteria Pollutants (i.e., CO and VOC); and therefore, subject to the Title V Operating Permit (TVOP) regulations (45CSR30); as follows:

- NOx: Title V Natural Minor Source with Pre-Controlled PTE less than 100 tpy
- **CO: Title V Major Source with Controlled PTE greater than 100 tpy**
- **VOC: Title V Major Source with Controlled PTE greater than 100 tpy**
- PM10/2.5 Title V Natural Minor Source with Pre-Controlled PTE less than 100 tpy
- SO2: Title V Natural Minor Source with Pre-Controlled PTE less than 100 tpy
- Each HAP: Title V Synthetic Minor (Area) Source with Controlled PTE less than 10 tpy
- Total HAPs: Title V Synthetic Minor (Area) Source with Controlled PTE less than 25 tpy
- GHG: Not Applicable for TVOP Major Source determination

Important Notes:

* Criteria pollutant fugitive emissions **are not included** in TVOP major source determinations because the facility is not a listed source category.
* Hazardous air pollutant (HAP) fugitive emissions **are included** in TVOP major source determinations regardless of whether the facility is a listed source category.
* Greenhouse gases (GHG) **are not included** in TVOP major source determinations.

3. Major Source of Hazardous Air Pollutants (HAPs)
40CFR§63.1-§63.16 [Not Applicable]

This rule does not apply because the subject facility qualifies as a "HAP Area Source" as follows:

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

Important Note:

* Hazardous air pollutant (HAP) fugitive emissions are included in HAP Major Source determinations (§63.2).

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

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

- NOx: PSD Synthetic Minor Source with Controlled PTE less than 250 tpy
- CO: PSD Synthetic Minor Source with Controlled PTE less than 250 tpy
- VOC: PSD Synthetic Minor Source with Controlled PTE less than 250 tpy
- PM10/2.5: PSD Natural Minor Source with Pre-Controlled PTE less than 250 tpy
- SO2: PSD Natural Minor Source with Pre-Controlled PTE less than 250 tpy
- CO2e: Not Applicable for PSD Major Source determination

Important Notes:

* Criteria pollutant fugitive emissions are not included in PSD Major Source determinations because the subject facility is not a "listed source" category (§52.21(b)(1)(iii)).
* Greenhouse gases (GHG/CO2e) are not treated as air pollutants for PSD Major Source determinations; however, GHG/CO2e must be included in the permit if potential emissions exceed 100,000 tpy and the facility is "otherwise" subject to PSD requirements (US Supreme Court, No. 12-1146, June 23, 2014).
* The designation of PSD Major Source status is determined on a pollutant specific basis; however, if a facility exceeds a PSD Major Source threshold for a single NSR regulated pollutant, it becomes PSD Major Source for any other regulated NSR pollutant emitted at or above its significant level, regardless of whether that pollutant exceeds the major stationary source threshold.
* A PSD Major Modification is a change at an existing PSD Major Source which would result in both a significant emission increase and a significant net emission increase of any regulated pollutant.

B. Applicability of New Source Performance Standards (NSPS)

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

1. NSPS A, General Provisions

40CFR§60.1-§60.19 [Applicable]

This rule does apply to the Compressor Engines (CE-02 thru CE-08 and CE-12 thru CE-15) because they are subject to NSPS JJJJ – Stationary Spark Ignition (SI) Internal Combustion Engines (ICE). (See Section B.9. below.)

This rule does apply to the facility because it is subject to NSPS OOOOa – Crude Oil and Natural Gas Production, Transmission and Distribution. (See Section B.12. below.)

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. Control Device and Work Practices (§60.18)
f. Notification and Reporting (§60.19)

2. **NSPS A, Control Devices - Flares**
   40CFR§60.18(b) [Not Applicable]

   This rule does not apply to the to the STL/STAB Flare (FLR) because it is not used to comply with applicable subparts of 40CFR§60 or §61 (40CFR§60.18(a)(1)).

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

   These rules do not apply because there are no steam generating units (including line heaters) at the facility with a maximum design heat input capacity equal to or greater than 10 MMBtu/hr (§60.40c(a)).

4. **NSPS K (also Ka and Kb), Volatile Organic Liquid Storage Vessels**
   40CFR§60.40-§60.48 [Not Applicable]

   This rule does not apply because there is no Storage Vessel/Tank with capacity equal to or greater than 75 m3 (471.7 bbl or 19,813 gal) that is used to store volatile organic liquids (VOL) at the facility (§60.110(a)).

5. **NSPS GG, Stationary Gas Turbines**
   40CFR§60.330-§60.335 [Not Applicable]

   This rule does not apply because there are no stationary gas turbines at the facility with heat input at peak load equal to or greater than 10.7 gigajoules (10 million Btu) per hour, based on the lower heating value of the fuel fired (§60.330).

6. **NSPS KKK, Leaks from Natural Gas Processing Plants**
   40CFR§60.630-§60.636 [Not Applicable]

   This rule does not apply because the facility is not a natural gas processing plant (§60.630(a)).

7. **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)).

8. **NSPS IIII, Compression Ignition Reciprocating Internal Combustion Engines**
   40CFR§60.4200-§60.4219 [Not Applicable]

   This rule does not apply because there is no compression ignition stationary reciprocating internal combustion engine (RICE) at the facility that was manufactured on or after April 1, 2006 (§60.4200(a)).

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

40CFR§60.4230-§60.4248 [Applicable]

This rule does apply to the Compressor Engines (CE-02 thru CE-08 and CE-12 thru CE-15) because each was constructed ("ordered"), modified or reconstructed after 06/12/06 (§60.4230(a)(5)), with rating equal to or greater than 1,350 bhp, and were manufactured on or after 07/01/07.

Requirements may include:

a. NOx, CO, and VOC emission limits (§60.4233(e)),
b. Operating limits (§60.4243),
c. Performance testing (§60.4244), and
d. Notification and recordkeeping requirements (§60.4245).

10. NSPS KKKK, Stationary Combustion Turbines

40CFR§60.4300-§60.4420 [Not Applicable]

This rule does not apply because there are no stationary gas turbines at the facility with a heat input at peak load equal to or greater than 10.7 gigajoules (10 million Btu) per hour, based on the lower heating value of the fuel fired (§60.4305(a)).

11. 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 reciprocating compressors driven by two 1,380 bhp Caterpillar G3516B compressor engines (CE-07 and CE-08) because the facility is identified within the natural gas production segment and each compressor commenced construction after 08/23/11 and on or before 09/18/15 (§60.5360 and §60.5365(c)).

Requirements may include:

a. Replacing rod packing systems on a specified schedule (§60.5385(a)),
b. Demonstrate initial and continuous compliance (§60.5385(b,c), and
c. Perform reporting and recordkeeping (§60.5385(d)).

This rule does not apply to any other equipment or operations at the facility because each was constructed on or before August 23, 2011 and modified after September 18, 2015 (§60.5360).

12. NSPS OOOOa, Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after September 18, 2015

40CFR§60.5360a-§60.5430a [Applicable]

This rule does apply to the reciprocating compressors driven by the two (2) 1,900 bhp Waukesha L7044 GSI compressor engines (CE-02 and CE-04) because the facility is identified within the natural gas production segment and each compressor commenced construction after 09/18/15 (§60.5360 and §60.5365(c)).

This rule does apply to the reciprocating compressors driven by four 1,380 bhp Caterpillar G3516B compressor engines (CE-12 thru CE-15) because the facility is

identified within the natural gas production segment and each compressor commenced construction after 09/18/15 (§60.5360a and §60.5365a(c)).

Requirements may include:

a. Replacing rod packing systems on a specified schedule (§60.5385a(a)),
b. Demonstrate initial and continuous compliance (§60.5385a(b,c), and
c. Perform reporting and recordkeeping (§60.5385a(d)).

This rule does not apply to the fugitive emission components because while the facility is identified within the Crude Oil and Natural Gas Production source category (SIC Major Group 13), there has been no increase in horsepower at the station after September 18, 2015 (§60.5360a and §60.5397a).

This rule does not apply to the Stabilized Condensate Storage Tanks (TK-01 thru TK-10) nor to the Produced Water Storage Tanks (WTK-11 and WTK-12) (nor any other tank) because each tank does not have the potential to emit more than 6 tpy of VOCs. Note, however, there is a requirement to document that the VOC PTE is less than 6 tpy per tank (§60.5420).

This rule does not apply to the pneumatic controllers because they are compressed air driven, otherwise they have a bleed rate ≤ 6 scfh, and are not located at a natural gas processing plant (§60.5365a(d)(1)).

Other requirements of this rule do not apply because the facility is a) not a well, b) does not have a centrifugal compressor using wet seals, and c) does not have a process unit associated with the processing of natural gas.

C. Applicability of National Emission Standards for Hazardous Air Pollutants (NESHAP)

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

1. NESHAP Part 61 - Designated Source Standards
40CFR§61.01-§61.359 [Not Applicable]

This rule does not apply because the is no equipment, operation, or pollutant emission sources at the subject facility that is subject to the requirements of NESHAP Part 61. (Please reference E.2-NESHAP J and E.3-NESHAP V, below.)

2. NESHAP J - Equipment Leaks (Fugitive Emission Sources) of Benzene
40CFR§61.110-§61.112 [Not Applicable]

This rule does not apply to the Process Piping and Equipment Leaks (FUG) because all the fluids (liquid or gas) at the subject facility contain less than 10 percent benzene by weight (§61.111)

3. **NESHAP V - Equipment Leaks (Fugitive Emission Sources)**
   40CFR§61.240-110-§61.247 [Not Applicable]

   This rule does not apply to the Process Piping and Equipment Leaks (FUG) because all fluids (liquid or gas) at the subject facility contain less than 10 wt% volatile hazardous air pollutants (VHAP) (40CFR§61.245(d)(1)).

4. **NESHAP Part 63 (aka: MACT) - General Provisions**
   40CFR§63.1-§63.16 [Not Applicable]

   This rule does not apply because the is no equipment, operation, or pollutant emission sources at the facility that is subject to the requirements of NESHAP Part 63. (Please reference E.5-NESHAP HH and E.8-NESHAP ZZZZ, below.)

5. **NESHAP HH, Oil and Natural Gas Production Facilities**
   40CFR§63.760-§63.779 [Applicable/Exempt]]

   This rule does apply to the Dehydrators (STL-01 thru STL-03); however, because the facility is an area source of HAP emissions and the actual average emissions of benzene from each glycol dehydration unit process vent to the atmosphere is less than 0.90 megagram per year (1.0 tpy), the only requirement is to maintain records of the actual average benzene emissions per year (§63.774(d)(1)(i)).

   This rule does not apply to storage vessels (tanks), compressors, or ancillary equipment because the facility is an area source of HAP emissions (§63.760(b)(2)).

   In no case does this rule apply to engines or turbines.

6. **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)).

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

   This rule does not apply because the facility is not a major source of HAP emissions (§63.6080).

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

   This rule does apply to the Compressor Engines (CE-02 thru CE-08 and CE-12 thru CE-15). However, because each engine is “new” (i.e., commenced construction or reconstruction on or after 06/12/06) (§63.6590(a)(2)(iii)); the only requirement is compliance with §60.4230-§60.4248 (NSPS JJJJ) for Spark Ignition Internal Combustion Engines.

9. **NESHAP DDDDD, Industrial, Commercial, and Institutional Boilers and Process Heaters – Major Sources**
   40CFR§63.7480 – §63.7575 [Not Applicable]

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

10. NESHAP CCCCCC - Gasoline Dispensing Facilities (GDF)

40CFR§63.11111 [Not Applicable]

This rule does not apply because the subject facility does not dispense gasoline into the fuel tank of a motor vehicle, motor vehicle engine, nonroad vehicle, or nonroad engine (§63.11111 (a)).

11. NESHAP JJJJJJ, Industrial, Commercial, and Institutional Boilers – Area Sources

40CFR§63.11193 – §63.11237 [Not Applicable]

This rule does not apply because the gas-fired Reboilers (RBL-01 thru RBL-03) do not meet the definition of "boiler" in §63.11237. Specifically, "boiler" is defined as an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam and/or hot water. Furthermore, waste heat boilers, process heaters, and autoclaves are excluded from the definition of "boiler".

D. Compliance Assurance Monitoring (CAM)

40CFR§64.1-§64.10 [Potentially Applicable/Deferred]

This rule may apply to the Dehydrators (STL-01 thru STL-03) controlled by STL/STAB Flare (FLR). However, because the pre-control emissions exceed 100 TPY and the post-control emissions of each "pollutant specific emission unit (PSEU)" is less than the Title V Major Source Threshold, the creation and implementation of a Compliance Assurance Monitoring (CAM) plan is deferred until submission of an application for renewal of the Title V Operating Permit (§64.5(a,b)).

This rule does not apply to Compressor Engines (CE-02 thru CE-08, and CE-12 thru CE-15) because they are subject to NSPS JJJJ (§64.2(b)).

This rule does not apply to any other PSEU at the facility because none have potential pre-controlled emissions equal or greater than the applicable Title V Major Source Thresholds (§64.2(a)(3)).

E. Chemical Accident Prevention Provisions (Risk Management Plan (RMP))

440CFR§68.1-§68.220 [Not Applicable]

This rule does not apply because the subject facility does not store more than a threshold quantity of a regulated substance in a process. Specifically, "[P]rior to entry into a natural gas processing plant or a petroleum refining process unit, regulated substances in naturally occurring hydrocarbon mixtures need not be considered when determining whether more than a threshold quantity is present at a stationary source" (§68.115(b)(2)(iii)).

F. Mandatory Greenhouse Gas Reporting (GHGRP)

The following Mandatory Greenhouse Gas Reporting (GHGRP) rules are potentially applicable to natural gas compressor stations. Applicability to the subject facility have been determined as follows:

1. GHGRP - Part 98 - Subpart A - General Provisions

40CFR§98.1-§98.9 [Applicable]

This rule does apply because the subject facility is required to report under GHGRP Subpart W–Petroleum and Natural Gas Systems (§98.1(c)) (§98.2(a)(2)). (Please Reference H.2 below.)

Requirements may include:

a. Follow the procedures for emission calculation, monitoring, quality assurance, missing data, recordkeeping, and reporting that are specified in each relevant GHGRP Subpart (§98.3(a)); and
b. Submit reports no later than March 31 of each calendar year (§98.3(b)).

2. GHGRP W - Petroleum and Natural Gas Systems

40CFR§98.230-§98.238 [Applicable]

This rule does apply because the subject facility:

a. Compresses and/or dehydrates natural gas prior to delivery to a natural gas processing facility or a natural gas transmission pipeline (§98.230(a)(9)); and
b. Actual emissions of CO2 equivalent (CO2e) emissions from the combined applicant-operated, natural gas gathering and boosting equipment within the hydrocarbon basin equal or exceed 25,000 metric tons per year (27,558 US tpy) (§98.230(a)(9), §98.231(a)(3), and §98.238).

Requirements may include:

a. Report CO2, CH4, and N2O emissions from:
    i. Natural gas pneumatic device and pneumatic pump vents (§98.232(j)(1,2)),
    ii. Acid gas removal vents (§98.232(j)(3)),
    iii. Dehydrator vents (§98.232(j)(4)),
    iv. Blowdown vent stacks (§98.232(j)(5)),
    v. Storage tank vented emissions (§98.232(j)(6)),
    vi. Flare stack emissions (§98.232(j)(7)),
    vii. Centrifugal compressor and reciprocating compressor venting (§98.232(j)(8,9)),
    viii. Equipment leaks from valves, connectors, open ended lines, pressure relief valves, pumps, flanges, and other components (such as instruments, loading arms, and compressor seals (§98.232(j)(10)),
    ix. Gathering pipeline equipment leaks (§98.232(j)(11)),
    x. Natural gas dehydrators, natural gas compressors, electrical generators, steam boilers, and process heaters (§98.232(j)(12));
b. Calculating GHG emissions (§98.233(a-z));
c. Monitoring and QA/QC requirements (§98.234(a-h));
d. Procedures for estimating missing data (§98.235(a-i));
e. Data reporting requirement (§98.236(a-cc)); and
f. Records retention (§98.237(a-f)).

G. Applicability of State Regulations

The following state regulations are potentially applicable to natural gas compressor stations. 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 reboilers (RBL-01 thru RBL-03) and Hot Oil Heater (OH-01); however, because the reboilers and heater each have a maximum design heat input (MDHI) rating less than 10 MMBtu/hr, the only requirement is to limit visible emissions to less than 10% opacity during normal operations (§45-02-3.1). The reboilers and heater combust only natural gas which inherently conforms to the visible emission standards.

2. **Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors (State Only)**
   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.

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

   This rule does apply to the STL/STAB Flare (FLR); however, this unit combusts waste from natural gas operations which inherently conforms to the particulate emission and opacity standards.

4. **Prevent and Control Air Pollution from the Emission of Sulfur Oxides**
   45CSR10 [Not Applicable]

   This rule does not apply to the Compressor Engines (CE-02 thru CE-08, and CE-12 thru CE15), Reboilers (RBL-01 thru RBL-03, STL/STAB Flare (FLR), or any other fuel burning unit, manufacturing process sources, or combustion source at the facility because each combust only natural gas (45-10A-3.1.b).

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

   This rule does apply. The facility is currently operating under 45CSR13 NSR Class II Administrative Update Construction Permit R13-2831E, issued January 21, 2016.

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

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

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

The rule does apply to this source by reference to §40CFR60 Subparts JJJJ and OOOOa. The facility is subject to the notification, testing, monitoring, and recordkeeping and reporting requirements of these Subparts.

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

This rule does not apply because the facility is not located in a designated nonattainment area.

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

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

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 (Best Available Control Technology (BAT))
45CSR27 [Not Applicable]

This rule does not apply because the equipment used in the production and distribution of petroleum products is exempt, provided the product contains no more than 5% benzene by weight (45-27-2.4).

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

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

14. Requirements for Operating Permits

45CSR30 [Applicable]

This rule does apply because the facility qualifies as a “Title V Major Source”. (See section C.4. above.)

15. Emission Standards for Hazardous Air Pollutants (HAP)

45CSR34 [Not Applicable]

This rule does not apply because the facility is an “Minor (Area) Source” of HAP emissions. Note the provisions under Subparts HH and ZZZZ of 40 CFR Part 63 which apply to non-major area sources of hazardous air pollutants are excluded from these requirements.

Supplement S3

Emission Calculations

Criteria Pollutants - Controlled

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	NOX		CO		VOC (w/HCHO)		PM10/2.5		SO2	
							lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
Miller Compressor Station - Point Sources																
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	1.26	5.50	2.47	10.82	0.20	0.85	0.30	1.32	0.01	0.04
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	1.48	6.48	1.81	7.92	0.17	0.76	0.20	0.88	0.01	0.03
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	1.26	5.50	2.47	10.82	0.20	0.85	0.30	1.32	0.01	0.04
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	1.48	6.48	1.81	7.92	0.17	0.76	0.20	0.88	0.01	0.03
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	1.48	6.48	1.81	7.92	0.17	0.76	0.20	0.88	0.01	0.03
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	1.52	6.66	1.52	6.66	1.19	5.20	0.11	0.50	0.01	0.03
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	---	---	---	4.15	18.17	---	---	---	---
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	---	---	---	4.98	21.81	---	---	---	---
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	---	---	---	1.50	6.57	---	---	---	---
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	0.04	0.20	0.24	1.07	0.09	0.38	3E-03	0.01	2E-04	9E-04
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	0.48	2.10	1.32	5.78	0.14	0.61	0.18	0.79	0.02	0.07
EUSTL-1	EPSTL-1	STL-01	Dehydrator 01 - Flash Tank and Still Vent	55.0 MMscfd	Flash/FLR Still/Cond Recycle	8,760	---	---	---	---	0.32	1.40	---	---	---	---
EUSTL-2	EPSTL-2	STL-02	Dehydrator 02 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	---	---	---	0.32	1.40	---	---	---	---
EUSTL-3	EPSTL-3	STL-03	Dehydrator 03 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	---	---	---	0.32	1.40	---	---	---	---
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	---	---	---	0.10	0.44	---	---	---	---
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	0.33	1.44	0.28	1.21	0.02	0.08	0.02	0.11	2E-03	0.01
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	---	---	---	0.25	1.11	---	---	---	---
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)	VRU	8,760	---	---	---	---	0.02	0.10	---	---	---	---
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	3.05	13.34	---	---	---	---
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	0.04	0.18	---	---	---	---
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	---	---	---	0.14	0.63	---	---	---	---
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	0.49	2.15	1.55	6.79	0.03	0.12	0.04	0.16	3E-03	0.01
			Miller Compressor Station - Point Sources				**17.72**	**77.61**	**23.13**	**101.30**	**23.52**	**103.00**	**2.16**	**9.44**	**0.10**	**0.44**
Miller Compressor Station - Fugitives																
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	---	---	---	0.73	3.19	---	---	---	---
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units	LDAR	8,760	---	---	---	---	1.36	5.97	---	---	---	---
			Miller Compressor Station - Fugitives				**---**	**---**	**---**	**---**	**2.09**	**9.16**	**---**	**---**	**---**	**---**
Miller Compressor Station - Total																
			Miller Compressor Station - Total				**17.72**	**77.61**	**23.13**	**101.30**	**25.61**	**112.16**	**2.16**	**9.44**	**0.10**	**0.44**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

Current Permit Total	**---**	**79.56**	**---**	**101.30**	**---**	**111.76**	**---**	**9.44**	**---**	**0.44**
Increase/(Decrease)	**---**	**(1.96)**	**---**	**0.00**	**---**	**0.40**	**---**	**0.00**	**---**	**0.00**
% Change	**---**	**(2%)**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**

lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
NOX		**CO**		**VOC (w/HCHO)**		**PM10/2.5**		**SO2**	

Hazardous Air Pollutants (HAP) - Controlled - Page 01 of 02

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	Acetaldehyde lb/hr*	Acetaldehyde tpy	Acrolein lb/hr*	Acrolein tpy	Benzene lb/hr*	Benzene tpy	Butadiene, 1,3- lb/hr*	Butadiene, 1,3- tpy	Ethylbenzene lb/hr*	Ethylbenzene tpy	HCHO lb/hr*	HCHO tpy	n-Hexane lb/hr*	n-Hexane tpy
Miller Compressor Station - Point Sources																				
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	0.02	0.09	0.02	0.09	0.01	0.05	5E-03	0.02	2E-04	8E-04	0.05	0.22	---	---
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	4E-03	0.02	4E-03	0.02	3E-03	0.01	1E-03	5E-03	4E-05	2E-04	0.02	0.10	---	---
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	0.02	0.09	0.02	0.09	0.01	0.05	0.01	0.02	2E-04	8E-04	0.05	0.22	---	---
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	4E-03	0.02	4E-03	0.02	3E-03	0.01	1E-03	5E-03	4E-05	2E-04	0.02	0.10	---	---
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	4E-03	0.02	4E-03	0.02	3E-03	0.01	1E-03	5E-03	4E-05	2E-04	0.02	0.10	---	---
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	0.05	0.23	0.03	0.14	3E-03	0.01	2E-03	0.01	2E-04	1E-03	0.31	1.38	0.01	0.03
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	---	---	---	0.01	0.06	---	---	0.01	0.06	---	---	0.06	0.28
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	---	---	---	0.02	0.07	---	---	0.02	0.07	---	---	0.08	0.33
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	---	---	---	5E-03	0.02	---	---	5E-03	0.02	---	---	0.02	0.10
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	3E-03	0.01	2E-03	0.01	1E-04	6E-04	9E-05	4E-04	1E-05	6E-05	0.04	0.17	4E-04	2E-03
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	1E-03	5E-03	2E-04	8E-04	3E-04	1E-03	1E-05	5E-05	9E-04	4E-03	0.02	0.09	---	---
EUSTL-1	EPSTL-1	STL-01	Dehydrator 01 - Flash Tank and Still Vent	55.0 MMscfd	Flash/FLR Still/Cond Recycle	8,760	---	---	---	---	2E-03	0.01	---	---	3E-07	1E-06	---	---	4E-03	0.02
EUSTL-2	EPSTL-2	STL-02	Dehydrator 02 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	---	---	---	2E-03	0.01	---	---	3E-07	1E-06	---	---	4E-03	0.02
EUSTL-3	EPSTL-3	STL-03	Dehydrator 03 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	---	---	---	2E-03	0.01	---	---	3E-07	1E-06	---	---	4E-03	0.02
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	---	---	---	5E-05	2E-04	---	---	5E-05	2E-04	---	---	2E-03	0.01
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	---	---	---	---	7E-06	3E-05	---	---	---	---	2E-04	1E-03	0.01	0.03
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	---	---	---	1E-04	5E-04	---	---	3E-03	0.01	---	---	0.01	0.05
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	---	---	---	---	1E-05	5E-05	---	---	3E-04	1E-03	---	---	1E-03	5E-03
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	9E-04	4E-03	---	---	9E-04	4E-03	---	---	0.03	0.15
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	1E-05	5E-05	---	---	1E-05	5E-05	---	---	5E-05	2E-04
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	---	---	---	4E-04	2E-03	---	---	4E-04	2E-03	---	---	2E-03	0.01
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	---	---	---	---	1E-05	5E-05	---	---	---	---	4E-04	2E-03	0.01	0.04
			Miller Compressor Station - Point Sources				**0.37**	**1.62**	**0.25**	**1.07**	**0.09**	**0.39**	**0.02**	**0.10**	**0.04**	**0.18**	**2.11**	**9.26**	**0.29**	**1.25**
Miller Compressor Station - Fugitives																				
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	---	---	---	2E-03	0.01	---	---	2E-03	0.01	---	---	0.01	0.05
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	---	---	---	---	7E-04	3E-03	---	---	0.02	0.08	---	---	0.06	0.28
			Miller Compressor Station - Fugitives				**---**	**---**	**---**	**---**	**3E-03**	**0.01**	**---**	**---**	**0.02**	**0.08**	**---**	**---**	**0.07**	**0.33**
Miller Compressor Station - Total																				
			Miller Compressor Station - Total				**0.37**	**1.62**	**0.25**	**1.07**	**0.09**	**0.41**	**0.02**	**0.10**	**0.06**	**0.26**	**2.11**	**9.26**	**0.36**	**1.58**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

	Acetaldehyde lb/hr*	Acetaldehyde tpy	Acrolein lb/hr*	Acrolein tpy	Benzene lb/hr*	Benzene tpy	Butadiene, 1,3- lb/hr*	Butadiene, 1,3- tpy	Ethylbenzene lb/hr*	Ethylbenzene tpy	HCHO lb/hr*	HCHO tpy	n-Hexane lb/hr*	n-Hexane tpy
Current Permit Total	**0.37**	**1.62**	**0.25**	**1.07**	**0.09**	**0.41**	**0.02**	**0.10**	**0.06**	**0.26**	**2.11**	**9.26**	**0.36**	**1.58**
Increase/(Decrease)	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**
% Change	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Acetaldehyde		**Acrolein**		**Benzene**		**Butadiene, 1,3-**		**Ethylbenzene**		**HCHO**		**n-Hexane**	

Hazardous Air Pollutants (HAP) - Controlled - Page 02 of 02

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime	Methanol		POM		Toluene		TMP, 2,2,4-		Xylenes		Other HAP		TOTAL HAPs	
						hr/yr	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Miller Compressor Station - Point Sources																				
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	0.02	0.10	2E-03	0.01	4E-03	0.02	---	---	2E-03	0.01	1E-03	0.01	**0.14**	**0.63**
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	5E-03	0.02	4E-04	2E-03	9E-04	4E-03	---	---	3E-04	1E-03	3E-04	1E-03	**0.04**	**0.19**
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-05	8,760	0.02	0.10	2E-03	0.01	4E-03	0.02	---	---	2E-03	0.01	1E-03	0.01	**0.14**	**0.63**
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	5E-03	0.02	4E-04	2E-03	9E-04	4E-03	---	---	3E-04	1E-03	3E-04	1E-03	**0.04**	**0.19**
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	5E-03	0.02	4E-04	2E-03	9E-04	4E-03	---	---	3E-04	1E-03	3E-04	1E-03	**0.04**	**0.19**
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	0.02	0.07	2E-03	0.01	3E-03	0.01	2E-03	0.01	1E-03	5E-03	2E-03	0.01	**0.43**	**1.90**
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	0.05	0.22	---	---	0.01	0.06	0.01	0.06	0.01	0.06	---	---	**0.18**	**0.78**
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	0.06	0.27	---	---	0.02	0.07	0.02	0.07	0.02	0.07	---	---	**0.21**	**0.93**
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	0.02	0.08	---	---	5E-03	0.02	5E-03	0.02	5E-03	0.02	---	---	**0.06**	**0.28**
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	8E-04	4E-03	1E-04	5E-04	1E-04	6E-04	8E-05	4E-04	6E-05	3E-04	1E-04	5E-04	**0.05**	**0.20**
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	---	---	9E-04	4E-03	4E-03	0.02	---	---	2E-03	8E-03	8E-04	3E-03	**0.03**	**0.13**
EUSTL-1	EPSTL-1	STL-01	Dehydrator 01 - Flash Tank and Still Vent	55.0 MMscfd	Flash/FLR Still/Cond Recycle	8,760	0.03	0.12	---	---	2E-03	0.01	2E-03	0.01	2E-03	0.01	---	---	**0.04**	**0.17**
EUSTL-2	EPSTL-2	STL-02	Dehydrator 02 - Flash Tank and Still Vent	55.0 MMscfd		8,760	0.03	0.12	---	---	2E-03	0.01	2E-03	0.01	2E-03	0.01	---	---	**0.04**	**0.17**
EUSTL-3	EPSTL-3	STL-03	Dehydrator 03 - Flash Tank and Still Vent	55.0 MMscfd		8,760	0.03	0.12	---	---	2E-03	0.01	2E-03	0.01	2E-03	0.01	---	---	**0.04**	**0.17**
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	**2E-03**	**0.01**
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	**2E-03**	**0.01**
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	**2E-03**	**0.01**
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	5E-05	2E-04	---	---	---	---	3E-04	2E-03	5E-05	2E-04			**2E-03**	**0.01**
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	---	---	2E-06	1E-05	1E-05	5E-05	---	---	---	---	4E-06	2E-05	**0.01**	**0.03**
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	8E-05	4E-04	---	---	2E-03	0.01	0.00	0.005	4E-03	0.02	---	---	**0.02**	**0.10**
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	8E-06	3E-05	---	---	1E-04	6E-04	1E-04	4E-04	4E-04	2E-03	---	---	**2E-03**	**0.01**
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	9E-04	4E-03	---	---	0.00	0.00	0.01	0.03	9E-04	4E-03	---	---	**0.04**	**0.20**
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			1E-06	5E-06	---	---	1E-06	5E-06	9E-06	4E-05	1E-06	5E-06	---	---	**6E-05**	**3E-04**
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	2E-03	0.01	---	---	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	---	---	**0.01**	**0.03**
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	---	---	3E-06	1E-05	2E-05	7E-05	---	---	---	---	6E-06	3E-05	**0.01**	**0.04**
			Miller Compressor Station - Point Sources				**0.37**	**1.61**	**0.02**	**0.09**	**0.07**	**0.32**	**0.06**	**0.25**	**0.06**	**0.25**	**0.02**	**0.07**	**3.76**	**16.46**
Miller Compressor Station - Fugitives																				
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	0.01	0.04	---	---	2E-03	0.01	2E-03	0.01	2E-03	0.01	---	---	0.03	0.14
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	4E-04	2E-03	---	---	0.01	0.04	0.01	0.03	0.02	0.10	---	---	0.12	0.52
			Miller Compressor Station - Fugitives				**0.01**	**0.04**	**---**	**---**	**0.01**	**0.05**	**0.01**	**0.04**	**0.02**	**0.11**	**---**	**---**	**0.15**	**0.65**
Miller Compressor Station - Total																				
			Miller Compressor Station - Total				**0.38**	**1.65**	**0.02**	**0.09**	**0.08**	**0.37**	**0.07**	**0.28**	**0.08**	**0.36**	**0.02**	**0.07**	**3.91**	**17.11**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

	Methanol		POM		Toluene		TMP, 2,2,4-		Xylenes		Other HAP		TOTAL HAPs	
	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Current Permit Total	**0.38**	**1.65**	**0.02**	**0.09**	**0.08**	**0.37**	**0.07**	**0.28**	**0.08**	**0.36**	**0.02**	**0.07**	**3.91**	**17.11**
Increase/(Decrease)	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**	**---**	**0.00**
% Change	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**	**---**	**0%**

Greenhouse Gas (GHG) Pollutants - Controlled

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr*	Heat Input (HHV) MMBtu/hr	CO2 GWP: 1 tpy	CO2e 1 tpy	CH4 GWP: 25 tpy	CO2e 25 tpy	N2O GWP: 298 tpy	CO2e 298 tpy	TOTAL CO2e lb/hr*	TOTAL CO2e tpy
Miller Compressor Station - Point Sources															
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	15.54	8,531	8,531	4.40	110	0.02	4.47	**1,974**	**8,646**
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	15.54	8,531	8,531	4.40	110	0.02	4.47	**1,974**	**8,646**
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	0.66	0.66	88.18	2,204	---	---	**503.46**	**2,205**
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	0.80	0.80	105.85	2,646	---	---	**604.35**	**2,647**
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	0.24	0.24	31.87	796.80	---	---	**181.97**	**797.04**
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	---	207.34	207.34	1.84	45.88	3E-04	0.10	**57.83**	**253.32**
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	---	13,182	13,182	1.04	25.89	0.36	107.14	**3,040**	**13,315**
EUSTL-1	EPSTL-1	STL-01	Dehydrator 01 - Flash Tank and Still Vent	55.0 MMscfd	Flash/FLR Still/Cond Recycle	8,760	---	4.03	4.03	2.28	57.09	---	---	**13.95**	**61.12**
EUSTL-2	EPSTL-2	STL-02	Dehydrator 02 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	4.03	4.03	2.28	57.09	---	---	**13.95**	**61.12**
EUSTL-3	EPSTL-3	STL-03	Dehydrator 03 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	4.03	4.03	2.28	57.09	---	---	**13.95**	**61.12**
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	0.15	0.15	0.14	3.57	---	---	**0.85**	**3.72**
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	3.35	1,716	1,716	0.03	0.81	3E-03	0.96	**392.28**	**1,718**
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	0.23	0.23	0.22	5.46	---	---	**1.30**	**5.69**
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	---	0.02	0.02	0.02	0.50	---	---	**0.12**	**0.52**
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	---	---	---	**---**	**---**
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	---	---	---	**---**	**---**
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	0.02	0.02	3.04	76.01	---	---	**17.36**	**76.03**
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	5.00	2,576	2,576	0.05	1.23	0.05	14.08	**591.73**	**2,592**
			Miller Compressor Station - Point Sources				**141.63**	**99,500**	**99,500**	**652.19**	**16,305**	**0.54**	**160.62**	**26,476**	**115,965**
Miller Compressor Station - Fugitives															
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	0.12	0.12	15.47	386.81	---	---	**88.34**	**386.93**
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	---	---	---	---	---	---	---	**---**	**---**
			Miller Compressor Station - Fugitives				**---**	**0.12**	**0.12**	**15.47**	**386.81**	**---**	**---**	88.34	**386.93**
Miller Compressor Station - Total															
			Miller Compressor Station - Total				**141.63**	**99,500**	**99,500**	**667.66**	**16,692**	**0.54**	**160.62**	**26,564**	**116,352**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

	CO2 tpy	CO2e tpy	CH4 tpy	CO2e tpy	N2O tpy	CO2e tpy	TOTAL CO2e lb/hr*	TOTAL CO2e tpy
Current Permit Total	**99,500**	**99,500**	**679.74**	**16,993**	**0.54**	**160.62**	**26,633**	**116,654**
Increase/(Decrease)	**0**	**0**	**-12.07**	**(302)**	**0.00**	**0.00**	**(69)**	**(302)**
% Change	**0%**	**0%**	**-2%**	**-2%**	**0%**	**0%**	**0%**	**0%**

Criteria Pollutants - Pre-Controlled

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	NOX		CO		VOC (w/HCHO)		PM10/2.5		SO2	
							lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Miller Compressor Station - Point Sources																
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	48.34	211.72	40.34	176.68	0.50	2.19	0.30	1.32	0.01	0.04
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	42.29	185.23	26.77	117.27	1.12	4.91	0.20	0.88	0.01	0.03
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	48.34	211.72	40.34	176.68	0.50	2.19	0.30	1.32	0.01	0.04
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	42.29	185.23	26.77	117.27	1.12	4.91	0.20	0.88	0.01	0.03
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	42.29	185.23	26.77	117.27	1.12	4.91	0.20	0.88	0.01	0.03
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	1.52	6.66	8.24	36.11	2.92	12.80	0.11	0.50	0.01	0.03
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	---	---	---	4.15	18.17	---	---	---	---
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	---	---	---	4.98	21.81	---	---	---	---
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	---	---	---	1.50	6.57	---	---	---	---
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	0.04	0.20	0.24	1.07	0.09	0.38	3E-03	0.01	2E-04	9E-04
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	0.48	2.10	1.32	5.78	0.14	0.61	0.18	0.79	0.02	0.07
EUSTL-1	EPSTL-1	STL-01	Dehydrator 01 - Flash Tank and Still Vent	55.0 MMscfd	Flash/FLR Still/Cond Recycle	8,760	---	---	---	---	47.65	208.72	---	---	---	---
EUSTL-2	EPSTL-2	STL-02	Dehydrator 02 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	---	---	---	47.65	208.72	---	---	---	---
EUSTL-3	EPSTL-3	STL-03	Dehydrator 03 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	---	---	---	47.65	208.72	---	---	---	---
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	6E-04	3E-03
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	---	---	---	5.01	21.94	---	---	---	---
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	0.33	1.44	0.28	1.21	0.02	0.08	0.02	0.11	2E-03	0.01
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	---	---	---	12.67	55.51	---	---	---	---
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	---	---	---	---	1.27	5.55	---	---	---	---
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	9.09	39.81	---	---	---	---
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	0.12	0.53	---	---	---	---
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	---	---	---	0.14	0.63	---	---	---	---
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	No Pre-Controlled Emissions from the Flare									
Miller Compressor Station - Point Sources							**233.82**	**1,024**	**212.55**	**931**	**204.05**	**893.72**	**2.12**	**9.28**	**0.10**	**0.42**
Miller Compressor Station - Fugitives																
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	---	---	---	3.10	13.60	---	---	---	---
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	---	---	---	---	4.97	21.78	---	---	---	---
Miller Compressor Station - Fugitives							**---**	**---**	**---**	**---**	**8.08**	**35.38**	**---**	**---**	**---**	**---**
Miller Compressor Station - Total																
Miller Compressor Station - Total							**233.82**	**1,024**	**212.55**	**931**	**212.12**	**929.10**	**2.12**	**9.28**	**0.10**	**0.42**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
NOX		CO		VOC (w/HCHO)		PM10/2.5		SO2	

Hazardous Air Pollutants (HAP) - Pre-Controlled - Page 01 of 02

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	Acetaldehyde		Acrolein		Benzene		Butadiene, 1,3-		Ethylbenzene		HCHO		n-Hexane	
							lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Miller Compressor Station - Point Sources																				
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	0.04	0.19	0.04	0.18	0.02	0.11	0.01	0.05	4E-04	2E-03	0.21	0.92	---	---
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	0.03	0.13	0.03	0.12	0.02	0.07	0.01	0.03	3E-04	1E-03	0.15	0.67	---	---
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	0.04	0.19	0.04	0.18	0.02	0.11	0.01	0.05	4E-04	2E-03	0.21	0.92	---	---
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	0.03	0.13	0.03	0.12	0.02	0.07	0.01	0.03	3E-04	1E-03	0.15	0.67	---	---
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	0.03	0.13	0.03	0.12	0.02	0.07	0.01	0.03	3E-04	1E-03	0.15	0.67	---	---
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	0.09	0.42	0.06	0.26	5E-03	0.02	3E-03	0.01	5E-04	2E-03	1.31	5.73	0.01	0.06
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	---	---	---	0.01	0.06	---	---	0.01	0.06	---	---	0.06	0.28
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	---	---	---	0.02	0.07	---	---	0.02	0.07	---	---	0.08	0.33
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	---	---	---	5E-03	0.02	---	---	5E-03	0.02	---	---	0.02	0.10
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	3E-03	0.01	2E-03	0.01	1E-04	6E-04	9E-05	4E-04	1E-05	6E-05	0.04	0.17	4E-04	2E-03
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	1E-03	5E-03	2E-04	8E-04	3E-04	1E-03	1E-05	5E-05	9E-04	4E-03	2E-02	9E-02	---	---
EUSTL-1	EPSTL-1	STL-01	Dehydrator 01 - Flash Tank and Still Vent	55.0 MMscfd	Flash/FLR Still/Cond Recycle	8,760	---	---	---	---	1.03	4.50	---	---	3E-05	1E-04	---	---	1.23	5.39
EUSTL-2	EPSTL-2	STL-02	Dehydrator 02 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	---	---	---	1.03	4.50	---	---	3E-05	1E-04	---	---	1.23	5.39
EUSTL-3	EPSTL-3	STL-03	Dehydrator 03 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	---	---	---	1.03	4.50	---	---	3E-05	1E-04	---	---	1.23	5.39
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	---	---	---	---	2E-06	9E-06	---	---	---	---	7E-05	3E-04	2E-03	0.01
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	---	---	---	2E-03	0.01			2E-03	0.01			0.09	0.40
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	---	---	---	---	7E-06	3E-05	---	---	---	---	2E-04	1E-03	0.01	0.03
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	---	---	---	0.01	0.03	---	---	0.16	0.70	---	---	0.59	2.57
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	---	---	---	---	6E-04	2E-03	---	---	0.01	0.06	---	---	0.05	0.24
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	3E-03	0.01	---	---	3E-03	0.01	---	---	0.10	0.44
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	4E-05	5E-05	---	---	4E-05	5E-05	---	---	1E-04	2E-04
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	---	---	---	4E-04	2E-03	---	---	4E-04	2E-03	---	---	2E-03	0.01
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	No Pre-Controlled Emissions from the Flare													
			Miller Compressor Station - Point Sources				**0.75**	**3.27**	**0.52**	**2.26**	**3.25**	**14.25**	**0.06**	**0.26**	**0.22**	**0.95**	**8.78**	**38.47**	**4.78**	**20.92**
Miller Compressor Station - Fugitives																				
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	---	---	---	0.01	0.04	---	---	0.01	0.04	---	---	0.05	0.21
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	---	---	---	---	2E-03	0.01	---	---	0.06	0.27	---	---	0.23	1.01
			Miller Compressor Station - Fugitives				**---**	**---**	**---**	**---**	**0.01**	**0.05**	**---**	**---**	**0.07**	**0.32**	**---**	**---**	**0.28**	**1.22**
Miller Compressor Station - Total																				
			Miller Compressor Station - Total				**0.75**	**3.27**	**0.52**	**2.26**	**3.27**	**14.30**	**0.06**	**0.26**	**0.29**	**1.27**	**8.78**	**38.47**	**5.05**	**22.13**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Acetaldehyde		Acrolein		Benzene		Butadiene, 1,3-		Ethylbenzene		HCHO		n-Hexane	

Hazardous Air Pollutants (HAP) - Pre-Controlled - Page 02 of 02

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr	Methanol		POM		Toluene		TMP, 2,2,4-		Xylenes		Other HAP		TOTAL HAPs	
							lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Miller Compressor Station - Point Sources																				
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	0.05	0.21	4E-03	0.02	0.01	0.04	---	---	3E-03	0.01	3E-03	0.01	0.39	1.73
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	0.03	0.14	2E-03	0.01	0.01	0.03	---	---	2E-03	0.01	2E-03	0.01	0.28	1.21
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	0.05	0.21	4E-03	0.02	0.01	0.04	---	---	3E-03	0.01	3E-03	0.01	0.39	1.73
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	0.03	0.14	2E-03	0.01	0.01	0.03	---	---	2E-03	0.01	2E-03	0.01	0.28	1.21
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	0.03	0.14	2E-03	0.01	0.01	0.03	---	---	2E-03	0.01	2E-03	0.01	0.28	1.21
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	0.03	0.12	4E-03	0.02	5E-03	0.02	3E-03	0.01	2E-03	9E-03	4E-03	0.02	1.53	6.69
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	0.05	0.22	---	---	0.01	0.06	0.01	0.06	0.01	0.06	---	---	0.18	0.78
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	0.06	0.27	---	---	0.02	0.07	0.02	0.07	0.02	0.07	---	---	0.21	0.93
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	0.02	0.08	---	---	5E-03	0.02	5E-03	0.02	5E-03	0.02	---	---	0.06	0.28
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	8E-04	4E-03	1E-04	5E-04	1E-04	6E-04	8E-05	4E-04	6E-05	3E-04	1E-04	5E-04	0.05	0.20
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	---	---	9E-04	4E-03	4E-03	2E-02	---	---	2E-03	8E-03	8E-04	3E-03	3E-02	0.13
EUSTL-1	EPSTL-1	STL-01	Dehydrator 01 - Flash Tank and Still Vent	55.0 MMscfd	Flash/FLR Still/Cond Recycle	8,760	1.32	5.78	---	---	1.61	7.04	0.02	0.09	7.05	30.86	---	---	12.25	53.66
EUSTL-2	EPSTL-2	STL-02	Dehydrator 02 - Flash Tank and Still Vent	55.0 MMscfd		8,760	1.32	5.78	---	---	1.61	7.04	0.02	0.09	7.05	30.86	---	---	12.25	53.66
EUSTL-3	EPSTL-3	STL-03	Dehydrator 03 - Flash Tank and Still Vent	55.0 MMscfd		8,760	1.32	5.78	---	---	1.61	7.04	0.02	0.09	7.05	30.86	---	---	12.25	53.66
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	2E-03	0.01
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	2E-03	0.01
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	---	---	7E-07	3E-06	3E-06	1E-05	---	---	---	---	1E-06	5E-06	2E-03	0.01
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	2E-03	0.01	---	---	2E-03	1E-02	2E-02	8E-02	2E-03	1E-02	---	---	0.12	0.54
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	---	---	2E-06	1E-05	1E-05	5E-05	---	---	---	---	4E-06	2E-05	0.01	0.03
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	4E-03	0.02	---	---	0.08	0.35	0.05	0.24	0.21	0.91	---	---	1.10	4.81
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	4E-04	2E-03	---	---	0.01	0.03	5E-03	0.02	0.02	0.08	---	---	0.10	0.44
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	3E-03	0.01	---	---	3E-03	0.01	0.02	0.08	3E-03	0.01	---	---	0.13	0.59
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			1E-06	5E-06	---	---	1E-06	5E-06	9E-06	4E-05	1E-06	5E-06	---	---	6E-05	3E-04
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	2E-03	0.01	---	---	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	---	---	0.01	0.03
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	No Pre-Controlled Emissions from the Flare													
Miller Compressor Station - Point Sources							**4.46**	**19.55**	**0.04**	**0.18**	**5.02**	**21.97**	**0.21**	**0.90**	**21.43**	**93.87**	**0.03**	**0.15**	**49.54**	**217.00**
Miller Compressor Station - Fugitives																				
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	0.04	0.17	---	---	0.01	0.04	0.01	0.04	0.01	0.04	---	---	0.13	0.58
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	2E-03	0.01	---	---	0.03	0.14	0.02	0.09	0.08	0.36	---	---	0.43	1.89
Miller Compressor Station - Fugitives							**0.04**	**0.17**	**---**	**---**	**0.04**	**0.18**	**0.03**	**0.14**	**0.09**	**0.40**	**---**	**---**	**0.56**	**2.47**
Miller Compressor Station - Total																				
Miller Compressor Station - Total							**4.50**	**19.73**	**0.04**	**0.18**	**5.06**	**22.15**	**0.24**	**1.03**	**21.52**	**94.27**	**0.03**	**0.15**	**50.11**	**219.47**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Methanol		POM		Toluene		TMP, 2,2,4-		Xylenes		Other HAP		TOTAL HAPs	

Greenhouse Gas (GHG) Pollutants - Pre-Controlled

Unit ID	Point ID	Source ID	Description	Site Rating	Control Device	Runtime hr/yr*	Heat Input (HHV) MMBtu/hr	CO2 GWP: 1 tpy	CO2e 1 tpy	CH4 GWP: 25 tpy	CO2e 25 tpy	N2O GWP: 298 tpy	CO2e 298 tpy	TOTAL CO2e lb/hr*	TOTAL CO2e tpy
Miller Compressor Station - Point Sources															
EUCE-2	EPCE-2	CE-02	Compressor Engine 02 - Waukesha L7044 GSI	1,900 bhp	NSCR-02	8,760	15.54	8,531	8,531	4.40	110	0.02	4.47	**1,974**	**8,646**
EUCE-3	EPCE-3	CE-03	Compressor Engine 03 - Waukesha L5794 GSI	1,380 bhp	NSCR-03	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-4	EPCE-4	CE-04	Compressor Engine 04 - Waukesha L7044 GSI	1,900 bhp	NSCR-04	8,760	15.54	8,531	8,531	4.40	110	0.02	4.47	**1,974**	**8,646**
EUCE-5	EPCE-5	CE-05	Compressor Engine 05 - Waukesha L5794 GSI	1,380 bhp	NSCR-05	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-6	EPCE-6	CE-06	Compressor Engine 06 - Waukesha L5794 GSI	1,380 bhp	NSCR-06	8,760	10.36	7,023	7,023	10.44	261	0.01	2.98	**1,664**	**7,287**
EUCE-7	EPCE-7	CE-07	Compressor Engine 07 - CAT G3516B	1,380 bhp	OxCat -07	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-8	EPCE-8	CE-08	Compressor Engine 08 - CAT G3516B	1,380 bhp	OxCat -08	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-12	EPCE-12	CE-12	Compressor Engine 12 - CAT G3516B	1,380 bhp	OxCat -12	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-13	EPCE-13	CE-13	Compressor Engine 13 - CAT G3516B	1,380 bhp	OxCat -13	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-14	EPCE-14	CE-14	Compressor Engine 14 - CAT G3516B	1,380 bhp	OxCat -14	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUCE-15	EPCE-15	CE-15	Compressor Engine 15 - CAT G3516B	1,380 bhp	OxCat -15	8,760	11.35	7,023	7,023	62.15	1,554	0.01	3.27	**1,959**	**8,580**
EUBD	EPBD	BD	Compressor Blowdown/Emergency Shutdown Tests	574 Events/yr	---	8,760	---	0.66	0.66	88.18	2,204	---	---	**503.46**	**2,205**
EUCRP	EPCRP	CRP	Compressor Rod Packing	11 Units	---	8,760	---	0.80	0.80	105.85	2,646	---	---	**604.35**	**2,647**
EUESU	EPESU	ESU	Engine Start-up	11 Units	---	8,760	---	0.24	0.24	31.87	796.80	---	---	**181.97**	**797.04**
EUECC	EPECC	ECC	Engine Crankcase	11 Units	---	8,760	---	207.34	207.34	1.84	45.88	3E-04	0.10	**57.83**	**253.32**
EUGEN-1	EPGEN-1	GEN-01	Microturbine Generator-01 - Capstone C600	805 bhp	---	8,760	---	13,182	13,182	1.04	25.89	0.36	107.14	**3,040.01**	**13,315**
EUSTL-1	EPSTL-1	STL-01	Dehydrator 01 - Flash Tank and Still Vent	55.0 MMscfd	Flash/FLR Still/Cond Recycle	8,760	---	4.03	4.03	2.28	57.09	---	---	**13.95**	**61.12**
EUSTL-2	EPSTL-2	STL-02	Dehydrator 02 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	4.03	4.03	2.28	57.09	---	---	**13.95**	**61.12**
EUSTL-3	EPSTL-3	STL-03	Dehydrator 03 - Flash Tank and Still Vent	55.0 MMscfd		8,760	---	4.03	4.03	2.28	57.09	---	---	**13.95**	**61.12**
EURBL-1	EPRBL-1	RBL-01	Reboiler 01	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EURBL-2	EPRBL-2	RBL-02	Reboiler 02	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EURBL-3	EPRBL-3	RBL-03	Reboiler 03	1.00 MMBtu/hr	---	8,760	1.00	512.36	512.36	0.01	0.24	1E-03	0.29	**117.10**	**512.89**
EUSTAB	EPSTAB	STAB	Condensate Stabilizer - Bypass to Flare	120 hr/yr	FLR	8,760	---	0.15	0.15	7.13	178.31	---	---	**40.74**	**178.46**
EUOH-1	EPHOH-1	OH-01	Hot Oil Heater - Condensate Stabilizer	3.35 MMBtu/hr	---	8,760	3.35	1,716	1,716	0.03	0.81	3E-03	0.96	**392.28**	**1,718**
EUTK-1-12	EPTK-1-12	TK-01-10	Storage Tank 01-10 - Stabilized Condensate (SC)	4,000 bbl (total)	VRU	8,760	---	0.23	0.23	0.22	5.46	---	---	**1.30**	**5.69**
		WTK-11-12	Storage Tank 11-12 - Produced Fluid/Water (PW)	800 bbl (total)		8,760	---	0.02	0.02	0.02	0.50	---	---	**0.12**	**0.52**
EULOR	EPLOR	LOR	Truck Loading - Stabilized Condensate (SC)	11,498 Mgal/yr	CarbCan	8,760	---	---	---	---	---	---	---	**---**	**---**
		WLOR	Truck Loading - Produced Fluid/Water (PW)	1,533 Mgal/yr			---	---	---	---	---	---	---	**---**	**---**
EUPIG	EPPIG	PIG	Pigging Operations	624 Events/yr	---	8,760	---	0.02	0.02	3.04	76.01	---	---	**17.36**	**76.03**
APCFLARE	APCFLARE	FLR	Dehydrator/Stabilizer Flare (Combustion Only)	5.00 MMBtu/hr	---	8,760	5.00	2,576	2,576	0.05	1.23	0.05	14.08	**591.73**	**2,592**
			Miller Compressor Station - Point Sources				**141.63**	**99,500**	**99,500**	**659.18**	**16,480**	**0.54**	**160.62**	**26,516**	**116,140**
Miller Compressor Station - Fugitives															
EUFUG	EPFUG	FUG-G	Piping & Equip Leaks - Gas/Vapor	7,472 Units	LDAR	8,760	---	0.12	0.12	65.99	1,650	---	---	**376.70**	**1,650**
		FUG-L	Piping & Equip Leaks - Light Liquid/Oil	2,271 Units		8,760	---	---	---	---	---	---	---	**---**	**---**
			Miller Compressor Station - Fugitives				**---**	**0.12**	**0.12**	**65.99**	**1,650**	**---**	**---**	**376.70**	**1,650**
Miller Compressor Station - Total															
			Miller Compressor Station - Total				**141.63**	**99,500**	**99,500**	**725.17**	**18,129**	**0.54**	**160.62**	**26,893**	**117,790**

* lb/hr is based on 8,760 hr/yr, including: Compressor Blowdowns (BD), Condensate Stabilizer (STAB), Truck Load-Out (LOR and WLOR), and Pigging Operations (PIG).

	CO2 tpy	CO2e tpy	CH4 tpy	CO2e tpy	N2O tpy	CO2e tpy	TOTAL CO2e lb/hr*	TOTAL CO2e tpy
Current Permit Total	**99,500**	**99,500**	**679.74**	**16,993**	**0.54**	**160.62**	**26,633**	**116,654**
Increase/(Decrease)	**0**	**0**	**45.44**	**1,136**	**0.00**	**0.00**	**259**	**1,136**
% Change	**0%**	**0%**	**7%**	**7%**	**0%**	**0%**	**1%**	**1%**

Compressor Engine (CE-02 and CE-04)

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
	Compressor Engine 02 and 04 (Each) (NSCR-02 and NSCR-04)	Vendor Data	NOX	11.54	3.11	48.34	211.72	97.4%	0.30	**1.26**	**5.50**
		Vendor Data	CO	9.63	2.60	40.34	176.68	93.9%	0.59	**2.47**	**10.82**
		Vendor Data	NMNEHC	0.05	0.01	0.21	0.90	50.0%	0.025	**0.10**	**0.45**
		Sum	VOC (w/Aldehyde)	0.35	0.03	0.50	2.19	86.7%	0.05	**0.20**	**0.85**
	Waukesha L7044 GSI (4SRB)	AP-42 Table 3.2-2	PM10/2.5	7.20E-02	1.94E-02	0.30	1.32	---	7.20E-02	**0.30**	**1.32**
		AP-42 Table 3.2-2	SO2	2.18E-03	5.88E-04	0.01	0.04	---	2.18E-03	**0.01**	**0.04**
	1,900 bhp (Each)	AP-42 Table 3.2-2	*Acetaldehyde	1.04E-02	2.79E-03	0.04	0.19	50.0%	5.18E-03	**0.02**	**0.09**
	8,760 hr/yr (Each)	AP-42 Table 3.2-2	*Acrolein	9.76E-03	2.63E-03	0.04	0.18	50.0%	4.88E-03	**0.02**	**0.09**
	1,200 rpm, 16 cyl	AP-42 Table 3.2-2	Benzene	5.86E-03	1.58E-03	0.02	0.11	50.0%	2.93E-03	**0.01**	**0.05**
	7,040 in3 Displacement	AP-42 Table 3.2-2	Butadiene, 1,3-	2.46E-03	6.63E-04	0.01	0.05	50.0%	1.23E-03	**5E-03**	**0.02**
	440 in3/cyl	AP-42 Table 3.2-2	Ethylbenzene	9.20E-05	2.48E-05	4E-04	2E-03	50.0%	4.60E-05	**2E-04**	**8E-04**
CE-02 CE-04		Vendor Data	*Formaldehyde	0.050	1.35E-02	0.21	0.92	76.0%	1.20E-02	**0.05**	**0.22**
	1,136 Exhaust Temp (oF)	AP-42 Table 3.2-2	n-Hexane	---	---	---	---	---	---	---	---
(Each)	8,667 Exhaust Flow (acfm)	AP-42 Table 3.2-2	Methanol	1.14E-02	3.06E-03	0.05	0.21	50.0%	5.68E-03	**0.02**	**0.10**
		AP-42 Table 3.2-2	POM	8.83E-04	2.38E-04	4E-03	0.02	50.0%	4.42E-04	**2E-03**	**0.01**
	Manufactured ≥ 07/01/10	AP-42 Table 3.2-2	Toluene	2.07E-03	5.58E-04	0.01	0.04	50.0%	1.04E-03	**4E-03**	**0.02**
	NSPS JJJJ Affected	AP-42 Table 3.2-2	TMP, 2,2,4-	---	---	---	---	---	---	---	---
		AP-42 Table 3.2-2	Xylenes	7.23E-04	1.95E-04	3E-03	0.01	50.0%	3.62E-04	**2E-03**	**0.01**
	8,179 Btu/bhp-hr (HHV)	AP-42 Table 3.2-2	Other/Trace HAP	6.65E-04	1.79E-04	3E-03	0.01	50.0%	3.32E-04	**1E-03**	**0.01**
	15.54 MMBtu/hr (HHV) (Each)	Sum	Total HAP	9.42E-02	2.54E-02	0.39	1.73	63.8%	0.03	**0.14**	**0.63**
	15,235 scf/hr (Each)	Vendor Data	CO2 (GWP=1)	465.00	125.34	1,948	8,531	---	465.00	**1,948**	**8,531**
	133.46 MMscf/yr (Each)	Vendor Data	CH4 (GWP=25)	0.24	2.30E-01	1.01	4.40	---	0.24	**1.01**	**4.40**
	1,020 Btu/scf (HHV)	40CFR98 Table C2	N2O (GWP=298)	8.18E-04	2.20E-04	3E-03	0.02	---	8.18E-04	**3E-03**	**0.02**
		Weighted Sum	CO2e	471.24	131.15	1,974	8,646	---	471.24	**1,974**	**8,646**

* = Aldehyde

Notes:

1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr (Each).

2 - As per vendor specifications, NMNEHC (non-methane/non-ethane hydrocarbons) do NOT include aldehydes. VOC is the sum of NMNEHC, Acetaldehyde, Acrolein, and Formaldehyde (HCHO).

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

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

5 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate. (It does NOT impact the emission estimates.)

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

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

[a]Owners and operators of stationary non-certified SI engines may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15 percent O2.

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

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

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

Compressor Engine (CE-03, CE-05 and CE-06)

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr (ave)	tpy		g/bhp-hr	lb/hr (ave)	tpy
CE-03 CE-05 CE-06 (Each)	Compressor Engine 03, 05 and 06 (Each) (NSCR-03, NSCR-05 and NSCR-06) Waukesha L5794 GSI (4SRB) 1,380 bhp (Each) 8,760 hr/yr (Each) 1,200 rpm, 16 cyl 7,040 in3 Displacement 440 in3/cyl 1,149 Exhaust Temp (oF) 6,525 Exhaust Flow (acfm) Manufactured ≥ 07/01/10 NSPS JJJJ Affected 7,510 Btu/bhp-hr (HHV) 10.36 MMBtu/hr (HHV) (Each) 10,161 scf/hr (Each) 89.01 MMscf/yr (Each) 1,020 Btu/scf (HHV)	Vendor Data	NOX	13.90	4.08	42.29	185.23	96.5%	0.49	**1.48**	**6.48**
		Vendor Data	CO	8.80	2.58	26.77	117.27	93.3%	0.59	**1.81**	**7.92**
		Vendor Data	NMNEHC	0.30	0.09	0.91	4.00	84.5%	0.05	**0.14**	**0.62**
		Sum	VOC (w/Aldehyde)	0.37	0.11	1.12	4.91	84.5%	0.06	**0.17**	**0.76**
		AP-42 Table 3.2-2	PM10/2.5	6.61E-02	1.94E-02	0.20	0.88	---	0.07	**0.20**	**0.88**
		AP-42 Table 3.2-2	SO2	2.00E-03	5.88E-04	0.01	0.03	---	2E-03	**0.01**	**0.03**
		AP-42 Table 3.2-2	*Acetaldehyde	9.50E-03	2.79E-03	0.03	0.13	84.5%	1E-03	**4E-03**	**0.02**
		AP-42 Table 3.2-2	*Acrolein	8.96E-03	2.63E-03	0.03	0.12	84.5%	1E-03	**4E-03**	**0.02**
		AP-42 Table 3.2-2	Benzene	5.38E-03	1.58E-03	0.02	0.07	84.5%	8E-04	**3E-03**	**0.01**
		AP-42 Table 3.2-2	Butadiene, 1,3-	2.26E-03	6.63E-04	0.01	0.03	84.5%	4E-04	**1E-03**	**5E-03**
		AP-42 Table 3.2-2	Ethylbenzene	8.45E-05	2.48E-05	3E-04	1E-03	84.5%	1E-05	**4E-05**	**2E-04**
		Vendor Data	*Formaldehyde	5.00E-02	1.47E-02	0.15	0.67	84.5%	0.01	**0.02**	**0.10**
		AP-42 Table 3.2-2	n-Hexane	---	---	---	---	---	---	**---**	**---**
		AP-42 Table 3.2-2	Methanol	1.04E-02	3.06E-03	0.03	0.14	84.5%	2E-03	**5E-03**	**0.02**
		AP-42 Table 3.2-2	POM	8.11E-04	2.38E-04	2E-03	0.01	84.5%	1E-04	**4E-04**	**2E-03**
		AP-42 Table 3.2-2	Toluene	1.90E-03	5.58E-04	0.01	0.03	84.5%	3E-04	**9E-04**	**4E-03**
		AP-42 Table 3.2-2	TMP, 2,2,4-	---	---	---	---	84.5%	---	**---**	**---**
		AP-42 Table 3.2-2	Xylenes	6.64E-04	1.95E-04	2E-03	0.01	84.5%	1E-04	**3E-04**	**1E-03**
		AP-42 Table 3.2-2	Other/Trace HAP	6.10E-04	1.79E-04	2E-03	0.01	84.5%	9E-05	**3E-04**	**1E-03**
		Sum	Total HAP	9.06E-02	2.66E-02	0.28	1.21	84.5%	0.01	**0.04**	**0.19**
		Vendor Data	CO2 (GWP=1)	527.00	154.71	1,603	7,023	---	527.00	**1,603**	**7,023**
		AP-42 Table 3.2-2	CH4 (GWP=25)	7.83E-01	2.30E-01	2.38	10.44	---	0.78	**2.38**	**10.44**
		40CFR98 Table C2	N2O (GWP=298)	7.51E-04	2.20E-04	2E-03	0.01	---	8E-04	**2E-03**	**0.01**
		Weighted Sum	CO2e	546.81	160.52	1,664	7,287	---	546.81	**1,664**	**7,287**

* = Aldehyde

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr (Each).
2 - As per vendor specifications, NMNEHC (non-methane/non-ethane hydrocarbons) do NOT include aldehydes. VOC is the sum of NMNEHC, Acetaldehyde, Acrolein, and Formaldehyde (HCHO).
3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
4 - "Other/Trace HAPs" includes: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloro-propene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).
5 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate. (It does NOT impact the emission estimates.)

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

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

[a]Owners and operators of stationary non-certified SI engines may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15 percent O2.
[b]Owners and operators of new or reconstructed non-emergency lean burn SI stationary engines with a site rating of greater than or equal to 250 brake HP located at a major source that are meeting the requirements of 40 CFR part 63, subpart ZZZZ, Table 2a do not have to comply with the CO emission standards of Table 1 of this subpart.
[c]The emission standards applicable to emergency engines between 25 HP and 130 HP are in terms of NO_x + HC.
[d]For purposes of this subpart, when calculating emissions of volatile organic compounds, emissions of formaldehyde should not be included.

Compressor Engine (CE-07, CE-08, and CE-12 thru CE-15)

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
CE-07 CE-08 CE-12 CE-13 CE-14 CE-15 (Each)	Compressor Engine 07, 08, and 12 thru 15 (OxCat-07, 08, and 12 thru 15) Caterpillar (CAT) G3516B (4SLB) 1,380 bhp (Each) 8,760 hr/yr (Each) 1,400 rpm, 16 cyl 4,230 in3 Displacement 264 in3/cyl 995 Exhaust Temp (oF) 9,156 Exhaust Flow (acfm) Manufactured ≥ 07/01/10 NSPS JJJJ Affected 8,226 Btu/bhp-hr (HHV) 11.35 MMBtu/hr (HHV) (Each) 11,129 scf/hr (Each) 97.49 MMscf/yr (Each) 1,020 Btu/scf (HHV)	Vendor Data	NOX	0.50	0.13	1.52	6.66	---	0.50	**1.52**	**6.66**
		Vendor Data	CO	2.71	0.73	8.24	36.11	81.5%	0.50	**1.52**	**6.66**
		Vendor Data	NMNEHC	0.48	0.13	1.46	6.40	45.8%	0.26	**0.79**	**3.46**
		Sum	VOC (w/Aldehyde)	0.96	0.26	2.92	12.80	59.3%	0.39	**1.19**	**5.20**
		AP-42 Table 3.2-2	PM10/2.5	3.73E-02	9.99E-03	0.11	0.50	---	0.04	**0.11**	**0.50**
		AP-42 Table 3.2-2	SO2	2.19E-03	5.88E-04	0.01	0.03	---	2E-03	**0.01**	**0.03**
		AP-42 Table 3.2-2	*Acetaldehyde	3.12E-02	8.36E-03	0.09	0.42	45.8%	0.02	**0.05**	**0.23**
		AP-42 Table 3.2-2	*Acrolein	1.92E-02	5.14E-03	0.06	0.26	45.8%	0.01	**0.03**	**0.14**
		AP-42 Table 3.2-2	Benzene	1.64E-03	4.40E-04	5E-03	0.02	45.8%	9E-04	**3E-03**	**0.01**
		AP-42 Table 3.2-2	Butadiene, 1,3-	9.96E-04	2.67E-04	3E-03	0.01	45.8%	5E-04	**2E-03**	**0.01**
		AP-42 Table 3.2-2	Ethylbenzene	1.48E-04	3.97E-05	5E-04	2E-03	45.8%	8E-05	**2E-04**	**1E-03**
		Vendor Data	*Formaldehyde	0.43	0.12	1.31	5.73	76.0%	0.10	**0.31**	**1.38**
		AP-42 Table 3.2-2	n-Hexane	4.14E-03	1.11E-03	0.01	0.06	45.8%	2E-03	**0.01**	**0.03**
		AP-42 Table 3.2-2	Methanol	9.33E-03	2.50E-03	0.03	0.12	45.8%	0.01	**0.02**	**0.07**
		AP-42 Table 3.2-2	POM	1.39E-03	3.74E-04	4E-03	0.02	45.8%	8E-04	**2E-03**	**0.01**
		AP-42 Table 3.2-2	Toluene	1.52E-03	4.08E-04	5E-03	0.02	45.8%	8E-04	**3E-03**	**0.01**
		AP-42 Table 3.2-2	TMP, 2,2,4-	9.33E-04	2.50E-04	3E-03	0.01	45.8%	5E-04	**2E-03**	**0.01**
		AP-42 Table 3.2-2	Xylenes	6.87E-04	1.84E-04	2E-03	0.01	45.8%	4E-04	**1E-03**	**5E-03**
		AP-42 Table 3.2-2	Other/Trace HAP	1.20E-03	3.21E-04	4E-03	0.02	45.8%	6E-04	**2E-03**	**0.01**
		Sum	Total HAP	0.50	0.13	1.53	6.69	71.7%	0.14	**0.43**	**1.90**
		Vendor Data	CO2 (GWP=1)	527.00	141.24	1,603	7,023	---	527.00	**1,603**	**7,023**
		AP-42 Table 3.2-2	CH4 (GWP=25)	4.66	1.25	14.19	62.15	---	4.66	**14.19**	**62.15**
		40CFR98 Table C2	N2O (GWP=298)	8.23E-04	2.20E-04	3E-03	0.01	---	8E-04	**3E-03**	**0.01**
		Weighted Sum	CO2e	644	173	1,959	8,580	---	643.85	**1,959**	**8,580**

* = Aldehyde

Notes:

1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr (Each).

2 - As per vendor specifications, NMNEHC (non-methane/non-ethane hydrocarbons) do NOT include aldehydes. VOC is the sum of NMNEHC, Acetaldehyde, Acrolein, and Formaldehyde (HCHO).

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

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

5 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate. (It does NOT impact the emission estimates.)

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

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

[a]Owners and operators of stationary non-certified SI engines may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15 percent O2.

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

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

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

Compressor Blowdown/Emergency Shutdown Testing (BD)

Source ID	Unit Description	Site Rating	Blowdown and ESD	Blowdown Gas	Total Gas Vented	Control %	VOC 8,200 lb/MMscf		CO2 300 lb/MMscf		CH4 39,800 lb/MMscf		CO2e CH4 GWP = 25	
		bhp	Events/yr	scf/bhp	MMscf/yr		lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
BD	Compressor 02	1,900	52	4.71	0.47	na	0.44	1.91	0.02	0.07	2.11	9.26	52.87	231.59
	Compressor 03	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 04	1,900	52	4.71	0.47		0.44	1.91	0.02	0.07	2.11	9.26	52.87	231.59
	Compressor 05	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 06	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 07	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 08	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 12	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 13	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 14	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Compressor 15	1,380	52	4.71	0.34		0.32	1.39	0.01	0.05	1.54	6.73	38.40	168.21
	Emergency Shutdown (ESD) Test	16,220	2	14.13	0.46		0.43	1.88	0.02	0.07	2.08	9.12	52.08	228.12
*lb/hr is tpy averaged over 8,760 hr/yr	**TOTAL:**	**574**	**TOTAL:**		**4.43**	**TOTAL:**	**4.15**	**18.17**	**TOTAL:**	**0.02**	**0.66**	**2.11**	**88.18**	**52.87**	**2,205**
	Pre-Controlled:						4.15	18.17		0.02	0.66	2.11	88.18	52.87	2,205

Source ID	Unit Description	Benzene 25.00 lb/MMscf		Ethylbenzene 25.00 lb/MMscf		n-Hexane 125.00 lb/MMscf		Methanol 100.00 lb/MMscf		Toluene 25.00 lb/MMscf		2,2,4-TMP 25.00 lb/MMscf		Xylene 25.00 lb/MMscf		Total HAP 350.00 lb/MMscf	
		lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
BD	Compressor 02	1E-03	6E-03	1E-03	6E-03	0.01	0.03	5E-03	0.02	1E-03	6E-03	1E-03	6E-03	1E-03	6E-03	0.02	0.08
	Compressor 03	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 04	1E-03	6E-03	1E-03	6E-03	0.01	0.03	5E-03	0.02	1E-03	6E-03	1E-03	6E-03	1E-03	6E-03	0.02	0.08
	Compressor 05	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 06	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 07	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 08	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 12	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 13	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 14	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Compressor 15	1E-03	4E-03	1E-03	4E-03	5E-03	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
	Emergency Shutdown (ESD) Test	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
*lb/hr is tpy averaged over 8,760 hr/yr	**TOTAL:**	**0.01**	**0.06**	**0.01**	**0.06**	**0.06**	**0.28**	**0.05**	**0.22**	**0.01**	**0.06**	**0.01**	**0.06**	**0.01**	**0.06**	**0.18**	**0.78**
	Pre-Controlled:	0.01	0.06	0.01	0.06	0.06	0.28	0.05	0.22	0.01	0.06	0.01	0.06	0.01	0.06	0.18	0.78

Notes: 1 - The results of a representative **Inlet ("Wet") Gas Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency: 15%		
Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
CO2	195 lb/MMscf	**300 lb/MMscf**	0.58	0.04
Methane (CH4)	34,560 lb/MMscf	**39,800 lb/MMscf**	76.54	4.85
N2/Water/Ethane/Etc	10,155 lb/MMscf	**3,700 lb/MMscf**	7.12	0.45
VOC	7,049 lb/MMscf	**8,200 lb/MMscf**	15.77	1.00
TOTAL Gas	51,959 lb/MMscf	**52,000 lb/MMscf**	100.00	---

Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
Benzene	2.06 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Ethylbenzene	0.28 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
n-Hexane	104.58 lb/MMscf	**125.00 lb/MMscf**	0.24	1.52
Methanol	84.35 lb/MMscf	**100.00 lb/MMscf**	0.19	1.22
Toluene	2.43 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
2,2,4-TMP	2.41 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Xylenes	6.99 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Total HAP	203.09 lb/MMscf	**350.00 lb/MMscf**	0.67	4.27

2 - scf/bhp based on "Maximum Volume" of 6,500 scf per 1,380 bhp engine blowdown.
(6,500 scf / 1,380 bhp = 4.71 scf/bhp - Reference prior application.)

Compressor Rod Packing (CRP)

Source ID	Unit Description (Compressor Rod Packing)	No of Cylinders	scfh per Cylinder	Contin-gency	Total Fugitive Leak Rate		Control Efficiency	VOC 8,200 lb/MMscf	
					scfh	MMscfy		lb/hr (ave)	tpy
CRP	Compressor 02	4	12.0	15%	55.20	0.48	na	0.45	1.98
	Compressor 03	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 04	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 05	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 06	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 07	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 08	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 12	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 13	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 14	4	12.0	15%	55.20	0.48		0.45	1.98
	Compressor 15	4	12.0	15%	55.20	0.48		0.45	1.98
*lb/hr is tpy averaged over 8,760 hr/yr							**TOTAL:**	**4.98**	**21.81**
								4.98	21.81

Source ID	Unit Description (Compressor Rod Packing)	CO2 300.00 lb/MMscf		CH4 39,800.00 lb/MMscf		CO2e CH4 GWP = 25	
		lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
CRP	Compressor 02	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 03	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 04	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 05	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 06	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 07	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 08	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 12	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 13	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 14	0.02	0.07	2.20	9.62	54.94	240.64
	Compressor 15	0.02	0.07	2.20	9.62	54.94	240.64
TOTAL:		**0.18**	**0.80**	**24.17**	**105.85**	**604.35**	**2,647**
		0.18	0.80	24.17	105.85	604.35	2,647

Source ID	Unit Description (Compressor Rod Packing)	Benzene 25.00 lb/MMscf		E-Benzene 25.00 lb/MMscf		n-Hexane 125.00 lb/MMscf		Methanol 100.00 lb/MMscf		Toluene 25.00 lb/MMscf		2,2,4-TMP 25.00 lb/MMscf		Xylene 25.00 lb/MMscf		Tot HAP 350.00 lb/MMscf	
		lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy	lb/hr (ave)	tpy
CRP	Compressor 02	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 03	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 04	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 05	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 06	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 07	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 08	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 12	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 13	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 14	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
	Compressor 15	1E-03	0.01	1E-03	0.01	0.01	0.03	0.01	0.02	1E-03	0.01	1E-03	0.01	1E-03	0.01	0.02	0.08
TOTAL:		**0.02**	**0.07**	**0.02**	**0.07**	**0.08**	**0.33**	**0.06**	**0.27**	**0.02**	**0.07**	**0.02**	**0.07**	**0.02**	**0.07**	**0.21**	**0.93**
		0.02	0.07	0.02	0.07	0.08	0.33	0.06	0.27	0.02	0.07	0.02	0.07	0.02	0.07	0.21	0.93

Notes:

1 - Compressor Rod Packing (CRP) is a significant source of emissions; however, these emissions have not been included in previous applications.

2 - As per the manufacturer (Ariel): "Packing in new and broken-in condition will leak 5-10 scfh through the vent. This leakage rate will increase over time due to wear of the non-metallic sealing rings."
The Williams' engineering department provides a conservative leak rate of 12 scfh/cylinder (equal to 48 scfh/compressor). An additional 15% contingency has been added.

3 - The results of a representative **Inlet ("Wet") Gas Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency: 15%		
Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
CO2	194.76 lb/MMscf	**300.00 lb/MMscf**	0.58	---
Methane (CH4)	34,560 lb/MMscf	**39,800 lb/MMscf**	76.54	---
N2/Water/Ethane/Etc	10,155 lb/MMscf	**3,700 lb/MMscf**	7.12	---
VOC	7,049 lb/MMscf	**8,200 lb/MMscf**	15.77	100.00
TOTAL Gas	51,959 lb/MMscf	**52,000 lb/MMscf**	100.00	100.00

Pollutant	Wet Gas	Worst Case	%Total	%VOC
Benzene	2.06 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Ethylbenzene	0.28 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
n-Hexane	104.58 lb/MMscf	**125.00 lb/MMscf**	0.24	1.52
Methanol	84.35 lb/MMscf	**100.00 lb/MMscf**	0.19	1.22
Toluene	2.43 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
2,2,4-TMP	2.41 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Xylenes	6.99 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Total HAP	203.09 lb/MMscf	**350.00 lb/MMscf**	0.67	4.27

Engine Start-up (ESU)

Source ID	Unit ID	Unit Description (Engine Start-Up	BHP Rating	Events/yr	scf/Event	Total Gas Vented MMscf/yr	VOC 8,200 lb/MMscf lb/hr*	VOC tpy	CO2 300 lb/MMscf-Leg lb/hr*	CO2 tpy	CH4 39,800 lb/MMscf-Leg lb/hr*	CH4 tpy	CO2e CH4 GWP = 25 lb/hr*	CO2e tpy
ESU	CE-02	Compressor Engine 02	1,900	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-03	Compressor Engine 03	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-04	Compressor Engine 04	1,900	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-05	Compressor Engine 05	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-06	Compressor Engine 06	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-07	Compressor Engine 07	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-08	Compressor Engine 08	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-12	Compressor Engine 12	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-13	Compressor Engine 13	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-14	Compressor Engine 14	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
	CE-15	Compressor Engine 15	1,380	208	700	0.15	0.14	0.60	5E-03	0.02	0.66	2.90	16.54	72.46
* lb/hr is averaged over 8,760 hr/yr			**TOTAL:**	**2,288**		**TOTAL:**	**1.50**	**6.57**	**0.05**	**0.24**	**7.28**	**31.87**	**181.97**	**797.04**

Source ID	Unit ID	Benzene 25 lb/MMscf lb/hr*	Benzene tpy	Ethylbenzene 25 lb/MMscf lb/hr*	Ethylbenzene tpy	n-Hexane 125 lb/MMscf lb/hr*	n-Hexane tpy	Methanol 100 lb/MMscf lb/hr*	Methanol tpy	Toluene 25 lb/MMscf lb/hr*	Toluene tpy	2,2,4-TMP 25 lb/MMscf lb/hr*	2,2,4-TMP tpy	Xylene 25 lb/MMscf lb/hr*	Xylene tpy	Total HAP 350 lb/MMscf lb/hr*	Total HAP tpy
ESU	CE-02	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-03	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-04	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-05	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-06	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-07	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-08	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-12	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-13	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-14	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
	CE-15	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03
		5E-03	**0.02**	**5E-03**	**0.02**	**0.02**	**0.10**	**0.02**	**0.08**	**5E-03**	**0.02**	**5E-03**	**0.02**	**5E-03**	**0.02**	**0.06**	**0.28**

Notes:
1 - Emissions are from unburned fuel during "Cold-Start". Volume as per Engineering Department.
2 - The results of a representative Inlet ("Wet") Gas Analysis were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency:	15%	
Pollutant	**Inlet Gas**	**Worst Case**	**Wgt% Total**	**Wgt% VOC**
CO2	194.76 lb/MMscf	**300.00 lb/MMscf**	0.58%	3.66%
Methane (CH4)	34,560.16 lb/MMscf	**39,800 lb/MMscf**	76.54%	485.37%
N2/Water/Ethane/Etc	10,154.85 lb/MMscf	**3,700 lb/MMscf**	7.12%	45.12%
VOC	7,048.95 lb/MMscf	**8,200 lb/MMscf**	15.77%	100.00%
TOTAL Gas	51,958.72 lb/MMscf	**52,000 lb/MMscf**	100.00%	---

Pollutant	Inlet Gas	Worst Case	Wgt% Total	Wgt% VOC
Benzene	2.06 lb/MMscf	**25.00 lb/MMscf**	0.05%	0.30%
Ethylbenzene	0.28 lb/MMscf	**25.00 lb/MMscf**	0.05%	0.30%
n-Hexane	104.58 lb/MMscf	**125.00 lb/MMscf**	0.24%	1.52%
Methanol	84.35 lb/MMscf	**100.00 lb/MMscf**	0.19%	1.22%
Toluene	2.43 lb/MMscf	**25.00 lb/MMscf**	0.05%	0.30%
2,2,4-TMP	2.41 lb/MMscf	**25.00 lb/MMscf**	0.05%	0.30%
Xylenes	6.99 lb/MMscf	**25.00 lb/MMscf**	0.05%	0.30%
Total HAP	203.09 lb/MMscf	**350.00 lb/MMscf**	0.67%	4.27%

Engine Crankcase (ECC)

Source ID	Site Rating	Operations	G3516B Leak Rate 0.36 scf/bhp-hr MMscf/yr
CE-02	1,900 bhp	8,760 hr/yr	6.04
CE-03	1,380 bhp	8,760 hr/yr	4.39
CE-04	1,900 bhp	8,760 hr/yr	6.04
CE-05	1,380 bhp	8,760 hr/yr	4.39
CE-06	1,380 bhp	8,760 hr/yr	4.39
CE-07	1,380 bhp	8,760 hr/yr	4.39
CE-08	1,380 bhp	8,760 hr/yr	4.39
CE-12	1,380 bhp	8,760 hr/yr	4.39
CE-13	1,380 bhp	8,760 hr/yr	4.39
CE-14	1,380 bhp	8,760 hr/yr	4.39
CE-15	1,380 bhp	8,760 hr/yr	4.39
TOT:	**16,220 bhp**	**87,600 hr/yr**	**51.54**

	NOx		CO		VOC		PM		SO2	
	1.52 lb/hr		8.24 lb/hr		2.92 lb/hr		0.11 lb/hr		0.01 lb/hr	
	7.63 lb/MMscf		41.37 lb/MMscf		14.66 lb/MMscf		0.57 lb/MMscf		0.03 lb/MMscf	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-02	0.01	0.02	0.03	0.12	0.01	0.04	4E-04	2E-03	2E-05	1E-04
CE-03	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-04	5E-03	0.02	0.03	0.12	0.01	0.04	4E-04	2E-03	2E-05	1E-04
CE-05	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-06	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-07	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-08	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-12	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-13	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-14	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
CE-15	4E-03	0.02	0.02	0.09	0.01	0.03	3E-04	1E-03	2E-05	7E-05
Total:	**0.04**	**0.20**	**0.24**	**1.07**	**0.09**	**0.38**	**3E-03**	**0.01**	**2E-04**	**9E-04**
Pre-Control:	0.04	0.20	0.24	1.07	0.09	0.38	3E-03	0.01	2E-04	9E-04

	CO2		CH4		N2O		CO2e	
	1,603 lb/hr		14.19 lb/hr		2.50E-03 lb/hr		1,959 lb/hr	
	8,046 lb/MMscf		71.21 lb/MMscf		1.26E-02 lb/MMscf		9,830 lb/MMscf	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-02	5.55	24.29	0.05	0.21	9E-06	4E-05	6.77	29.67
CE-03	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-04	5.55	24.29	0.05	0.21	9E-06	4E-05	6.77	29.67
CE-05	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-06	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-07	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-08	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-12	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-13	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-14	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
CE-15	4.03	17.64	0.04	0.16	6E-06	3E-05	4.92	21.55
Total:	**47.34**	**207.34**	**0.42**	**1.84**	**7E-05**	**3E-04**	**57.83**	**253.32**
Pre-Control:	47.34	207.34	0.42	1.84	7E-05	3E-04	57.83	253.32

Source ID	Acetaldehyde 9.49E-02 lb/hr		Acrolein 5.83E-02 lb/hr		Benzene 4.99E-03 lb/hr		Butadiene 3.03E-03 lb/hr		Ethylbenzene 4.51E-04 lb/hr		HCHO 1.31E+00 lb/hr		n-Hexane 1.26E-02 lb/hr		Methanol 2.84E-02 lb/hr		POM 4.24E-03 lb/hr		Toluene 4.63E-03 lb/hr		TMP, 2,2,4- 2.84E-03 lb/hr		Xylenes 2.09E-03 lb/hr		Other/Trace 3.64E-03 lb/hr		Total HAPs 1.53 lb/hr	
	4.76E-01 lb/MMscf		2.93E-01 lb/MMscf		2.51E-02 lb/MMscf		1.52E-02 lb/MMscf		2.26E-03 lb/MMscf		6.56E+00 lb/MMscf		6.32E-02 lb/MMscf		1.42E-01 lb/MMscf		2.13E-02 lb/MMscf		2.32E-02 lb/MMscf		1.42E-02 lb/MMscf		1.05E-02 lb/MMscf		1.83E-02 lb/MMscf		7.67 lb/MMscf	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-02	3E-04	1E-03	2E-04	9E-04	2E-05	8E-05	1E-05	5E-05	2E-06	7E-06	5E-03	0.02	4E-05	2E-04	1E-04	4E-04	1E-05	6E-05	2E-05	7E-05	1E-05	4E-05	7E-06	3E-05	1E-05	6E-05	5E-03	0.02
CE-03	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-04	3E-04	1E-03	2E-04	9E-04	2E-05	8E-05	1E-05	5E-05	2E-06	7E-06	5E-03	0.02	4E-05	2E-04	1E-04	4E-04	1E-05	6E-05	2E-05	7E-05	1E-05	4E-05	7E-06	3E-05	1E-05	6E-05	5E-03	0.02
CE-05	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-06	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-07	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-08	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-12	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-13	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-14	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
CE-15	2E-04	1E-03	1E-04	6E-04	1E-05	5E-05	8E-06	3E-05	1E-06	5E-06	3E-03	0.01	3E-05	1E-04	7E-05	3E-04	1E-05	5E-05	1E-05	5E-05	7E-06	3E-05	5E-06	2E-05	9E-06	4E-05	4E-03	0.02
Total:	**3E-03**	**0.01**	**2E-03**	**0.01**	**1E-04**	**6E-04**	**9E-05**	**4E-04**	**1E-05**	**6E-05**	**0.04**	**0.17**	**4E-04**	**2E-03**	**8E-04**	**4E-03**	**1E-04**	**5E-04**	**1E-04**	**6E-04**	**8E-05**	**4E-04**	**6E-05**	**3E-04**	**1E-04**	**5E-04**	**0.05**	**0.20**
Pre-Cont:	3E-03	0.01	2E-03	0.01	1E-04	6E-04	9E-05	4E-04	1E-05	6E-05	0.04	0.17	4E-04	2E-03	8E-04	4E-03	1E-04	5E-04	1E-04	6E-04	8E-05	4E-04	6E-05	3E-04	1E-04	5E-04	0.05	0.20

Notes: 1 - As per Caterpillar's Application & Installation Guide - Crankcase Ventilation Systems:
"[B]ow-by on a new engine is approx. 0.5 ft3 /bhp-hr
and design for a worn engine should be 1.0 ft3 /bhp-hr."
http://s7d2.scene7.com/is/content/Caterpillar/CM20160713-53120-62603

2 - Blowby emission rates converted from "actual" cubic feet to "standard" cubic feet:
scf = acf * [(P+14.6959)/14.6959] * [527.67/(T+459.67)]

Actual to Standard Conversions (@ 995 oF vs. 68 oF (Ignore Δ psi):	1.0 acf =	0.36 scf

3 - Engine Exhaust Flow Rates converted from "actual" cubic feet per minute to "standard" cubic feet per minute: (scf = acf * [(P+14.6959)/14.6959] * [527.67/(T+459.67)])

Actual to Standard Conversions (@ 995 oF vs. 68 oF (Ignore Δ psi):	9,156 acfm =	3,321 scfm

Microturbine Generator (GEN-01)

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
GEN-01	Non-Emergency Microturbine Generator Capstone C600 805 bhp 8,760 hr/yr 535 Exhaust Temp (oF) 8,497 Btu/bhp-hr (HHV) 16,994 Btu/bhp-hr (HHV) x 2 13.68 MMBtu/hr (HHV) 13,412 scf/hr 117.49 MMscf/yr 1,020 Btu/scf (HHV)	Vendor Data x 2	NOX	0.27	0.04	0.48	2.10	---	**0.27**	**0.48**	**2.10**
		Vendor Data x 2	CO	0.74	0.10	1.32	5.78	---	**0.74**	**1.32**	**5.78**
		Vendor Data x 2	NMNEHC	6.76E-02	0.01	0.12	0.53	---	**0.07**	**0.12**	**0.53**
		SUM	VOC (w/HCHO)	7.93E-02	0.01	0.14	0.61	---	**0.08**	**0.14**	**0.61**
		AP-42 Table 3.1-2a x 2	PM10/2.5	1.02E-01	1.33E-02	0.18	0.79	---	**0.10**	**0.18**	**0.79**
		AP-42 Table 3.1-2a x 2	SO2	9.07E-03	1.18E-03	0.02	0.07	---	**0.01**	**0.02**	**0.07**
		AP-42 Table 3.1-3 x 2	Acetaldehyde*	6.17E-04	8.00E-05	1E-03	5E-03	---	**6E-04**	**1E-03**	**5E-03**
		AP-42 Table 3.1-3 x 2	Acrolein*	9.87E-05	1.28E-05	2E-04	8E-04	---	**1E-04**	**2E-04**	**8E-04**
		AP-42 Table 3.1-3 x 2	Benzene	1.85E-04	2.40E-05	3E-04	1E-03	---	**2E-04**	**3E-04**	**1E-03**
		AP-42 Table 3.1-3 x 2	Butadiene, 1,3-	6.63E-06	8.60E-07	1E-05	5E-05	---	**7E-06**	**1E-05**	**5E-05**
		AP-42 Table 3.1-3 x 2	Ethylbenzene	4.93E-04	6.40E-05	9E-04	4E-03	---	**5E-04**	**9E-04**	**4E-03**
		AP-42 Table 3.1-3 x 2	Formaldehyde*	1.09E-02	1.42E-03	2E-02	9E-02	---	**0.01**	**0.02**	**0.09**
		AP-42 Table 3.1-3 x 2	n-Hexane	---	---	---	---	---	**---**	**---**	**---**
		AP-42 Table 3.1-3 x 2	Methanol	---	---	---	---	---	**---**	**---**	**---**
		AP-42 Table 3.1-3 x 2	POM	5.35E-04	6.94E-05	9E-04	4E-03	---	**5E-04**	**9E-04**	**4E-03**
		AP-42 Table 3.1-3 x 2	Toluene	2.00E-03	2.60E-04	4E-03	0.02	---	**2E-03**	**4E-03**	**0.02**
		AP-42 Table 3.1-3 x 2	TMP, 2,2,4-	---	---	---	---	---	**---**	**---**	**---**
		AP-42 Table 3.1-3 x 2	Xylenes	9.87E-04	1.28E-04	2E-03	8E-03	---	**1E-03**	**2E-03**	**8E-03**
		AP-42 Table 3.1-3 x 2	Other/Trace HAP	4.47E-04	5.80E-05	8E-04	3E-03	---	**4E-04**	**8E-04**	**3E-03**
		Sum	Total HAP	1.63E-02	2.12E-03	0.03	0.13	---	**0.02**	**0.03**	**0.13**
		AP-42 Table 3.1-3 x 2	CO2 (GWP=1)	1,695.84	220.00	3,010	13,182	---	**1,696**	**3,010**	**13,182**
		AP-42 Table 3.1-3 x 2	CH4 (GWP=25)	1.33E-01	1.73E-02	0.24	1.04	---	**0.13**	**0.24**	**1.04**
		AP-42 Table 3.1-3 x 2	N2O (GWP=298)	4.63E-02	6.00E-03	0.08	0.36	---	**0.05**	**0.08**	**0.36**
		Weighted Sum	CO2e	1712.95	222.22	3,040	13,315	---	**1,713**	**3,040**	**13,315**

* = Aldehyde

Notes:

1 - The emissions estimates are based on operation at 100% of rated load for 8,760 hr/yr. Actual load and operating hours will be less.

2 - A footnote to AP-42 Table 3.4-1 indicates that "THC is based on EPA Test Method 25A" and "VOC = THC - Methane".
However, EPA Method 25A does NOT measure aldehydes (or methanol).
Accordingly, and to be conservative, total VOC is estimated by NMNEHC + aldehydes.

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

4 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.

5 - The turbine's operating load has a considerable effect on the resulting emission levels.
With reduced loads (lower than 80 percent) the NOX, CO, and THC (NMNEHC, VOC, HAP, and CH4) emissions are expected to be higher.
The vendor states that "fuel flows can be up to two times higher than steady state values."
Accordingly, and to be conservative, the vendor and AP-42 [full load, steady-state] emission factor data are increased by a factor of two (2).
(The Capstone C600 is comprised of three (3) 200 kWhe turbine generators operating in parallel, thus mininizing the low-load operations.)

Dehydrator (STL-01 thru STL-03)

Source ID	Description	Reference	Pollutant	Worst-Case PRE-Control Emissions			Control Efficiency	Worst-Case Controlled Emissions		
				lb/hr (max)	lb/hr (ave)	tpy	%	lb/hr (max)	lb/hr (ave)	tpy
STL-01 STL-02 STL-03 (Each)	Dehydrator 01 thru 03 (Each) (No Combustion Emissions Shown) 55.0 MMscfd (Each) 8,760 hr/yr (Each) 4,380 hr/yr (MeOH) Worst-case operating scenario: * Assume all flash tank off-gas is routed to the flare with 98% destruction efficiency. * Assume all still vent non-condensables are routed to the reboiler for use as fuel. 481,800 MMscf/yr (Each) 2.3 MMscf/hr (Each) NESHAP HH - Exempt (Less than 1.0 tpy Benzene)	See RBL-01 thru RBL-03 and FLR	NOX	See RBL-01 thru RBL-03 and FLR						
		See RBL-01 thru RBL-03 and FLR	CO	See RBL-01 thru RBL-03 and FLR						
		GRI-GLYCalc 4.0	NMNEHC	48.97	47.65	208.72	99.39%	**0.32**	**0.29**	**1.27**
		GRI-GLYCalc 4.0	VOC	48.97	47.65	208.72	99.33%	**0.35**	**0.32**	**1.40**
		See RBL-01 thru RBL-03 and FLR	SO2	See RBL-01 thru RBL-03 and FLR						
		See RBL-01 thru RBL-03 and FLR	PM10/2.5	See RBL-01 thru RBL-03 and FLR						
		See RBL-01 thru RBL-03 and FLR	Acetaldehyde	See RBL-01 thru RBL-03 and FLR						
		See RBL-01 thru RBL-03 and FLR	Acrolein	See RBL-01 thru RBL-03 and FLR						
		GRI-GLYCalc 4.0	Benzene	1.03	1.03	4.50	99.78%	**2E-03**	**2E-03**	**0.01**
		See RBL-01 thru RBL-03 and FLR	Butadiene, 1,3-	See RBL-01 thru RBL-03 and FLR						
		GRI-GLYCalc 4.0	Ethylbenzene	3E-05	3E-05	1E-04	99.00%	**3E-07**	**3E-07**	**1E-06**
		See RBL-01 thru RBL-03 and FLR	Formaldehyde	See RBL-01 thru RBL-03 and FLR						
		GRI-GLYCalc 4.0	n-Hexane	1.23	1.23	5.39	99.70%	**4E-03**	**4E-03**	**0.02**
		See RBL-01 thru RBL-03 and FLR	Methanol	2.64	1.32	5.78	98.00%	**0.05**	**0.03**	**0.12**
		See RBL-01 thru RBL-03 and FLR	POM	See RBL-01 thru RBL-03 and FLR						
		GRI-GLYCalc 4.0	Toluene	1.61	1.61	7.04	99.86%	**2E-03**	**2E-03**	**0.01**
		GRI-GLYCalc 4.0	TMP, 2,2,4-	0.02	0.02	0.09	88.44%	**5E-03**	**2E-03**	**0.01**
		GRI-GLYCalc 4.0	Xylenes	7.05	7.05	30.86	99.97%	**5E-03**	**2E-03**	**0.01**
		See RBL-01 thru RBL-03 and FLR	Other/Trace HAP	See RBL-01 thru RBL-03 and FLR						
		Sum	Total HAP	13.57	12.25	53.66	99.68%	**0.07**	**0.04**	**0.17**
		GRI-GLYCalc 4.0	CO2 (GWP=1)	0.92	0.92	4.03	---	**0.92**	**0.92**	**4.03**
		GRI-GLYCalc 4.0	CH4 (GWP=25)	27.82	27.82	121.84	98.13%	**0.52**	**0.52**	**2.28**
		GRI-GLYCalc 4.0	N2O (GWP=298)	See RBL-01 thru RBL-03 and FLR						
		Weighted Sum	CO2e	696.34	696.34	3,050	98.00%	**13.95**	**13.95**	**61.12**

Notes: 1 - Results of GRI-GLYCalc Model are shown below:

55.0 MMscfd DHY-01 thru DHY-03	GRI-GLYCalc Pre-Controlled Results	GRI-GLYCalc Pre-Controlled w/ 15% Margin	GRI-GLYCalc Controlled Results	GRI-GLYCalc Controlled w/ 15% Margin
VOC (w/o MeOH)	181.50 tpy	208.72 tpy	1.10 tpy	1.27 tpy
VOC (w/ MeOH)	187.28 tpy	215.38 tpy	1.22 tpy	1.40 tpy
Benzene	3.91 tpy	4.50 tpy	4E-04 tpy	0.01 tpy
Ethylbenzene	1E-04 tpy	1E-04	1E-06 tpy	1E-06
n-Hexane	4.68 tpy	5.39 tpy	0.01 tpy	0.02 tpy
Methanol (See Note 3)	5.78 tpy	5.78 tpy	0.12 tpy	0.12 tpy
Toluene	6.12 tpy	7.04 tpy	3E-04 tpy	0.01 tpy
2,2,4-TMP	0.08 tpy	0.09 tpy	2E-04 tpy	0.01 tpy
Xylenes	26.84 tpy	30.86 tpy	5E-04 tpy	0.01 tpy
Total HAP	47.42 tpy	53.66 tpy	0.13 tpy	0.17 tpy
Carbon Dioxide (CO2)	4.03 tpy	4.03 tpy	4.03 tpy	4.03 tpy
Methane (CH4)	105.95 tpy	121.84 tpy	1.99 tpy	2.28 tpy
Carbon Dioxide Equivalent (CO	2,653 tpy	3,050 tpy	53.67 tpy	61.12 tpy

*Dehydrator Operating Parameters (See Supplement S6 - Emission Program Results)			
Manufacturer:	na	Dry Gas Flow Rate:	55.0 MMscfd
Wet Gas:	80.00 oF	Gas Analysis:	08/09/18
Wet Gas:	1,000 psig	Primary Pump:	Electric
Wet Gas:	Saturated	Backup Pump:	Kimray 45020PV
Wet Gas:	58.59 lb-H2O/MMscf	Glycol Circ Rate:	15.00 gpm
Dry Gas:	7.00 lb H2O/MMscf	Glycol Circ Ratio:	7.19 gal/lb-H2O
Lean Glycol:	1.50 wt% H2O	Rich Glycol:	2.91 wt% H2O
Flash Temp:	80 oF	Regen Overhead:	2,880 scfh
Flash Press:	60 psig	Regen Control:	Cond/Comb
Flash Off-Gas:	846 scfh	Condenser Temp:	150 oF
Flash Recycle:	na	Condenser Press:	14.80 psia
Flash Control:	98%	Cond. Recycle:	100%
Stripping Gas:	na	Ambient Temp:	80 oF
Stripping Gas:	na	Condenser Vent:	293 scfh

2 - Used ProMax Process Simulation to conservatively estimate Methanol (MeOH) emissions as follows:

MeOH	Flash Tank - Pre-Control			Flash Tank - 98% Control	
Each DHY:	2.7 lb/hr (max)	1.33 lb/hr (ave)	5.78 tpy	0.03 lb/hr (ave)	0.12 tpy
Total 3 DHYs:	8.0 lb/hr (max)	3.98 lb/hr (ave)	17.35 tpy	0.08 lb/hr (ave)	0.35 tpy

(Max MeOH injection occurs for less than 6 mo/yr.)

Reboiler (RBL-01 thru RBL-03)

Source ID	Description	Reference	Pollutant	Emission Factor		Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy
RBL-01 RBL-02 RBL-03 (Each)	Reboiler 01 thru 03 (Each) 1.0 MMBtu/hr (HHV) (Each) 2,165 Btu/scf (HHV) 8,760 hr/yr (Each) 462 scf/hr (Each) 4.05 MMscf/yr (Each)	EPA AP-42 Table 1.4-1	NOX	212.22	9.80E-02	**0.10**	**0.43**
		EPA AP-42 Table 1.4-1	CO	178.26	8.24E-02	**0.08**	**0.36**
		EPA AP-42 Table 1.4-2	NMNEHC	11.51	5.32E-03	**0.01**	**0.02**
		EPA AP-42 Table 1.4-2	VOC	11.67	5.39E-03	**0.01**	**0.02**
		EPA AP-42 Table 1.4-2	PM10/2.5	16.13	7.45E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-2	SO2	1.27	5.88E-04	**6E-04**	**3E-03**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	4.46E-03	2.06E-06	**2E-06**	**9E-06**
		EPA AP-42 Table 1.4-4	Butadiene, 1,3-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	1.59E-01	7.35E-05	**7E-05**	**3E-04**
		EPA AP-42 Table 1.4-3	n-Hexane	3.82	1.76E-03	**2E-03**	**0.01**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	POM	1.48E-03	6.85E-07	**7E-07**	**3E-06**
		EPA AP-42 Table 1.4-3	Toluene	7.22E-03	3.33E-06	**3E-06**	**1E-05**
		EPA AP-42 Table 1.4-3	TMP, 2,2,4-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Xylenes	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Other/Trace HAP	2.55E-03	1.18E-06	**1E-06**	**5E-06**
		Sum	Total HAP	3.99	1.85E-03	**2E-03**	**0.01**
		EPA AP-42 Table 1.4-2	CO2 (GWP=1)	253,214	116.98	**116.98**	**512.36**
		EPA AP-42 Table 1.4-2	CH4 (GWP=25)	4.77	2E-03	**2E-03**	**0.01**
		EPA AP-42 Table 1.4-2	N2O (GWP=298)	0.48	2E-04	**2E-04**	**1E-03**
		Weighted Sum	CO2e	253,476	117.10	**117.10**	**512.89**

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr.
2 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.
3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
4 - "Other/Trace HAPs" includes: CarbonTetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

Condensate Stabilizer By-Pass (STAB)

Source ID	Unit Description	Total STAB O/H Volume	STAB O/H Routed to FLR		Pre-Control VOC 50,225 Gas lb/MMscf		FLR Control %	VOC 50,225 lb/MMscf			CO2 (w/o Control) 350 Gas lb/MMscf		CH4 16,325 Gas lb/MMscf		CO2e CH4 GWP = 25	
		scf/hr	hr/yr	Mscf/yr	lb/hr	tpy		lb/hr (max)	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
STAB	Condensate Stabilizer By-Pass	7,282	120	873.80	5.01	21.94	98.0%	7.31	0.10	0.44	0.03	0.15	0.03	0.14	0.85	3.72
* lb/hr averaged over 8,760 hr/yr.			**TOTAL:**	**873.80**	**5.01**	**21.94**	**TOTAL:**	**7.31**	**0.10**	**0.44**	**0.03**	**0.15**	**0.03**	**0.14**	**0.85**	**3.72**
							Pre-Control:	365.72	5.01	21.94	0.03	0.15	1.63	7.13	40.74	178.46

Source ID	Unit Description	Benzene 25.00 Gas lb/MMscf		Ethylbenzene 25.00 Gas lb/MMscf		n-Hexane 925.00 Gas lb/MMscf		Methanol 25.00 Gas lb/MMscf		Toluene 25 Gas lb/MMscf		2,2,4-TMP 175.00 Gas lb/MMscf		Xylene 25.00 Gas lb/MMscf		Total HAP 1,225 Gas lb/MMscf	
		lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
STAB	Condensate Stabilizer By-Pass	5E-05	2E-04	5E-05	2E-04	2E-03	0.01	5E-05	2E-04	5E-05	2E-04	3E-04	2E-03	5E-05	2E-04	2E-03	0.01
* lb/hr averaged over 8,760 hr/yr.	**TOTAL:**	**5E-05**	**2E-04**	**5E-05**	**2E-04**	**2E-03**	**0.01**	**5E-05**	**2E-04**	**5E-05**	**2E-04**	**3E-04**	**2E-03**	**5E-05**	**2E-04**	**2E-03**	**0.01**
	Pre-Control:	2E-03	0.01	2E-03	0.01	0.09	0.40	2E-03	0.01	2E-03	0.01	0.02	0.08	2E-03	0.01	0.12	0.54

Notes:

1 - The results of a representative **Condensate Stabilizer Overheads Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Analysis):

Pollutant	Wet Gas	Worst Case	%Total	%VOC
CO2	299.55 lb/MMscf	**350.00 lb/MMscf**	0.42	0.70
Methane (CH4)	14,187 lb/MMscf	**16,325 lb/MMscf**	19.67	32.50
N2/Water/Ethane/Etc	24,734 lb/MMscf	**16,100 lb/MMscf**	19.40	32.06
VOC	43,655 lb/MMscf	**50,225 lb/MMscf**	60.51	100.00
TOTAL Gas	82,924 lb/MMscf	**83,000 lb/MMscf**	100.00	---
Benzene	0.09 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
Ethylbenzene	3.66 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
n-Hexane	794.48 lb/MMscf	**925.00 lb/MMscf**	1.11	1.84
Methanol (MeOH)	1.69 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
Toluene	1.44 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
2,2,4-TMP	132.21 lb/MMscf	**175.00 lb/MMscf**	0.21	0.35
Xylenes	5.24 lb/MMscf	**25.00 lb/MMscf**	0.03	0.05
Total HAP	938.81 lb/MMscf	**1,225 lb/MMscf**	1.48	2.44

2 - The condensate stabilizer overheads will normally be captured by a vapor recovery unit and routed to the facility inlet; however, for operating flexibility and during maintenance activities, the stabilizer overheads will be sent to the flare for up to 5 days per year (i.e., 120 hours) for 98% control of the vapors.

Condensate Stabilizer – Hot-Oil Heater (OH-01)

Source ID	Description	Reference	Pollutant	Emission Factor		Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy
OH-01	Hot-Oil Heater 3.35 MMBtu/hr (HHV) 1,020 Btu/scf (HHV) 8,760 hr/yr 3,284 scf/hr 28.77 MMscf/yr	EPA AP-42 Table 1.4-1	NOX	100	9.80E-02	**0.33**	**1.44**
		EPA AP-42 Table 1.4-1	CO	84	8.24E-02	**0.28**	**1.21**
		EPA AP-42 Table 1.4-2	NMNEHC	5.43	5.32E-03	**0.02**	**0.08**
		EPA AP-42 Table 1.4-2	VOC	5.50	5.39E-03	**0.02**	**0.08**
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	7.45E-03	**0.02**	**0.11**
		EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	**2E-03**	**0.01**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	2.10E-03	2.06E-06	**7E-06**	**3E-05**
		EPA AP-42 Table 1.4-4	Butadiene, 1,3-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	7.50E-02	7.35E-05	**2E-04**	**1E-03**
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	POM	6.98E-04	6.85E-07	**2E-06**	**1E-05**
		EPA AP-42 Table 1.4-3	Toluene	3.40E-03	3.33E-06	**1E-05**	**5E-05**
		EPA AP-42 Table 1.4-3	TMP, 2,2,4-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Xylenes	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Other/Trace HAP	1.20E-03	1.18E-06	**4E-06**	**2E-05**
		Sum	Total HAP	1.88	1.85E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-2	CO2 (GWP=1)	119,317	116.98	**391.87**	**1,716**
		EPA AP-42 Table 1.4-2	CH4 (GWP=25)	2.25	2E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-2	N2O (GWP=298)	0.22	2E-04	**7E-04**	**3E-03**
		Weighted Sum	CO2e	119,440	117.10	**392.28**	**1,718**

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr.
2 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate.
3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
4 -"Other/Trace HAPs" includes: CarbonTetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

Stabilized Condensate (SC) – Storage Tank (TK-01 thru TK-10)

Source ID	Source ID	Material Stored	Capacity	T-Put	PRE-CONTROL			VRU Control Efficiency	100% VOC		CO2 (w/o Control) 0.42% Total		CH4 19.67% Total		CO2e CH4 GWP = 25	
					W+B	Flash	Total									
			bbl	bbl/yr	lb/yr	lb/yr	lb/yr		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-01-10	TK-01	Stabilized Condensate	400	27,375	11,102	---	11,102	98% (Allowance for 2% downtime)	0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-02	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-03	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-04	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-05	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-06	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-07	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-08	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-09	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
	TK-10	Stabilized Condensate	400	27,375	11,102	---	11,102		0.03	0.11	0.01	0.02	5E-03	0.02	0.13	0.57
			4,000	**273,750**			**111,021**	**TOTAL:**	**0.25**	**1.11**	**0.05**	**0.23**	**0.05**	**0.22**	**1.30**	**5.69**
								PRE-Control (Each):	1.27	5.55	0.27	1.17	0.25	1.09	6.50	28.47
								PRE-Control (Total):	12.67	55.51	2.67	11.70	2.49	10.92	64.99	284.66

bbl/day/tank: 75

Mgal/yr: 11,498

Turnovers/yr: 68.44

Source ID	Tank ID	Benzene 0.05% Total		Ethylbenzene 1.26% Total		n-Hexane 4.63% Total		Methanol 0.03% Total		Toluene 0.63% Total		2,2,4-TMP 0.43% Total		Xylene 1.64% Total		Total HAP 8.67% Total	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-01-10	TK-01	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-02	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-03	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-04	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-05	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-06	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-07	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-08	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-09	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TK-10	1E-05	5E-05	3E-04	1E-03	1E-03	5E-03	8E-06	4E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
	TOTAL:	**1E-04**	**5E-04**	**3E-03**	**0.01**	**0.01**	**0.05**	**8E-05**	**4E-04**	**2E-03**	**0.01**	**1E-03**	**5E-03**	**4E-03**	**0.02**	**0.02**	**0.10**
	PRE-Control (Each):	6E-04	3E-03	0.02	0.07	0.06	0.26	4E-04	2E-03	0.01	0.04	5E-03	0.02	0.02	0.09	0.11	0.48
	PRE-Control (Total):	0.01	0.03	0.16	0.70	0.59	2.57	4E-03	0.02	0.08	0.35	0.05	0.24	0.21	0.91	1.10	4.81

Notes: 1 - EPA TANKS 4.0.9d was used to determine working and breathing losses from each (of 10) Stabilized Condensate Storage Tanks - See Supplement S4 - Emission Programs.

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

Emissions Report for: Annual

AMS-Miller CS - Vertical Fixed Roof Tank
New Martinsville, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 15.0)	7,736.15	3,365.94	11,102.09

Produced Fluid/Water (PW) – Storage Tank (WTK-11 and WTK-12)

Source ID	Tank ID	Material Stored	Capacity	T-Put	PRE-CONTROL			VRU Control Efficiency	100% VOC		CO2 (w/o Control) 0.42% Total		CH4 19.67% Total		CO2e CH4 GWP = 25	
					W+B	Flash	Total									
			bbl	bbl/yr	lb/yr	lb/yr	lb/yr		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-11-12	WTK-11	Produced Fluid/Water	400	18,250	5,102	---	5,102	98.0%	0.01	0.05	2E-03	0.01	2E-03	0.01	0.06	0.26
	WTK-12	Produced Fluid/Water	400	18,250	5,102	---	5,102		0.01	0.05	2E-03	0.01	2E-03	0.01	0.06	0.26
			800	**36,500**			**10,204**	**TOTAL:**	**0.02**	**0.10**	**5E-03**	**0.02**	**5E-03**	**0.02**	**0.12**	**0.52**
								PRE-Control (Each):	0.58	2.55	0.12	0.54	0.11	0.50	2.99	13.08
								PRE-Control (Total):	1.16	5.10	0.25	1.08	0.23	1.00	5.97	26.16

bbl/day/tank: 50

Mgal-VOC/yr: 1,533
Turnovers: 45.63

Source ID	Tank ID	Benzene 0.05% Total		Ethylbenzene 1.26% Total		n-Hexane 4.63% Total		Methanol 0.03% Total		Toluene 0.63% Total		2,2,4-TMP 0.43% Total		Xylene 1.64% Total		Total HAP 8.67% Total	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-11-12	WTK-11	6E-06	2E-05	1E-04	6E-04	5E-04	2E-03	4E-06	2E-05	7E-05	3E-04	5E-05	2E-04	2E-04	8E-04	1E-03	4E-03
	WTK-12	6E-06	2E-05	1E-04	6E-04	5E-04	2E-03	4E-06	2E-05	7E-05	3E-04	5E-05	2E-04	2E-04	8E-04	1E-03	4E-03
	TOTAL:	**1E-05**	**5E-05**	**3E-04**	**1E-03**	**1E-03**	**5E-03**	**8E-06**	**3E-05**	**1E-04**	**6E-04**	**1E-04**	**4E-04**	**4E-04**	**2E-03**	**2E-03**	**0.01**
PRE-Control (Each):		3E-04	1E-03	0.01	0.03	0.03	0.12	2E-04	8E-04	4E-03	0.02	3E-03	0.01	0.01	0.04	0.05	0.22
PRE-Control (Total):		6E-04	2E-03	0.01	0.06	0.05	0.24	4E-04	2E-03	0.01	0.03	5E-03	0.02	0.02	0.08	0.10	0.44

Notes: 1 - EPA TANKS 4.0.9d was used to determine working and breathing losses from each (of 2) Produced Fluid/Water Storage Tanks - See Supplement S4 - Emission Programs.

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

Emissions Report for: Annual

AMS-Miller CS-Produced Fluids/Water- - Vertical Fixed Roof Tank
Bannen, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 15.0)	1,735.95	3,365.94	5,101.89

Stabilized Condensate (SC) - Truck Load-Out (LOR)

Source ID	Description	S	P	M	T	Carbon Canister	L_L	T-Put	Total Off-Gas 100.00% Total		VOC 100.00% Total	
		sat. fac.	psia	lb/lb-mol	°R	CE %	lb/Mgal	Mgal/yr	lb/hr	tpy	lb/hr	tpy
LOR	Truck Load-Out - SC	0.60	7.93	60.00	513	66.5%	2.32	11,498	3.05	13.34	3.05	13.34
* lb/hr is the averaged over 8,760 hr/yr								**TOTAL:**	**3.05**	**13.34**	**3.05**	**13.34**
								Pre-Control:	9.09	39.8	9.09	39.8

Source ID	Benzene 0.03% Total		Ethylbenzene 0.03% Total		n-Hexane 1.11% Total		Methanol 0.03% Total		Toluene 0.03% Total		2,2,4-TMP 0.21% Total		Xylene 0.03% Total		Total HAP 1.48% Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
LOR	9E-04	4E-03	9E-04	4E-03	0.03	0.15	9E-04	4E-03	9E-04	4E-03	0.01	0.03	9E-04	4E-03	0.04	0.20
TOTAL:	**9E-04**	**4E-03**	**9E-04**	**4E-03**	**0.03**	**0.15**	**9E-04**	**4E-03**	**9E-04**	**4E-03**	**0.01**	**0.03**	**9E-04**	**4E-03**	**0.04**	**0.20**
Pre-Cont:	3E-03	0.01	3E-03	0.01	0.10	0.44	3E-03	0.01	3E-03	0.01	0.02	0.08	3E-03	0.01	0.13	0.59

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

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

where: L_L = loading loss, lb/1000 gal of liquid loaded; M = molecular weight of vapors, lb/lb-mol.
S = saturation factor, use 0.60 for submerged fill.; T = temperature of bulk liquid loaded, °R = °F + 460
P = true vapor pressure of liquid loaded, psia.; CE = overall emission reduction efficiency (collection efficiency x control efficiency).

2 - For condensate loading, the collection efficiency is 70% for tanker trucks not subject to annual leak test.

3 - Emissions from loading of stabilized condensate are controlled with 95% efficient Carbon Canister

4 - Stabilized condensate (SC) vapor pressure, molecular weight, and temperature are from EPA TANKS 4.0.9d output.

5 - The total stabilized condensate storage tank capacity at the facility is: **4,000** bbl = **168,000** gal.

6 - The maxium stabilized condensate throughput at the facility is: **273,750** bbl/yr = **11,497,500** gal/yr = **68.44** t-o/yr

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

AMS-Miller CS - Vertical Fixed Roof Tank
New Martinsville, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 15.0)	All	58.50	49.32	67.67	53.39	7.9267	6.6758	9.3559	60.0000			92.00	Option 4: RVP=15, ASTM Slope=3

Produced Fluid/Water (PW) – Truck Load-Out (WLOR)

Source ID	Description	S	P	M	T	Carbon Canister	L_L	T-Put	Total Off-Gas 100.00% Total		VOC 10.00% Total	
		sat. fac.	psia	lb/lb-mol	°R	CE %	lb/Mgal	Mgal/yr	lb/hr	tpy	lb/hr	tpy
WLOR	Truck Load-Out - PW	0.60	7.93	60.00	513	66.5%	2.32	1,533	0.41	1.78	0.04	0.18
* lb/hr is the averaged over 8,760 hr/yr								**TOTAL:**	**0.41**	**1.78**	**0.04**	**0.18**
								PRE-Control:	1.21	5.31	0.12	0.53

Source ID	Benzene 0.003% Total		Ethylbenzene 0.003% Total		n-Hexane 0.111% Total		Methanol 0.003% Total		Toluene 0.003% Total		2,2,4-TMP 0.021% Total		Xylene 0.003% Total		Total HAP 0.148% Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
WLOR	1E-05	5E-05	1E-05	5E-05	5E-05	2E-04	1E-06	5E-06	1E-06	5E-06	9E-06	4E-05	1E-06	5E-06	6E-05	3E-04
TOTAL:	**1E-05**	**5E-05**	**1E-05**	**5E-05**	**5E-05**	**2E-04**	**1E-06**	**5E-06**	**1E-06**	**5E-06**	**9E-06**	**4E-05**	**1E-06**	**5E-06**	**6E-05**	**3E-04**
PRE-Cont:	4E-05	2E-04	4E-05	2E-04	1E-04	6E-04	4E-06	2E-05	4E-06	2E-05	3E-05	1E-04	4E-06	2E-05	2E-04	8E-04

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

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

where: L_L = loading loss, lb/1000 gal of liquid loaded; S = saturation factor, use 0.60 for submerged fill.; P = true vapor pressure of liquid loaded, psia.; M = molecular weight of vapors, lb/lb-mol.; T = temperature of bulk liquid loaded, °R = °F + 460; CE = overall emission reduction efficiency (collection efficiency x control efficiency).

2 - For produced fluid/water loading, the collection efficiency is 70% for tanker trucks not subject to annual leak test.

3 - Emissions from loading of stabilized condensate are controlled with 95% efficient Carbon Canister

4 - Stabilized condensate (SC) vapor pressure, molecular weight, and temperature are from EPA TANKS 4.0.9d output.

5 - The total produced fluid/water storage tank capacity at the facility is: **800** bbl = **33,600** gal

6 - The maxium produced fluid/water throughput at the facility is: **36,500** bbl/yr = **1,533,000** gal/yr = **45.63** turn-overs/yr

Pigging Operation (PIG)

Source ID	Description	PIG Volume scf/Event	Pigging Events/yr	Total Gas/Vapor scf/yr	Control %	VOC 8,200 lb/MMscf lb/hr	VOC 8,200 lb/MMscf tpy	CO2 300.00 lb/MMscf lb/hr	CO2 300.00 lb/MMscf tpy	CH4 39,800.00 lb/MMscf lb/hr	CH4 39,800.00 lb/MMscf tpy	CO2e CH4 GWP = 25 lb/hr	CO2e CH4 GWP = 25 tpy
PIG	4" Trap (HVL PCF)	24	104	2,496	na	2E-03	0.01	9E-05	4E-04	1E-02	0.05	0.28	1.24
	4" Trap (HVL CDP)	24	104	2,496		2E-03	0.01	9E-05	4E-04	1E-02	0.05	0.28	1.24
	10" Trap (CDP)	162	104	16,848		0.02	0.07	6E-04	3E-03	0.08	0.34	1.91	8.38
	12" Trap (Discharge)	303	104	31,512		0.03	0.13	1E-03	5E-03	0.14	0.63	3.58	15.68
	16" Trap (Greene Co.)	478	104	49,712		0.05	0.20	2E-03	0.01	0.23	0.99	5.65	24.74
	16" Trap (Whiteman)	478	104	49,712		0.05	0.20	2E-03	0.01	0.23	0.99	5.65	24.74
	TOTAL:	**624**	**152,776**			**0.14**	**0.63**	**0.01**	**0.02**	**0.69**	**3.04**	**17.36**	**76.03**
	PRE-Control:					0.14	0.63	0.01	0.02	0.69	3.04	17.36	76.03

Source ID	Description	Benzene 25.00 lb/MMscf lb/hr	Benzene 25.00 lb/MMscf tpy	E-Benzene 25.00 lb/MMscf lb/hr	E-Benzene 25.00 lb/MMscf tpy	n-Hexane 125.00 lb/MMscf lb/hr	n-Hexane 125.00 lb/MMscf tpy	Methane 100.00 lb/MMscf lb/hr	Methane 100.00 lb/MMscf tpy	Toluene 25.00 lb/MMscf lb/hr	Toluene 25.00 lb/MMscf tpy	2,2,4-TMP 25.00 lb/MMscf lb/hr	2,2,4-TMP 25.00 lb/MMscf tpy	Xylene 25.00 lb/MMscf lb/hr	Xylene 25.00 lb/MMscf tpy	Tot HAP 350.00 lb/MMscf lb/hr	Tot HAP 350.00 lb/MMscf tpy
PIG	4" Trap (HVL PCF)	7E-06	3E-05	7E-06	3E-05	4E-05	2E-04	3E-05	1E-04	7E-06	3E-05	7E-06	3E-05	7E-06	3E-05	1E-04	4E-04
	4" Trap (HVL CDP)	7E-06	3E-05	7E-06	3E-05	4E-05	2E-04	3E-05	1E-04	7E-06	3E-05	7E-06	3E-05	7E-06	3E-05	1E-04	4E-04
	10" Trap (CDP)	5E-05	2E-04	5E-05	2E-04	2E-04	1E-03	2E-04	8E-04	5E-05	2E-04	5E-05	2E-04	5E-05	2E-04	7E-04	3E-03
	12" Trap (Discharge)	9E-05	4E-04	9E-05	4E-04	4E-04	2E-03	4E-04	2E-03	9E-05	4E-04	9E-05	4E-04	9E-05	4E-04	1E-03	0.01
	16" Trap (Greene Co.)	1E-04	6E-04	1E-04	6E-04	7E-04	3E-03	6E-04	2E-03	1E-04	6E-04	1E-04	6E-04	1E-04	6E-04	2E-03	0.01
	16" Trap (Whiteman)	1E-04	6E-04	1E-04	6E-04	7E-04	3E-03	6E-04	2E-03	1E-04	6E-04	1E-04	6E-04	1E-04	6E-04	2E-03	0.01
	TOTAL:	**4E-04**	**2E-03**	**4E-04**	**2E-03**	**2E-03**	**0.01**	**2E-03**	**0.01**	**4E-04**	**2E-03**	**4E-04**	**2E-03**	**4E-04**	**2E-03**	**0.01**	**0.03**
	PRE-Control:	4E-04	2E-03	4E-04	2E-03	2E-03	0.01	2E-03	0.01	4E-04	2E-03	4E-04	2E-03	4E-04	2E-03	0.01	0.03

Notes: 1 - The results of a representative **Wet Gas Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency: 15%		
Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
CO2	194.76 lb/MMscf	**300.00 lb/MMscf**	0.58	---
Methane (CH4)	34,560 lb/MMscf	**39,800 lb/MMscf**	76.54	---
N2/Water/Ethane/Etc	10,155 lb/MMscf	**3,700 lb/MMscf**	7.12	---
VOC	7,049 lb/MMscf	**8,200 lb/MMscf**	15.77	100.00
TOTAL Gas	51,959 lb/MMscf	**52,000 lb/MMscf**	100.00	---
Benzene	2.06 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Ethylbenzene	0.28 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
n-Hexane	104.58 lb/MMscf	**125.00 lb/MMscf**	0.24	1.52
Methanol	84.35 lb/MMscf	**100.00 lb/MMscf**	0.19	1.22
Toluene	2.43 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
2,2,4-TMP	2.41 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Xylenes	6.99 lb/MMscf	**25.00 lb/MMscf**	0.05	0.30
Total HAP	203.09 lb/MMscf	**350.00 lb/MMscf**	0.67	4.27

Dehydrator/Stabilizer Flare (FLR)

Source ID	Description	Reference	Pollutant	Emission Factor		Combustion Emissions			Total FLR Emissions (Combustion + 3*STL +STAB)		
				lb/MMscf	lb/MMBtu	lb/hr (max)	lb/hr (ave)	tpy	lb/hr (max)	lb/hr (ave)	tpy
FLR	Dehydrator/Stabilizer Flare Controls DHY-01 thru DHY-03 Flash-Tank and Stabilizer Overhead Emissions Site Rating 20.00 MMBtu/hr (HHV) (max) 5.00 MMBtu/hr (HHV) (ave) Current: 42.18 MMBtu/hr (HHV) 98.0% Control Efficiency 1,504 Btu/scf (HHV) 13,000 scf/hr (max) 3,250 scf/hr (ave) 312,000 scfd (max) 78,000 scfd (ave) 28.47 MMscf/yr	EPA AP-42 Table 1.4-1	NOX	147.42	0.10	**1.96**	**0.49**	**2.15**	**1.96**	**0.49**	**2.15**
		EPA AP-42 Table 13.5-1	CO	466.13	0.31	**6.20**	**1.55**	**6.79**	**6.20**	**1.55**	**6.79**
		EPA AP-42 Table 1.4-2	NMNEHC	8.00	0.01	**0.11**	**0.03**	**0.12**	**8.37**	**0.99**	**4.35**
		EPA AP-42 Table 1.4-2	VOC	8.11	0.01	**0.11**	**0.03**	**0.12**	**8.37**	**0.99**	**4.35**
		EPA AP-42 Table 1.4-2	PM10/2.5	11.20	0.01	**0.15**	**0.04**	**0.16**	**0.15**	**0.04**	**0.16**
		EPA AP-42 Table 1.4-2	SO2	8.84E-01	5.9E-04	**0.01**	**3E-03**	**0.01**	**0.01**	**3E-03**	**0.01**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	**---**	**---**	**---**	**---**	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	**---**	**---**	**---**	**---**	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	3.10E-03	2.1E-06	**4E-05**	**1E-05**	**5E-05**	**0.02**	**0.01**	**0.03**
		EPA AP-42 Table 1.4-4	1,3-Butadiene	---	---	**---**	**---**	**---**	**---**	**---**	**---**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	**---**	**---**	**---**	**0.02**	**2E-04**	**1E-03**
		EPA AP-42 Table 1.4-3	Formaldehyde	1.11E-01	7.4E-05	**1E-03**	**4E-04**	**2E-03**	**1E-03**	**4E-04**	**2E-03**
		EPA AP-42 Table 1.4-3	n-Hexane	2.65	1.8E-03	**0.04**	**0.01**	**0.04**	**0.64**	**0.03**	**0.12**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**	**---**	**0.17**	**0.08**	**0.35**
		EPA AP-42 Table 1.4-3	POM/PAH	1.03E-03	6.8E-07	**1E-05**	**3E-06**	**1E-05**	**1E-05**	**3E-06**	**1E-05**
		EPA AP-42 Table 1.4-3	Toluene	5.01E-03	3.3E-06	**7E-05**	**2E-05**	**7E-05**	**0.02**	**0.01**	**0.03**
		EPA AP-42 Table 1.4-3	2,2,4-TMP	---	---	**---**	**---**	**---**	**0.13**	**0.01**	**0.04**
		EPA AP-42 Table 1.4-3	Xylenes	---	---	**---**	**---**	**---**	**0.03**	**0.01**	**0.03**
		EPA AP-42 Table 1.4-3	Other/Trace HAP	1.77E-03	1.2E-06	**2E-05**	**6E-06**	**3E-05**	**2E-05**	**6E-06**	**3E-05**
		Sum	Total HAP	2.77	1.8E-03	**0.04**	**0.01**	**0.04**	**1.03**	**0.14**	**0.60**
		EPA AP-42 Table 1.4-2	CO2 (GWP=1)	176,898	117.65	**2,353**	**588.24**	**2,576**	**2,358**	**591.03**	**2,589**
		EPA AP-42 Table 1.4-2	CH4 (GWP=25)	3.39	2.3E-03	**0.05**	**0.01**	**0.05**	**3.99**	**1.61**	**7.04**
		EPA AP-42 Table 1.4-2	N2O (GWP=298)	3.24	2.2E-03	**0.04**	**0.01**	**0.05**	**62.03**	**0.86**	**3.77**
		Weighted Sum	CO2e	177,950	118.35	**2,367**	**591.73**	**2,592**	**20,942**	**887.48**	**3,887**

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

2 - Heat Input to Flare 03 is determined as follows:

Waste/Pilot Gas Stream	scf/hr (max)	scf/hr (ave)	Btu/scf (HHV)	MMBtu/hr (max)	MMBtu/hr (ave)	Source(s)
Dehy 01 Flash-Tank Off-Gas	850	846	1,524	1.30	1.29	See Supplements: S3 - Btu Loading, S5 - Vendor Data, and S6 - Emission Programs
Dehy 02 Flash-Tank Off-Gas	850	846	1,524	1.30	1.29	
Dehy 03 Flash-Tank Off-Gas	850	846	1,524	1.30	1.29	
Stab O/H (120 hr/yr)	7,282	100	1,832	13.34	0.18	
Purge, Fuel, and Pilot Gas	175	175	1,020	0.18	0.18	
15% Contingency	1,501	421.91	1,504	2.26	0.63	
Total Gas to Flare:	**11,508**	**3,235**	**1,504**	**19.66**	**4.86**	
	276,180 scfd	**77,632 scfd**	**Round-Up:**	**20.00**	**5.00**	
Round-Up:	**312,000 scfd**	**78,000 scfd**				

3 - The condensate stabilizer overheads will normally be captured by a vapor recovery unit and routed to the facility inlet; however, for operating flexibility and during maintenance activities, the stabilizer overheads will be sent to the flare for up to 5 days per year (i.e., 120 hours) for 98% control of the vapors.

Flare (FLR) Loading

Component	Component Btu/scf	Total Dehydrator Flash-Tank and Condensate Stabilizer By-Pass to FLR						Total Load to FLR		
		Elec Pump:	2,538 scfh (3 STL		Stab O/H	99.75 scfh (av)				
		8,760 hr/yr	22.23 MMscfyr		120 hr/yr	0.01 MMscfyr		8,760 hr/yr	2,638 scfh (ave)	
		Mole % (M% = V%)	Gas Btu/scf	lb/hr (ave)	Mole % (M% = V%)	Gas Btu/scf	lb/hr (ave)	Mole % (M% = V%)	Gas Btu/scf	lb/hr (ave)
Water	---	3.42E-02	---	1.37E-02	5.25E-02	---	2.88E-04	3.44E-02	---	1.40E-02
Carbon Dioxide	---	9.37E-01	---	9.20E-01	2.58E-01	---	3.47E-03	9.28E-01	---	9.23E-01
Nitrogen	---	2.14E-01	---	1.34E-01	3.21E-02	---	2.76E-04	2.12E-01	---	1.34E-01
Methane*	1,010	6.34E+01	640.34	2.27E+01	3.36E+01	338.95	1.65E-01	6.30E+01	636.27	2.29E+01
Ethane*	1,770	2.43E+01	430.04	1.63E+01	3.12E+01	552.43	2.87E-01	2.44E+01	431.69	1.66E+01
Propane**	2,516	7.32E+00	184.19	7.20E+00	2.89E+01	727.13	3.89E-01	7.61E+00	191.52	7.59E+00
i-Butane**	3,252	9.92E-01	32.26	1.29E+00	1.79E+00	58.34	3.20E-02	1.00E+00	32.61	1.32E+00
n-Butane**	3,262	1.75E+00	57.09	2.27E+00	2.56E+00	83.42	4.54E-02	1.76E+00	57.45	2.32E+00
Cyclopentane**	3,764	---	---	---	---	---	---	---	---	---
i-Pentane**	4,001	3.80E-01	15.20	6.11E-01	6.03E-01	24.14	1.33E-02	3.83E-01	15.32	6.24E-01
n-Pentane**	4,009	3.41E-01	13.67	5.49E-01	4.79E-01	19.21	1.06E-02	3.43E-01	13.75	5.60E-01
Cyclohexane**	4,482	1.10E-02	0.49	2.06E-02	---	---	---	1.09E-02	0.49	2.06E-02
Other Hexanes**	4,750	1.98E-01	9.41	3.81E-01	---	---	---	1.95E-01	9.28	3.81E-01
Methylcyclohexane**	5,216	1.54E-02	0.80	3.37E-02	---	---	---	1.52E-02	0.79	3.37E-02
Heptanes**	5,503	5.92E-02	3.26	1.32E-01	1.45E-01	7.97	4.43E-03	6.04E-02	3.32	1.36E-01
C8+ Heavies**	7,000	3.79E-03	0.27	1.44E-02	9.20E-03	0.64	4.79E-04	3.86E-03	0.27	1.49E-02
Benzene***	3,742	2.42E-03	0.09	4.21E-03	4.32E-05	1.6E-03	1.03E-06	2.39E-03	0.09	4.21E-03
Ethylbenzene***	5,222	1.07E-04	0.01	2.52E-04	1.31E-03	6.8E-02	4.22E-05	1.23E-04	0.01	2.94E-04
n-Hexane***	4,756	8.42E-02	4.00	1.62E-01	3.50E-01	16.64	9.22E-03	8.78E-02	4.18	1.71E-01
Methanol***	867	1.53E+01	132.64	1.33E+00	2.00E-03	1.7E-02	2.38E-06	1.51E+01	130.84	1.33E+00
Toluene***	4,475	1.80E-03	0.08	3.69E-03	5.93E-04	2.7E-02	1.67E-05	1.78E-03	0.08	3.71E-03
2,2,4-TMP (i-Octane)***	6,214	9.34E-04	0.06	2.38E-03	4.39E-02	2.73	1.53E-03	1.51E-03	0.09	3.91E-03
Xylenes***	5,209	3.79E-03	0.20	5.45E-03	1.87E-03	0.10	3.69E-05	3.76E-03	0.20	5.49E-03
		115.35	Btu/scf	lb/hr (ave)	100.00	Btu/scf	lb/hr (ave)	115.14	Btu/scf	lb/hr (ave)
			1,524	54.08		1,832	0.96		1,528	55.04
			MMBtu/hr (ave)			MMBtu/hr (ave)			Base Load - MMBtu/hr	
			3.87			0.18			4.03	
			MMBtu/hr (max)			MMBtu/hr (max)			Add Purge/Pilot - MMBtu/hr	
			3.87			13.34			0.18	
									Add Contingency - MMBtu/hr	
									0.63	
									Total Load - MMBtu/hr	
									4.84	
									Round-Up - MMBtu/hr	
									5.00	

Process Piping and Equipment Leak (FUG-G) – Gas/Vapor

Source ID	Description	Component (Unit) Type (Gas)	Unit Count	Leak Factor lb/hr/Unit	LDAR Control Credit	Controlled Leaks lb/hr	Controlled Leaks tpy	VOC 15.769 Wgt% lb/hr	VOC 15.769 Wgt% tpy	CO2 0.577 Wgt% lb/hr	CO2 0.577 Wgt% tpy	CH4 76.538 Wgt% lb/hr	CH4 76.538 Wgt% tpy	CO2e CH4 GWP = 25 lb/hr	CO2e CH4 GWP = 25 tpy
FUG-G	Process Piping and Equipment Leaks (Gas/Vapor)	Valves	1,440	9.92E-03	92%	1.14	5.01	0.18	0.79	0.01	0.03	0.87	3.83	21.88	95.81
		Pump Seals	---	5.29E-03	---	---	---	---	---	---	---	---	---	---	---
		Other	108	1.94E-02	---	2.10	9.18	0.33	1.45	0.01	0.05	1.60	7.02	40.10	175.66
		Connectors	4,699	4.41E-04	93%	0.15	0.64	0.02	0.10	8E-04	4E-03	0.11	0.49	2.78	12.16
		Flanges	1,175	8.60E-04	---	1.01	4.42	0.16	0.70	0.01	0.03	0.77	3.39	19.33	84.67
		Open-ended Lines	50	4.41E-03	---	0.22	0.97	0.04	0.15	1E-03	0.01	0.17	0.74	4.25	18.63
		TOTAL:	**7,472**				**TOTAL:**	**0.73**	**3.19**	**TOTAL:**	**0.03**	**0.12**	**3.53**	**15.47**	**88.34**	**386.93**
		PRE-Control:						3.10	13.60		0.11	0.50	15.07	65.99	376.78	1,650

Source ID	Description	Component (Unit) Type (Gas)	Benzene 0.048 Wgt% lb/hr	Benzene 0.048 Wgt% tpy	Ethylbenzene 0.048 Wgt% lb/hr	Ethylbenzene 0.048 Wgt% tpy	n-Hexane 0.240 Wgt% lb/hr	n-Hexane 0.240 Wgt% tpy	Methanol 0.192 Wgt% lb/hr	Methanol 0.192 Wgt% tpy	Toluene 0.048 Wgt% lb/hr	Toluene 0.048 Wgt% tpy	2,2,4-TMP 0.048 Wgt% lb/hr	2,2,4-TMP 0.048 Wgt% tpy	Xylenes 0.048 Wgt% lb/hr	Xylenes 0.048 Wgt% tpy	Total HAP 0.673 Wgt% lb/hr	Total HAP 0.673 Wgt% tpy
FUG-G	Process Piping and Equipment Leaks (Gas/Vapor)	Valves	5E-04	2E-03	5E-04	2E-03	3E-03	0.01	2E-03	0.01	5E-04	2E-03	5E-04	2E-03	5E-04	2E-03	0.01	0.03
		Pump Seals	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Other	1E-03	4E-03	1E-03	4E-03	0.01	0.02	4E-03	0.02	1E-03	4E-03	1E-03	4E-03	1E-03	4E-03	0.01	0.06
		Connectors	7E-05	3E-04	7E-05	3E-04	3E-04	2E-03	3E-04	1E-03	7E-05	3E-04	7E-05	3E-04	7E-05	3E-04	1E-03	4E-03
		Flanges	5E-04	2E-03	5E-04	2E-03	2E-03	0.01	2E-03	0.01	5E-04	2E-03	5E-04	2E-03	5E-04	2E-03	0.01	0.03
		Open-ended Lines	1E-04	5E-04	1E-04	5E-04	5E-04	2E-03	4E-04	2E-03	1E-04	5E-04	1E-04	5E-04	1E-04	5E-04	1E-03	0.01
		TOTAL:	**2E-03**	**0.01**	**2E-03**	**0.01**	**0.01**	**0.05**	**0.01**	**0.04**	**2E-03**	**0.01**	**2E-03**	**0.01**	**2E-03**	**0.01**	**0.03**	**0.14**
		PRE-Control:	0.01	0.04	0.01	0.04	0.05	0.21	0.04	0.17	0.01	0.04	0.01	0.04	0.01	0.04	0.13	0.58

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

2 - Gas/Vapor emissions calculated using EPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Nov 1995; Table 2-4, Oil and Gas Production Operations:

Equipment Type	Gas kg/hr	Gas lb/hr/unit	Light Liquid kg/hr	Light Liquid lb/hr/unit	Water/Oil kg/hr	Water/Oil lb/hr/unit
Valves	4.5E-03	9.92E-03	2.5E-03	5.51E-03	9.8E-05	2.16E-04
Pump Seals	2.4E-03	5.29E-03	1.3E-02	2.87E-02	2.4E-05	5.29E-05
Others	8.8E-03	1.94E-02	7.5E-03	1.65E-02	1.4E-02	3.09E-02
Connectors	2.0E-04	4.41E-04	2.1E-04	4.63E-04	1.1E-04	2.43E-04
Flanges	3.9E-04	8.60E-04	1.1E-04	2.43E-04	2.9E-06	6.39E-06
Open-Ended Lines	2.0E-03	4.41E-03	1.4E-03	3.09E-03	2.5E-04	5.51E-04

3 - "Other" components include pressure relief devices (PRD), compressors, diaphragms, drains, meters, etc.

4 - Component counts based on engineering judgment .

4 - The results of a representative **Wet Gas Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency:	15%	
Pollutant	**Wet Gas**	**Worst Case**	**Wgt%**	**VOC%**
CO2	194.76 lb/MMscf	300.00 lb/MMscf	**0.577**	---
Methane (CH4)	34,560 lb/MMscf	39,800 lb/MMscf	**76.538**	---
N2/Water/Ethane/Etc	10,155 lb/MMscf	3,700 lb/MMscf	**7.115**	---
VOC	7,049 lb/MMscf	8,200 lb/MMscf	**15.769**	100.000
TOTAL Gas	51,959 lb/MMscf	52,000 lb/MMscf	**100.000**	---
Benzene	2.06 lb/MMscf	25.00 lb/MMscf	**0.048**	0.305
Ethylbenzene	0.28 lb/MMscf	25.00 lb/MMscf	**0.048**	0.305
n-Hexane	104.58 lb/MMscf	125.00 lb/MMscf	**0.240**	1.524
Methanol	84.35 lb/MMscf	100.00 lb/MMscf	**0.192**	1.220
Toluene	2.43 lb/MMscf	25.00 lb/MMscf	**0.048**	0.305
2,2,4-TMP	2.41 lb/MMscf	25.00 lb/MMscf	**0.048**	0.305
Xylenes	6.99 lb/MMscf	25.00 lb/MMscf	**0.048**	0.305
Total HAP	203.09 lb/MMscf	350.00 lb/MMscf	**0.673**	4.268

6 - LDAR Control Credit from EPA document "Leak Detection and Repair Compliance Assistance Guidance — A Best Practices Guide" Table 4-1, 500 ppm Leak Definition (i.e., NSPS OOOOa monitoring).

Process Piping and Equipment Leak (FUG-L) – Light Liquid/Oil

Source ID	Description	Component (Unit) Type (Light Liquid)	Unit Count	Leak Factor lb/hr/Unit	LDAR Control Credit	Controlled Leaks lb/hr	Controlled Leaks tpy	VOC 100.000 Wgt% lb/hr	VOC 100.000 Wgt% tpy
FUG-L	Process Piping and Equipment Leaks (Light Liquid/Oil)	Valves	576	5.51E-03	88%	0.38	1.67	0.38	1.67
		Pump Seals	12	2.87E-02	75%	0.09	0.38	0.09	0.38
		Other	43	1.65E-02	---	0.71	3.13	0.71	3.13
		Connectors	1,296	4.63E-04	93%	0.04	0.18	0.04	0.18
		Flanges	324	2.43E-04	---	0.08	0.34	0.08	0.34
		Open-ended Lines	20	3.09E-03	---	0.06	0.27	0.06	0.27
		TOTAL:	**2,271**				**TOTAL:**	**1.36**	**5.97**
		PRE-Control:						4.97	21.78

	CO2 --- lb/hr	CO2 Wgt% tpy	CH4 --- lb/hr	CH4 Wgt% tpy	CO2e CH4 GWP = 25 lb/hr	CO2e CH4 GWP = 25 tpy
	---	---	---	---	---	---
	---	---	---	---	---	---
	---	---	---	---	---	---
	---	---	---	---	---	---
	---	---	---	---	---	---
	---	---	---	---	---	---
TOTAL:	**---**	**---**	**---**	**---**	**---**	**---**
	---	---	---	---	---	---

Source ID	Description	Component (Unit) Type (Light Liquid)	Benzene 0.049 %VOC lb/hr	Benzene tpy	Ethylbenzene 1.257 %VOC lb/hr	Ethylbenzene tpy	n-Hexane 4.632 %VOC lb/hr	n-Hexane tpy	Methanol 0.032 %VOC lb/hr	Methanol tpy	Toluene 0.633 %VOC lb/hr	Toluene tpy	2,2,4-TMP 0.430 %VOC lb/hr	2,2,4-TMP tpy	Xylenes 1.639 %VOC lb/hr	Xylenes tpy	Total HAP 8.671 %VOC lb/hr	Total HAP tpy
FUG-L	Process Piping and Equipment Leaks (Light Liquid/Oil)	Valves	2E-04	8E-04	5E-03	0.02	0.02	0.08	1E-04	5E-04	2E-03	0.01	2E-03	0.01	0.01	0.03	0.03	0.14
		Pump Seals	4E-05	2E-04	1E-03	0.00	4E-03	0.02	3E-05	1E-04	5E-04	2E-03	4E-04	2E-03	1E-03	0.01	0.01	0.03
		Other	3E-04	2E-03	0.01	0.04	0.03	0.14	2E-04	1E-03	5E-03	0.02	3E-03	0.01	0.01	0.05	0.06	0.27
		Connectors	2E-05	9E-05	5E-04	2E-03	2E-03	0.01	1E-05	6E-05	3E-04	1E-03	2E-04	8E-04	7E-04	3E-03	4E-03	0.02
		Flanges	4E-05	2E-04	1E-03	4E-03	4E-03	0.02	3E-05	1E-04	5E-04	2E-03	3E-04	1E-03	1E-03	0.01	0.01	0.03
		Open-ended Lines	3E-05	1E-04	8E-04	3E-03	3E-03	0.01	2E-05	9E-05	4E-04	2E-03	3E-04	1E-03	1E-03	4E-03	0.01	0.02
		TOTAL:	**7E-04**	**3E-03**	**0.02**	**0.08**	**0.06**	**0.28**	**4E-04**	**2E-03**	**0.01**	**0.04**	**0.01**	**0.03**	**0.02**	**0.10**	**0.12**	**0.52**
		PRE-Control:	2E-03	0.01	0.06	0.27	0.23	1.01	2E-03	0.01	0.03	0.14	0.02	0.09	0.08	0.36	0.43	1.89

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

2 - Light Liquid emissions calculated using EPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Nov 1995; Table 2-4, Oil and Gas Production Operations:

Equipment Type	Gas kg/hr	Gas lb/hr/unit	Light Liquid kg/hr	Light Liquid lb/hr/unit	Water/Oil kg/hr	Water/Oil lb/hr/unit
Valves	4.5E-03	9.92E-03	**2.5E-03**	**5.51E-03**	9.8E-05	2.16E-04
Pump Seals	2.4E-03	5.29E-03	**1.3E-02**	**2.87E-02**	2.4E-05	5.29E-05
Others	8.8E-03	1.94E-02	**7.5E-03**	**1.65E-02**	1.4E-02	3.09E-02
Connectors	2.0E-04	4.41E-04	**2.1E-04**	**4.63E-04**	1.1E-04	2.43E-04
Flanges	3.9E-04	8.60E-04	**1.1E-04**	**2.43E-04**	2.9E-06	6.39E-06
Open-Ended Lines	2.0E-03	4.41E-03	**1.4E-03**	**3.09E-03**	2.5E-04	5.51E-04

3 - "Other" components include pressure relief devices (PRD), diaphragms, drains, meters, etc.

4 - Component counts based on engineering judgment.

5 - The results of a representative **Stabilized Condensate Analysis** were used to determine the following worst-case components (See Appendix S1 - Lab Data):

		Minimum Contingency: 15%		
Pollutant	**Condensate**	**Worst Case**	**%Total**	**%VOC**
CO2	--- lb/MMscf	--- lb/MMscf	---	---
Methane (CH4)	--- lb/MMscf	--- lb/MMscf	---	---
N2/Water/Ethane/Etc	0.05 lb/MMscf	--- lb/MMscf	---	---
VOC	267,979 lb/MMscf	308,200 lb/MMscf	100.00	**100.00**
TOTAL Gas	267,979 lb/MMscf	308,200 lb/MMscf	100.00	**---**
Benzene	126.46 lb/MMscf	150.00 lb/MMscf	0.05	**0.049**
Ethylbenzene	3,354 lb/MMscf	3,875 lb/MMscf	1.26	**1.257**
n-Hexane	12,409 lb/MMscf	14,275 lb/MMscf	4.63	**4.632**
Methanol	84.35 lb/MMscf	100.00 lb/MMscf	0.03	**0.032**
Toluene	1,686 lb/MMscf	1,950 lb/MMscf	0.63	**0.633**
2,2,4-TMP	1,131 lb/MMscf	1,325 lb/MMscf	0.43	**0.430**
Xylenes	4,391 lb/MMscf	5,050 lb/MMscf	1.64	**1.639**
Total HAP	23,181 lb/MMscf	26,725 lb/MMscf	8.67	**8.671**

6 - LDAR Control Credit from EPA document "Leak Detection and Repair Compliance Assistance Guidance — A Best Practices Guide" Table 4-1, 500 ppm Leak Definition (i.e., NSPS OOOOa monitoring).

AP-42 and GHG Emission Factors

(Preferentially use test data or vendor data where available)

	Pollutant	Natural Gas-Fired Reciprocating Engines			Stationary Gas-Fired Turbines	
		AP-42 Table 3.2-1; 3.2-2; 3.2-3 07/00			AP-42 Table 3.1-1; 3.1-2a; 3.1-3 04/00	
		2SLB	4SLB	4SRB	Uncontrolled	Lean Pre-Mix#
		lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	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
	PM10/2.5 (Condensible and Filterable)	4.83E-02	9.99E-03	1.94E-02	6.63E-03	6.63E-03
	SO2 (2,000 gr-S/MMscf)	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04
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 40CFR98	Use 40CFR98	Use 40CFR98	3.00E-03	3.00E-03
	CO2e	Use 40CFR98	Use 40CFR98	Use 40CFR98	1.11E+02	1.11E+02

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

	Pollutant	Natural Gas (External) Combustion			Industrial Flares	Diesel Engines
		AP-42 Table 1.4-1; 1.4-2; 1.4-3 (<100 MMBtu/hr) 07/98			13.5-2 02/18	3.3-1; 3.3-2 10/96
		Uncontrolled	LoNOx Burners	Flue Gas Recirc	Combustion	Uncontrolled
		lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu
CRITERIA	NOx (≥100 MMBtu/hrd)	9.80E-02	4.90E-02	3.14E-02	Use Ext. Comb.	3.20E+00
	CO (≥100 MMBtu/hr)	8.24E-02	8.24E-02	8.24E-02	3.10E-01	8.50E-01
	VOC (NMNEHC w/o Aldehydes*)	5.32E-03	5.32E-03	5.32E-03		8.19E-01
	VOC (NMNEHC w/ Aldehydes*)	5.39E-03	5.39E-03	5.39E-03	Use Ext. Comb.	8.21E-01
	PM10/2.5 (Condensible and Filterable)	7.45E-03	7.45E-03	7.45E-03		3.10E-01
	SO2 (2,000 gr-S/MMscf)	5.88E-04	5.88E-04	5.88E-04		5.05E-02
HAPs	Acetaldehyde*	---	---	---		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	Use Ext. Comb.	---
	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		1.64E+02
	CH4 (GWP=25)	2.25E-03	2.25E-03	2.25E-03	Use Ext. Comb.	
	N2O (GWP=298)	2.16E-03	6.27E-04	6.27E-04		Use 40CFR98
	CO2e	Use 40CFR98	Use 40CFR98	Use 40CFR98		

40CFR98 - 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
Fuel Type	Default HHV	Carbon Dioxide	Methane	Nitrous Oxide	CO2e
		lb CO2/MMBtu	lb CH4/MMBtu	lb N2O/MMBtu	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 S4

Lab Analysis

- **S1a – Inlet ("Wet") Gas – Summary**
- **S1a' – Inlet ("Wet") Gas – Lab Analysis**
- **S1b – Stabilized Condensate – Summary**
- **S1b' – Stabilized Condensate – Lab Analysis**
- **S1c – Condensate Stabilizer (SC) Overheads – Summary**
- **S1c' – Condensate Stabilizer (SC) Overheads – ProMax Simulation**
- **S1d – Condenser Vent – Summary**
- **S1d' – Condenser Vent – GRI-GLYCalc Results**

Inlet ("Wet") Gas – Summary

Sampled: 08/09/18 (Worst-Case)

Component	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fraction (MF)	lb/MMscf (WS/UGC#)	Weight % Total	Weight % THC	Weight % VOC	GPSA-Sec 23 Component Btu/scf (HHV)	GPSA-Sec 23 Btu/scf (HHV)
Water	109-86-4	H2O	18.015	---	---	---	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	0.1681	0.074	194.76	0.3748	---	---	---	---
Nitrogen	7727-37-9	N2	28.013	0.2312	0.065	170.50	0.3281	---	---	---	---
Methane*	75-82-8	CH4	16.042	81.8333	13.115	34,560.16	66.5147	66.9855	---	1,010	826.516
Ethane*	74-84-0	C2H6	30.069	12.6132	3.789	9,984.35	19.2159	19.3520	---	1,770	223.216
Propane**	74-98-6	C3H8	44.096	3.4027	1.499	3,949.97	7.6021	7.6560	56.0363	2,516	85.619
iso-Butane**	75-28-5	i-C4H10	58.122	0.4471	0.260	684.10	1.3166	1.3259	9.7050	3,252	14.540
n-Butane**	106-97-8	n-C4H10	58.122	0.7232	0.420	1,106.56	2.1297	2.1448	15.6982	3,262	23.594
iso-Pentane**	78-78-4	i-C5H12	72.149	0.1934	0.139	367.33	0.7070	0.7120	5.2112	4,001	7.738
n-Pentane**	109-66-0	n-C5H12	72.149	0.1615	0.116	306.74	0.5904	0.5945	4.3516	4,009	6.474
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---	---	3,764	---
Cyclohexane**	110-82-7	C6H12	84.162	0.0047	0.004	10.41	0.0200	0.0202	0.1477	4,482	0.211
Other Hexanes**	Various	C6H14	86.175	0.1081	0.093	245.24	0.4720	0.4753	3.4790	4,750	5.135
Heptanes**	142-82-5	C7H16	100.205	0.0404	0.040	106.57	0.2051	0.2066	1.5119	5,503	2.223
Methylcyclohexane**	108-87-2	C7H14	98.186	0.0091	0.009	23.52	0.0453	0.0456	0.3337	5,216	0.475
C8+ Heavies**	Various	C8+	138.00 est.	0.0125	0.017	45.41	0.0874	0.0880	0.6442	7,000	0.875
Benzene***	71-43-2	C6H6	78.112	0.0010	0.001	2.06	0.0040	0.0040	0.0292	3,742	0.037
Ethylbenzene***	100-41-4	C8H10	106.165	0.0001	0.000	0.28	0.0005	0.0005	0.0040	5,222	0.005
n-Hexane***	110-54-3	C6H14	86.175	0.0461	0.040	104.58	0.2013	0.2027	1.4837	4,756	2.193
Methanol (MeOH)***	67-56-1	CH4O	32.042	0.1000	0.032	84.35	0.1623	0.1635	1.1967	866.9	0.867
Toluene***	108-88-3	C7H8	92.138	0.0010	0.001	2.43	0.0047	0.0047	0.0344	4,475	0.045
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	0.0008	0.001	2.41	0.0046	0.0047	0.0341	6,214	0.050
Xylenes***	1330-20-7	C8H10	106.165	0.0025	0.003	6.99	0.0134	0.0135	0.0991	5,209	0.130
Totals:				100.10	19.72	51,959	100.00	---	---		
THC:				99.70	19.58	51,593	99.30	100.00	---		
Total VOC:				5.25	2.67	7,049	13.57	13.66	100.00		
Total HAP:				0.15	0.08	203	0.39	0.39	2.88		

Calculated Btu/scf (HHV): 1,200

Worst-Case Btu/scf (HHV): 1,020

#UGC (Universal Gas Constant)
= 379.482 scf/lb-mol @ 60 oF and 14.6959 psia.

lb "X"/scf =
(M% of "X") x (MW of "X") / #UGC

Component	Representative Wet Gas Analysis Mole %	Wgt %	lb/MMscf	Assumed "Worst-Case" Min Margin: 15% Wgt %	lb/MMscf	Margin for Changes in Future Gas Composition
CO2	0.17	0.37	195	0.5769	300.00	54% Margin
Methane*	81.83	66.51	34,560	76.5385	39,800	15% Margin
Other (N2, C2, O2, CO, H2O)	12.84	19.54	10,155	7.1154	3,700	(64%) Margin
VOC**	5.25	13.57	7,049	15.7692	8,200	16% Margin
TOTAL GAS	100.10	100.00	51,959	100.0000	52,000	
Benzene***	0.0010	0.0040	2.06	0.0481	25.00	1116% Margin
Ethylbenzene***	0.0001	0.0005	0.28	0.0481	25.00	8845% Margin
n-Hexane***	0.0461	0.2013	104.58	0.2404	125.00	20% Margin
Methanol (MeOH)***	0.1000	0.1623	84.35	0.1923	100.00	19% Margin
Toluene***	0.0010	0.0047	2.43	0.0481	25.00	931% Margin
2,2,4-Trimethylpentane***	0.0008	0.0046	2.41	0.0481	25.00	939% Margin
Xylenes***	0.0025	0.0134	6.99	0.0481	25.00	258% Margin
Total HAP***	0.15	0.39	203	0.6731	350.00	72% Margin

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

Inlet ("Wet") Gas – Lab Analysis

Williams Quality Control Facility
Extended Analysis by GPA 2286

Sample Information

	Sample Information
Sample Name	MILLER CF INLET BEFORE SLUG CATCHER 081018
Meter Number	N/A
Effective Date	09/01/2018 10:00:00
Sample Date	08/09/2018 11:00:00
Sample Type	S
Field Remarks	None
Office Remarks	None
Sample Technician	RL
Sample Pressure, psig	220.0
Sample Temperature, deg F	69.0
Sample Bottle No.	7022
H2S, ppm	
H2S, mol%	
Analyzed By	AJS
Reported By	AJS
Calibration Name	GPA 2286 Ext Gas Analysis - LOW C1
Injection Date	2018-08-10 13:53:42
Report Date	2018-08-10 20:02:54
EZReporter Configuration File	ORSH Gas Extended Analysis - May 2016.cfgx

Component Results

Component Name	Ret. Time	Peak Area	Norm Mole%
Nitrogen	3.64	2.700	0.2312
Methane	3.46	395.538	81.8333
Carbon Dioxide	4.52	1.500	0.1681
Ethane	3.60	119.787	12.6132
Propane	3.91	48.070	3.4027
iso-Butane	4.38	8.391	0.4471
n-Butane	4.78	13.636	0.7232
Neopentane	4.98	0.211	0.0092
iso-Pentane	6.15	4.617	0.1934
n-Pentane	6.79	3.657	0.1523
Hexanes Plus	0.00	0.000	0.2263
Total:			100.0000

Wet Gas – Lab Analysis

Component	Weight%	Mole%	Volume%
Nitrogen	0.3287	0.2312	0.1350
Methane	66.6354	81.8333	73.6499
Carbon Dioxide	0.3755	0.1681	0.1523
Ethane	19.2507	12.6132	17.9076
Propane	7.6159	3.4027	4.9767
iso-Butane	1.3190	0.4471	0.7767
n-Butane	2.1335	0.7232	1.2104
Neopentane	0.0337	0.0092	0.0188
iso-Pentane	0.7083	0.1934	0.3755
n-Pentane	0.5577	0.1523	0.2931
2,2-Dimethylbutane	0.0354	0.0081	0.0179
2,3-Dimethylbutane/Cyclopentane	0.0520	0.0131	0.0244
2-Methylpentane	0.2611	0.0597	0.1315
3-Methylpentane	0.1098	0.0251	0.0544
n-Hexane	0.2016	0.0461	0.1006
2,2-Dimethylpentane	0.0005	0.0001	0.0002
Methylcyclopentane/2,4-Dimethylpentane	0.0090	0.0021	0.0040
Benzene	0.0040	0.0010	0.0015
Cyclohexane	0.0201	0.0047	0.0085
2-Methylhexane	0.0671	0.0132	0.0325
2,3-Dimethylpentane	0.0209	0.0041	0.0099
trans-1,3-Dimethylcyclopentane	0.0025	0.0005	0.0011
2,2,4-Trimethylpentane	0.0046	0.0008	0.0022
3-Ethylpentane	0.0376	0.0074	0.0177
n-Heptane	0.0737	0.0145	0.0355
cis-1,2-Dimethylcyclopentane	0.0030	0.0006	0.0013
Methylcyclohexane/1,1,3-Trimethylcyclopentane/2,2-Dimethylhexane	0.0454	0.0091	0.0194
2,5-Dimethylhexane	0.0058	0.0010	0.0028
3,3-Dimethylhexane	0.0035	0.0006	0.0016
trans-1,2-cis-3-Trimethylcyclopentane	0.0006	0.0001	0.0003
Toluene	0.0047	0.0010	0.0018
2-Methylheptane/4-Methylheptane	0.0093	0.0016	0.0044
3-Methylheptane	0.0023	0.0004	0.0011
3-Ethylhexane	0.0041	0.0007	0.0019
trans-1,2-Dimethylcyclohexane	0.0017	0.0003	0.0008
trans-1,4-Dimethylcyclohexane	0.0068	0.0012	0.0029
1,1-Dimethylcyclohexane	0.0006	0.0001	0.0003
n-Octane	0.0215	0.0037	0.0101
iso-Propylcyclopentane	0.0026	0.0004	0.0012
2,2-Dimethylheptane	0.0007	0.0001	0.0003
2,4-Dimethylheptane	0.0013	0.0002	0.0006
3,3-Dimethylheptane	0.0007	0.0001	0.0003
1,1,4-Trimethylcyclohexane	0.0006	0.0001	0.0003
Ethylbenzene	0.0005	0.0001	0.0002
2,3-Dimethylheptane	0.0013	0.0002	0.0006
p-Xylene	0.0129	0.0024	0.0049
o-Xylene	0.0005	0.0001	0.0002
n-Nonane	0.0046	0.0007	0.0021
1,2-cis,trans-3-Trimethylcyclohexane	0.0007	0.0001	0.0003
2,2-Dimethyloctane	0.0007	0.0001	0.0003
iso-Propylcyclohexane	0.0006	0.0001	0.0002
m-Ethyltoluene	0.0006	0.0001	0.0002
p-Ethyltoluene	0.0006	0.0001	0.0002
2-Methylnonane	0.0014	0.0002	0.0006
n-Decane	0.0014	0.0002	0.0006
1,4-Diethylbenzene	0.0007	0.0001	0.0003
Total:	100.0000	100.0000	100.0000

Stabilized Condensate (SC) – Summary

Sampled: Pioneer CS

Component	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fraction (MF)	lb/MMscf (WS/UGC#)	Weight % Total	Weight % THC	Weight % VOC	GPSA-Sec 23 Component Btu/scf (HHV)	GPSA-Sec 23 Btu/scf (HHV)
Water	109-86-4	H2O	18.015	---	---	---	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	---	---	---	---	---	---	---	---
Hydrogen Sulfide	2148-87-8	H2S	34.086	---	---	---	---	---	---	638	---
Nitrogen	7727-37-9	N2	28.013	---	---	---	---	---	---	---	---
Methane*	75-82-8	CH4	16.042	---	---	---	---	---	---	1,010	---
Ethane*	74-84-0	C2H6	30.069	**0.0001**	0.00002	0.05	0.00002	0.00002	---	1,770	0.001
Propane**	74-98-6	C3H8	44.096	**1.1300**	0.498	1,311.74	0.4895	0.4895	0.4895	2,516	28.433
iso-Butane**	75-28-5	i-C4H10	58.122	**1.7000**	0.987	2,601.15	0.9707	0.9707	0.9707	3,252	55.284
n-Butane**	106-97-8	n-C4H10	58.122	**9.2900**	5.394	14,214.53	5.3044	5.3044	5.3044	3,262	303.077
iso-Pentane**	78-78-4	i-C5H12	72.149	**4.3300**	3.121	8,224.16	3.0690	3.0690	3.0690	4,001	173.239
n-Pentane**	109-66-0	n-C5H12	72.149	**9.4400**	6.804	17,929.81	6.6908	6.6908	6.6908	4,009	378.440
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---	---	3,764	---
Cyclohexane**	110-82-7	C6H12	84.162	**1.2750**	1.072	2,824.89	1.0541	1.0541	1.0541	4,482	57.140
Other Hexanes**	Various	C6H14	86.175	**8.6600**	7.455	19,646.07	7.3312	7.3312	7.3312	4,750	411.376
Heptanes**	142-82-5	C7H16	100.205	**16.7567**	16.774	44,203.09	16.4950	16.4950	16.4950	5,503	922.037
Methylcyclohexane**	108-87-2	C7H14	98.186	**4.1700**	4.090	10,778.56	4.0222	4.0222	4.0222	5,216	217.503
C8+ Heavies**	Various	C8+	138.00 est.	**33.8747**	46.700	123,063.63	45.9229	45.9229	45.9229	7,000	2371.231
Benzene***	71-43-2	C6H6	78.112	**0.0615**	0.048	126.46	0.0472	0.0472	0.0472	3,742	2.301
Ethylbenzene***	100-41-4	C8H10	106.165	**1.2000**	1.273	3,353.80	1.2515	1.2515	1.2515	5,222	62.664
n-Hexane***	110-54-3	C6H14	86.175	**5.4700**	4.709	12,409.24	4.6307	4.6307	4.6307	4,756	260.153
Methanol (MeOH)***	67-56-1	CH4O	32.042	**0.1000**	0.032	84.35	0.0315	0.0315	0.0315	866.9	0.867
Toluene***	108-88-3	C7H8	92.138	**0.6950**	0.640	1,685.78	0.6291	0.6291	0.6291	4,475	31.101
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	**0.3760**	0.429	1,130.67	0.4219	0.4219	0.4219	6,214	23.363
Xylenes***	1330-20-7	C8H10	106.165	**1.5710**	1.666	4,390.69	1.6384	1.6384	1.6384	5,209	81.828
			Totals:	**100.10**	**101.69**	**267,979**	**100.00**	**---**	**---**	**Calculated Btu/scf (HHV):**	**5,380**
			THC:	**100.10**	**101.69**	**267,979**	**100.00**	**100.00**	**---**		
			Total VOC:	**100.10**	**101.69**	**267,979**	**100.00**	**100.00**	**100.00**		
			Total HAP:	**9.47**	**8.80**	**23,181**	**8.65**	**8.65**	**8.65**		

#UGC (Universal Gas Constant)
= 379.482 scf/lb-mol @ 60 oF and 14.6959 psia.

lb "X"/scf =
(M% of "X") x (MW of "X") / #UGC

Component	Representative Condensate Analysis			Assumed "Worst-Case" Min Margin: 15%		Margin for Changes in Future Condensate Composition	
	Mole %	Wgt %	lb/MMscf	Wgt %	lb/MMscf		
CO2	---	---	---	---	---	**--- Margin**	
Methane*	---	---	---	---	---	**--- Margin**	
Other (N2, C2, O2, CO, H2O)	0.0001	0.00002	0.053	---	---	**--- Margin**	
VOC**	100.10	100.00	267,979	100.00	308,200	**15% Margin**	
Total Condensate	**100.10**	**100.00**	**267,979**	**100.00**	**308,200**		
Benzene***	0.0615	0.0472	126.46	0.05	150.00	**19% Margin**	0.0487%
Ethylbenzene***	1.2000	1.2515	3,353.80	1.26	3,875	**16% Margin**	
n-Hexane***	5.4700	4.6307	12,409.24	4.63	14,275	**15% Margin**	
Methanol (MeOH)***	0.1000	0.0315	84.35	0.03	100.00	**19% Margin**	
Toluene***	0.6950	0.6291	1,685.78	0.63	1,950	**16% Margin**	
2,2,4-Trimethylpentane***	0.3760	0.4219	1,130.67	0.43	1,325	**17% Margin**	
Xylenes***	1.5710	1.6384	4,390.69	1.64	5,050	**15% Margin**	
Total HAP***	**9.47**	**8.65**	**23,181**	**8.67**	**26,725**	**15% Margin**	

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

Stabilized Condensate (SC) – Lab Analysis

Appalachia Midstream Services, LLC
PIONEER COMPRESSION FACILITY
Application for G35-D General Permit Class I Administrative Update
Attachment U - Gas Analysis

Stabilized Condensate Composition

Constituent	Mol%
Water	2.70E-09
Methane	1.57E-11
CO2	1.91E-10
Ethane	6.66E-05
Propane	1.13E+00
i-Butane	1.70E+00
n-Butane	9.29E+00
i-Pentane	4.33E+00
n-Pentane	9.44E+00
2,3-Dimethylbutane	4.83E+00
3-Methylpentane	3.83E+00
Hexane	5.47E+00
2,2-Dimethylpentane	6.94E-02
Methylcyclopentane	4.42E-01
Benzene	6.15E-02
3,3-Dimethylpentane	7.28E-02
Cyclohexane	8.33E-01
2-Methylhexane	3.54E+00
2,3-Dimethylpentane	1.10E-01
3-Methylhexane	3.37E+00
Heptane	9.07E+00
Toluene	6.95E-01
Octane	7.55E+00
Ethylbenzene	1.20E+00
o-Xylene	2.54E-01
2-Methylheptane	4.62E+00
Methylcyclohexane	4.17E+00
2,5-Dimethylhexane	6.79E-01
1,t-3-Dimethylcyclohexane	3.34E-01
Nonane	6.00E+00
n-Undecane	9.70E-01
n-Decane	3.64E+00
Dodecane	3.23E-01
Tridecane	1.05E-01
Tetradecane	3.65E-02
Pentadecane	3.00E-02
Hexadecane	8.63E-02
Heptadecane	6.20E-02
Octadecane	7.37E-02
Nonadecane	6.68E-02
Eicosane	8.65E-02
C21	2.46E-01
C22	6.64E-01
C23	1.38E+00
C24	1.65E-01
m-Xylene	6.65E-01
p-Xylene	6.52E-01
2,2,4-Trimethylpentane	3.76E-01
2,4-Dimethylpentane	2.75E-02
3-Ethylpentane	4.97E-01
2,4-Dimethylhexane	6.62E-01
trans-1,2-Dimethylcyclohexane	3.69E+00
cis-1,2-Dimethylcyclohexane	1.91E+00
cis-1,3-Dimethylcyclohexane	4.91E-01

Appalachia Midstream Services, LLC (AMS)

Miller Compressor Station

Application for 45CSR30 Title V Operating Permit

Condensate Stabilizer Overhead – Summary

Sampled: Process Simulation

Component	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Mole Fraction (MF)	lb/MMscf (WS/UGC#)	Weight % Total	Weight % THC	Weight % VOC	GPSA-Sec 23 Component Btu/scf (HHV)	GPSA-Sec 23 Btu/scf (HHV)
Water	109-86-4	H2O	18.015	**0.0525**	0.009	24.91	0.0300	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	**0.2583**	0.114	299.55	0.3612	---	---	---	---
Hydrogen Sulfide	2148-87-8	H2S	34.086	**---**	---	---	---	---	---	638	---
Nitrogen	7727-37-9	N2	28.013	**0.0321**	0.009	23.71	0.0286	---	---	---	---
Methane*	75-82-8	CH4	16.042	**33.5592**	5.384	14,186.58	17.1080	17.1802	---	1,010	338.948
Ethane*	74-84-0	C2H6	30.069	**31.2158**	9.386	24,733.71	29.8271	29.9529	---	1,770	552.426
Propane**	74-98-6	C3H8	44.096	**28.8980**	12.742	33,578.28	40.4931	40.6638	76.9172	2,516	727.131
iso-Butane**	75-28-5	i-C4H10	58.122	**1.7939**	1.043	2,747.55	3.3134	3.3273	6.2938	3,252	58.339
n-Butane**	106-97-8	n-C4H10	58.122	**2.5572**	1.486	3,916.47	4.7230	4.7429	8.9714	3,262	83.425
iso-Pentane**	78-78-4	i-C5H12	72.149	**0.6033**	0.435	1,147.00	1.3832	1.3890	2.6274	4,001	24.138
n-Pentane**	109-66-0	n-C5H12	72.149	**0.4791**	0.346	910.95	1.0985	1.1032	2.0867	4,009	19.209
Cyclopentane**	287-92-3	C5H10	70.100	**---**	---	---	---	---	---	3,764	---
Cyclohexane**	110-82-7	C6H12	84.162	**---**	---	---	---	---	---	4,482	---
Other Hexanes**	Various	C6H14	86.175	**---**	---	---	---	---	---	4,750	---
Heptanes**	142-82-5	C7H16	100.205	**0.1449**	0.145	382.58	0.4614	0.4633	0.8764	5,503	7.972
Methylcyclohexane**	108-87-2	C7H14	98.186	**---**	---	---	---	---	---	5,216	---
C8+ Heavies**	Various	C8+	138.00 est.	**9.20E-03**	0.013	33.44	0.0403	0.0405	0.0766	7,000	0.644
Benzene***	71-43-2	C6H6	78.112	**4.32E-05**	0.000	0.09	0.0001	0.0001	0.0002	3,742	0.002
Ethylbenzene***	100-41-4	C8H10	106.165	**1.31E-03**	0.001	3.66	0.0044	0.0044	0.0084	5,222	0.068
n-Hexane***	110-54-3	C6H14	86.175	**0.3499**	0.301	794.48	0.9581	0.9621	1.8199	4,756	16.640
Methanol (MeOH)***	67-56-1	CH4O	32.042	**2.00E-03**	0.001	1.69	0.0020	0.0020	0.0039	866.9	0.017
Toluene***	108-88-3	C7H8	92.138	**5.93E-04**	0.001	1.44	0.0017	0.0017	0.0033	4,475	0.027
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	**0.0439**	0.050	132.21	0.1594	0.1601	0.3029	6,214	2.729
Xylenes***	1330-20-7	C8H10	106.165	**1.87E-03**	0.002	5.24	0.0063	0.0063	0.0120	5,209	0.098
Totals:				**100.00**	**31.47**	**82,924**	**100.00**	**---**	**---**	**Calculated Btu/scf (HHV):**	**1,832**
THC:				**99.66**	**31.34**	**82,575**	**99.58**	**100.00**	**---**		
Total VOC:				**34.89**	**16.57**	**43,655**	**52.64**	**52.87**	**100.00**		
Total HAP:				**0.40**	**0.36**	**939**	**1.13**	**1.14**	**2.15**		

#UGC (Universal Gas Constant)
= 379.482 scf/lb-mol @ 60 oF and 14.6959 psia.

lb "X"/scf =
(M% of "X") x (MW of "X") / #UGC

Component	Representative STAB Overhead Analysis			Assumed "Worst-Case" Min Margin: 15%		Margin for Changes in Future STAB Overhead Composition
	Mole %	Wgt %	lb/MMscf	Wgt %	lb/MMscf	
CO2	0.26	0.36	299.55	0.42	350.00	**17% Margin**
Methane*	33.56	17.11	14,187	19.67	16,325	**15% Margin**
Other (N2, C2, O2, CO, H2O)	31.22	29.83	24,734	19.40	16,100	**--- Margin**
VOC**	34.89	52.64	43,655	60.51	50,225	**15% Margin**
Total STAB Overhead	**100.00**	**100.00**	**82,924**	**100.00**	**83,000**	
Benzene***	4.32E-05	1.07E-04	8.89E-02	0.03	25.00	**28017% Margin**
Ethylbenzene***	0.0013	0.0044	3.66	0.03	25.00	**583% Margin**
n-Hexane***	0.3499	0.9581	794.48	1.11	925.00	**16% Margin**
Methanol (MeOH)***	2E-03	2E-03	1.69E+00	0.03	25.00	**1380% Margin**
Toluene***	5.93E-04	1.74E-03	1.44	0.03	25.00	**1635% Margin**
2,2,4-Trimethylpentane***	0.0439	0.1594	132.21	0.21	175.00	**32% Margin**
Xylenes***	1.87E-03	6.32E-03	5.24	0.03	25.00	**377% Margin**
Total HAP***	**0.40**	**1.13**	**939**	**1.48**	**1,225**	**30% Margin**

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

Condensate Stabilizer Overhead – ProMax Simulation

		Total
Temperature	°F	51.7942
Pressure	psia	39.6959
Mole Fraction Vapor	%	100
Mole Fraction Light Liquid	%	0
Mole Fraction Heavy Liquid	%	0
Molecular Weight	lb/lbmol	31.4666
Mass Density	lb/ft^3	0.233841
Molar Flow	lbmol/h	19.1883
Mass Flow	lb/h	603.79
Vapor Volumetric Flow	ft^3/h	2582.06
Liquid Volumetric Flow	gpm	321.919
Std Vapor Volumetric Flow	scf/h	7281.64
Std Liquid Volumetric Flow	sgpm	2.91451
Compressibility		0.973189
Specific Gravity		1.08646
API Gravity		
Enthalpy	Btu/h	-757641
Mass Enthalpy	Btu/lb	-1254.81
Mass Cp	Btu/(lb*°F)	0.420372
Ideal Gas CpCv Ratio		1.18038
Dynamic Viscosity	cP	0.00901465
Kinematic Viscosity	cSt	2.40662
Thermal Conductivity	Btu/(h*ft*°F)	0.0125198
Surface Tension	lbf/ft	
Net Ideal Gas Heating Value	Btu/ft^3	1676.54
Net Liquid Heating Value	Btu/lb	20088.1
Gross Ideal Gas Heating Value	Btu/ft^3	1831.76
Gross Liquid Heating Value	Btu/lb	21960.8

	Total
	%
N2	0.0321244
CO2	0.258303
C1	33.5592
C2	31.2158
C3	28.898
iC4	1.79394
nC4	2.55716
iC5	0.603307
nC5	0.479147
nC6	0.34987
nC7	0.144888
nC8	0.0439231
nC9	0.00644524
nC10	0.00260448
nC11	0.000119967
nC12	2.37412e-05
nC13	2.04066e-06
nC14	2.22263e-07
nC15	0
nC16	0
Benzene	4.31974e-05
Toluene	0.000593434
m-Xylene	0.00187408
Ethylbenzene	0.00013082
Water	0.0524674
MeOH	1.96471e-08

Condenser Vent – Summary

Sampled:	GRI-GLYCalc		Recycled as Fuel in the Reboiers							GPSA-Sec 23	
Component	**CAS**	**Formula**	**Molecular Weight (MW)**	**Mole % (M% = V%)**	**Mole Fraction (MF)**	**lb/MMscf (WS/UGC#)**	**Weight % Total**	**Weight % THC**	**Weight % VOC**	**Component Btu/scf (HHV)**	**Btu/scf (HHV)**
Water	109-86-4	H2O	18.015	**11.5000**	2.072	5,457.46	4.9048	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	**3.7000**	1.628	4,289.44	3.8550	---	---	---	---
Hydrogen Sulfide	2148-87-8	H2S	34.086	**---**	---	---	---	---	---	638	---
Nitrogen	7727-37-9	N2	28.013	**0.0481**	0.013	35.49	0.0319	---	---	---	---
Methane*	75-82-8	CH4	16.042	**14.6000**	2.341	6,169.87	5.5450	6.0795	---	1,010	147.460
Ethane*	74-84-0	C2H6	30.069	**23.9000**	7.184	18,930.82	17.0136	18.6536	---	1,770	422.958
Propane**	74-98-6	C3H8	44.096	**16.8000**	7.405	19,514.47	17.5382	19.2287	25.5474	2,516	422.722
iso-Butane**	75-28-5	i-C4H10	58.122	**3.8800**	2.254	5,940.54	5.3389	5.8535	7.7771	3,252	126.178
n-Butane**	106-97-8	n-C4H10	58.122	**9.4100**	5.467	14,407.34	12.9483	14.1964	18.8614	3,262	306.992
iso-Pentane**	78-78-4	i-C5H12	72.149	**2.4800**	1.789	4,713.38	4.2360	4.6444	6.1705	4,001	99.222
n-Pentane**	109-66-0	n-C5H12	72.149	**2.8500**	2.055	5,416.59	4.8680	5.3373	7.0911	4,009	114.254
Cyclopentane**	287-92-3	C5H10	70.100	**---**	---	---	---	---	---	3,764	---
Cyclohexane**	110-82-7	C6H12	84.162	**0.6570**	0.553	1,456.58	1.3091	1.4352	1.9069	4,482	29.444
Other Hexanes**	Various	C6H14	86.175	**2.3300**	2.007	5,289.21	4.7536	5.2118	6.9244	4,750	110.682
Heptanes**	142-82-5	C7H16	100.205	**1.6000**	1.603	4,223.39	3.7957	4.1615	5.5291	5,503	88.040
Methylcyclohexane**	108-87-2	C7H14	98.186	**1.0200**	1.001	2,638.17	2.3710	2.5995	3.4538	5,216	53.202
C8+ Heavies**	Various	C8+	138.00 est.	**0.0062**	0.009	22.57	0.0203	0.0222	0.0296	7,000	0.435
Benzene***	71-43-2	C6H6	78.112	**1.2000**	0.937	2,469.17	2.2191	2.4330	3.2325	3,742	44.903
Ethylbenzene***	100-41-4	C8H10	106.165	**0.0629**	0.067	175.91	0.1581	0.1733	0.2303	5,222	3.285
n-Hexane***	110-54-3	C6H14	86.175	**1.2900**	1.111	2,928.36	2.6318	2.8855	3.8337	4,756	61.352
Methanol (MeOH)***	67-56-1	CH4O	32.042	**0.0020**	0.001	1.69	0.0015	0.0017	0.0022	866.9	0.017
Toluene***	108-88-3	C7H8	92.138	**0.9880**	0.910	2,398.00	2.1551	2.3629	3.1393	4,475	44.212
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	**0.0119**	0.014	35.81	0.0322	0.0353	0.0469	6,214	0.739
Xylenes***	1330-20-7	C8H10	106.165	**1.7000**	1.804	4,754.25	4.2728	4.6846	6.2240	5,209	88.547
			Totals:	**100.04**	**42.23**	**111,269**	**100.00**	**---**	**---**	**Calculated Btu/scf (HHV):**	**2,165**
			THC:	**84.79**	**38.51**	**101,486**	**91.21**	**100.00**	**---**		
			Total VOC:	**46.29**	**28.99**	**76,385**	**68.65**	**75.27**	**100.00**		
			Total HAP:	**5.25**	**4.84**	**12,763**	**11.47**	**12.58**	**16.71**		

#UGC (Universal Gas Constant)
= 379.482 scf/lb-mol @ 60 oF and 14.6959 psia.

lb "X"/scf =
(M% of "X") x (MW of "X") / #UGC

100% Recycle as fuel in Dehydrator Reboilers

Component	Representative GRI-GLYCalc Results			Assumed "Worst-Case" Min Margin: 15%		Margin for Changes in Future Condenser Vent Composition
	Mole %	Wgt %	lb/MMscf	Wgt %	lb/MMscf	
CO2	3.70	3.86	4,289.44	4.42	4,950.00	**15% Margin**
Methane*	14.60	5.55	6,170	6.34	7,100	**15% Margin**
Other (N2, C2, O2, CO, H2O)	23.90	17.01	18,931	10.80	12,100	**--- Margin**
VOC**	46.29	68.65	76,385	78.44	87,850	**15% Margin**
Total Conesner Vent	**100.04**	**100.00**	**111,269**	**100.00**	**112,000**	
Benzene***	1.20E+00	2.22E+00	2.47E+03	2.54	2,850.00	**15% Margin**
Ethylbenzene***	0.0629	0.1581	175.91	0.20	225.00	**28% Margin**
n-Hexane***	1.2900	2.6318	2,928.36	3.01	3,375.00	**15% Margin**
Methanol (MeOH)***	2E-03	2E-03	1.69E+00	0.02	25.00	**1381% Margin**
Toluene***	9.88E-01	2.16E+00	2,398.00	2.48	2,775.00	**16% Margin**
2,2,4-Trimethylpentane***	0.0119	0.0322	35.81	0.04	50.00	**40% Margin**
Xylenes***	1.70E+00	4.27E+00	4,754.25	4.89	5,475.00	**15% Margin**
Total HAP***	**5.25**	**11.47**	**12,763**	**13.19**	**14,775**	**16% Margin**

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

Condenser Vent – GRI-GLYCalc Results

0010a-S3c-AMS-Miller CS-45CSR13 Mod-55 MMscf-GLYCalc-Electric-...

CONDENSER VENT STREAM

Temperature: 120.00 deg. F
Pressure: 14.80 psia
Flow Rate: 2.47e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.15e+001	1.35e+000
Carbon Dioxide	3.70e+000	1.06e+000
Nitrogen	4.81e-002	8.76e-003
Methane	1.46e+001	1.52e+000
Ethane	2.39e+001	4.67e+000
Propane	1.68e+001	4.82e+000
Isobutane	3.88e+000	1.47e+000
n-Butane	9.41e+000	3.56e+000
Isopentane	2.48e+000	1.16e+000
n-Pentane	2.85e+000	1.34e+000
n-Hexane	1.29e+000	7.25e-001
Cyclohexane	6.57e-001	3.60e-001
Other Hexanes	2.33e+000	1.30e+000
Heptanes	1.60e+000	1.04e+000
Methylcyclohexane	1.02e+000	6.53e-001
2,2,4-Trimethylpentane	1.19e-002	8.81e-003
Benzene	1.20e+000	6.08e-001
Toluene	9.88e-001	5.92e-001
Ethylbenzene	6.29e-002	4.34e-002
Xylenes	1.70e+000	1.18e+000
C8+ Heavies	6.21e-003	6.88e-003
Total Components	100.00	2.75e+001

100% Recycle as fuel in Dehydrator Reboilers

Supplement S5
Vendor Data

- **1,900 bhp Waukesha L7044 GSI Compressor Engine (4SRB) w/ NSCR**
- **1,380 bhp CAT G3516B Compressor Engine (4SLB) w/ OxCat**
- **805 bhp Capstone C600 Microturbine Generator**
- **BTEX Buster**
- **Vapor Recovery Unit (VRU)**
- **Activated Carbon Canisters (CarbCan)**

Williams - Miller 7044GSI S5 - WV

VHP - L7044GSI S5

Waukesha S. Cunliffe 414-491-0110 shane.cunliffe@innio.com

Gas Compression

ENGINE SPEED (rpm):	1200	NOx SELECTION (g/bhp-hr):	Customer Catalyst
DISPLACEMENT (in3):	7040	COOLING SYSTEM:	JW, IC + OC
COMPRESSION RATIO:	9.7:1	INTERCOOLER WATER INLET (°F):	130
IGNITION SYSTEM:	ESM2	JACKET WATER OUTLET (°F):	180
EXHAUST MANIFOLD:	Water Cooled	JACKET WATER CAPACITY (gal):	100
COMBUSTION:	Rich Burn, Turbocharged	AUXILIARY WATER CAPACITY (gal):	11
ENGINE DRY WEIGHT (lbs):	24250	LUBE OIL CAPACITY (gal):	190
AIR/FUEL RATIO SETTING:	0.38% CO	MAX. EXHAUST BACKPRESSURE (in. H2O):	20
ENGINE SOUND LEVEL (dBA)	105	MAX. AIR INLET RESTRICTION (in. H2O):	15
IGNITION TIMING:	ESM2 Controlled	EXHAUST SOUND LEVEL (dBA)	113

SITE CONDITIONS:

FUEL:	Natural Gas	ALTITUDE (ft):	1000
FUEL PRESSURE RANGE (psig):	40 - 60	MAXIMUM INLET AIR TEMPERATURE (°F):	100
FUEL HHV (BTU/ft3):	1,203.5	FUEL WKI:	67.3
FUEL LHV (BTU/ft3):	1,087.9		

SITE SPECIFIC TECHNICAL DATA

POWER RATING	UNITS		MAX RATING AT 100 °F AIR TEMP	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE OF 100 °F		
				100%	85%	50%
CONTINUOUS ENGINE POWER	BHP		1900	1900	1615	950
OVERLOAD	% 2/24 hr		0	0	-	-
MECHANICAL EFFICIENCY (LHV)	%		34.5	34.5	34.1	31.9
CONTINUOUS POWER AT FLYWHEEL	BHP		1900	1900	1615	950
based on no auxiliary engine driven equipment						
AVAILABLE TURNDOWN SPEED RANGE	RPM		900 - 1200			
FUEL CONSUMPTION						
FUEL CONSUMPTION (LHV)	BTU/BHP-hr		7391	7391	7459	7975
FUEL CONSUMPTION (HHV)	BTU/BHP-hr		8176	8176	8251	8822
FUEL FLOW *based on fuel analysis LHV*	SCFM		215	215	185	116
HEAT REJECTION						
JACKET WATER (JW)	BTU/hr x 1000		3848	3848	3376	2267
LUBE OIL (OC)	BTU/hr x 1000		487	487	468	404
INTERCOOLER (IC)	BTU/hr x 1000		704	704	507	145
EXHAUST	BTU/hr x 1000		3837	3837	3234	1953
RADIATION	BTU/hr x 1000		605	605	584	539
EMISSIONS (ENGINE OUT):						
NOx (NO + NO2)	g/bhp-hr		11.54	11.54	12.45	13.39
CO	g/bhp-hr		9.63	9.63	9.55	9.82
THC	g/bhp-hr		0.35	0.35	0.45	0.74
NMHC	g/bhp-hr		0.114	0.114	0.147	0.241
NM,NEHC (VOC)	g/bhp-hr		0.049	0.049	0.063	0.103
CO2	g/bhp-hr		465	465	470	502
CO2e (Methane GWP: 25)	g/bhp-hr		471	471	477	514
CH2O	g/bhp-hr		0.050	0.050	0.050	0.050
CH4	g/bhp-hr		0.24	0.24	0.31	0.50
AIR INTAKE / EXHAUST GAS						
INDUCTION AIR FLOW	SCFM		2628	2628	2254	1419
EXHAUST GAS MASS FLOW	lb/hr		12219	12219	10480	6595
EXHAUST GAS FLOW *at exhaust temp, 14.5 psia*	ACFM		8667	8667	7345	4490
EXHAUST TEMPERATURE	°F		1136	1136	1117	1072

HEAT EXCHANGER SIZING[12]			
TOTAL JACKET WATER CIRCUIT (JW)	BTU/hr x 1000		4363
TOTAL AUXILIARY WATER CIRCUIT (IC + OC)	BTU/hr x 1000		1350

COOLING SYSTEM WITH ENGINE MOUNTED WATER PUMPS		
JACKET WATER PUMP MIN. DESIGN FLOW	GPM	450
JACKET WATER PUMP MAX. EXTERNAL RESTRICTION	psig	16
AUX WATER PUMP MIN. DESIGN FLOW	GPM	79
AUX WATER PUMP MAX. EXTERNAL RESTRICTION	psig	36

All data provided per the condtions listed in the notes section on page three.

Data Generated by EngCalc Program Version 4.2 INNIO Waukesha Gas Engines, Inc.

8/11/2022 4:14 PM

FUEL COMPOSITION

HYDROCARBONS:		Mole or Volume %
Methane	CH4	82.179
Ethane	C2H6	12.106
Propane	C3H8	3.3077
Iso-Butane	I-C4H10	0.4618
Normal Butane	N-C4H10	0.7731
Iso-Pentane	I-C5H12	0.2075
Normal Pentane	N-C5H12	0.1728
Hexane	C6H14	0.3045
Heptane	C7H16	0
Ethene	C2H4	0
Propene	C3H6	0
	SUM HYDROCARBONS	99.512
NON-HYDROCARBONS:		
Nitrogen	N2	0.3054
Oxygen	O2	0
Helium	He	0
Carbon Dioxide	CO2	0.1823
Carbon Monoxide	CO	0
Hydrogen	H2	0
Water Vapor	H2O	0
	TOTAL FUEL	100

FUEL:	Natural Gas
FUEL PRESSURE RANGE (psig):	40 - 60
FUEL WKI:	67.3
FUEL SLHV (BTU/ft3):	1068.99
FUEL SLHV (MJ/Nm3):	42.04
FUEL LHV (BTU/ft3):	1087.92
FUEL LHV (MJ/Nm3):	42.78
FUEL HHV (BTU/ft3):	1203.45
FUEL HHV (MJ/Nm3):	47.32
FUEL DENSITY (SG):	0.68

Standard Conditions per ASTM D3588-91 [60°F and 14.696psia] and ISO 6976:1996-02-01[25, V(0;101.325)].
Based on the fuel composition, supply pressure and temperature, liquid hydrocarbons may be present in the fuel. No liquid hydrocarbons are allowed in the fuel. The fuel must not contain any liquid water.
Waukesha recommends both of the following:
1) Dew point of the fuel gas to be at least 20°F (11°C) below the measured temperature of the gas at the inlet of the engine fuel regulator.
2) A fuel filter separator to be used on all fuels except commercial quality natural gas.
Refer to the 'Fuel and Lubrication' section of 'Technical Data' or contact the Waukesha Application Engineering Department for additional information on fuels, or LHV and WKI* calculations.
* Trademark of INNIO Waukesha Gas Engines Inc.

FUEL CONTAMINANTS

Total Sulfur Compounds	0	% volume
Total Halogen as Chloride	0	% volume
Total Ammonia	0	% volume
Siloxanes		
Tetramethyl silane	0	% volume
Trimethyl silanol	0	% volume
Hexamethyldisiloxane (L2)	0	% volume
Hexamethylcyclotrisiloxane (D3)	0	% volume
Octamethyltrisiloxane (L3)	0	% volume
Octamethylcyclotetrasiloxane (D4)	0	% volume
Decamethyltetrasiloxane (L4)	0	% volume
Decamethylcyclopentasiloxane (D5)	0	% volume
Dodecamethylpentasiloxane (L5)	0	% volume
Dodecamethylcyclohexasiloxane (D6)	0	% volume
Others	0	% volume

Total Sulfur Compounds	0 µg/BTU
Total Halogen as Chloric	0 µg/BTU
Total Ammonia	0 µg/BTU
Total Siloxanes (as Si)	0 µg/BTU

Calculated fuel contaminant analysis will depend on the entered fuel composition and selected engine model.

No water or hydrocarbon condensates are allowed in the engine. Requires liquids removal.

NOTES

1. All data is based on engines with standard configurations unless noted otherwise.
2. Power rating is adjusted for fuel, site altitude, and site air inlet temperature, in accordance with ISO 3046/1 with tolerance of ± 3%.
3. Fuel consumption is presented in accordance with ISO 3046/1 with a tolerance of -0 / +5% at maximum rating. Fuel flow calculation based on fuel LHV and fuel consumption with a tolerance of -0/+5 %. For sizing piping and fuel equipment, it is recommended to include the 5% tolerance.
4. Heat rejection tolerances are ± 30% for radiation, and ± 8% for jacket water, lube oil, intercooler, and exhaust energy.
5. Emission levels for engines with Waukesha supplied 3-way catalyst are given at catalyst outlet flange. For all other engine models, emission levels are given at engine exhaust outlet flange prior to any after treatment. Values are based on a new engine operating at indicated site conditions, and adjusted to the specified timing and air/fuel ratio at rated load. Catalyst out emission levels represent emission levels the catalyst is sized to achieve. Manual adjustment may be necessary to achieve compliance as catalyst/engine age. Catalyst-out emission levels are valid for the duration of the engine warranty. Emissions are at an absolute humidity of 75 grains H2O/lb (10.71 g H2O/kg) of dry air. Emission levels may vary subject to instrumentation, measurement, ambient conditions, fuel quality, and engine variation. Engine may require adjustment on-site to meet emission values, which may affect engine performance and heat output. NOx, CO, THC, and NMHC emission levels are listed as a not to exceed limit, all other emission levels are estimated. CO2 emissions based on EPA Federal Register/Vol. 74, No. 209/Friday, October 30, 2009 Rules and Regulations 56398, 56399 (3) Tier 3 Calculation Methodology, Equation C-5.
6. Air flow is based on undried air with a tolerance of ± 7%.
7. Exhaust temperature given at engine exhaust outlet flange with a tolerance of ± 50°F (28°C).
8. Exhaust gas mass flow value is based on a "wet basis" with a tolerance of ± 7%.
9. Inlet air restrictions based on full rated engine load. Exhaust backpressure based on 178.1 PSI BMEP and 1200 RPM. Refer to the engine specification section of Waukesha's standard technical data for more information.
10. Cooling circuit capacity, lube oil capacity, and engine dry weight values are typical.
11. Fuel must conform to Waukesha's "Gaseous Fuel Specification" S7884-7 or most current version. Fuel may require treatment to meet current fuel specification.
12. Heat exchanger sizing values given as the maximum heat rejection of the circuit, with applied tolerances and an additional 5% reserve factor.
13. Fuel volume flow calculation in english units is based on 100% relative humidity of the fuel gas at standard conditions of 60°F and 14.696 psia (29.92 inches of mercury; 101.325 kPa).
14. Fuel volume flow calculation in metric units is based on 100% relative humidity of the fuel gas at a combustion temperature of 25°C and metering conditions of 0°C and 101.325 kPa (14.696 psia; 29.92 inches of mercury). This is expressed as [25, V(0;101.325)].
15. Engine sound data taken with the microphone at 1 m (3.3 ft) from the side of the engine at the approximate front-to-back centerline. Microphone height was at intake manifold level. Engine sound pressure data may be different at front, back and opposite side locations. Exhaust sound data taken with microphone 1 meter (3.3 ft) away and 1 meter (3.3 ft) to the side of the exhaust outlet.
16. Due to variation between test conditions and final site conditions, such as exhaust configuration and background sound level, sound pressure levels under site conditions may be different than those tabulated above.
17. Cooling system design flow is based on minimum allowable cooling system flow. Cooling system maximum external restriction is defined as the allowable restriction at the minimum cooling system flow.
18. Continuous Power Rating: The highest load and speed that can be applied 24 hours per day, seven days per week, 365 days per year except for normal maintenance at indicated ambient reference conditions and fuel. No engine overload power rating is available.
19. emPact emission compliance available for entire range of operable fuels; however, fuel system and/or O2 set point may need to be adjusted in order to maintain compliance.
20. In cold ambient temperatures, heating of the engine jacket water, lube oil and combustion air may be required. See Waukesha Technical Data.
21. Available Turndown Speed Range refers to the constant torque speed range available. Reduced power may be available at speeds outside of this range. Contact application engineering.

SPECIAL REQUIREMENTS

Application & Performance Warranty Data

Project Information

Site Location:	US
Project Name:	Williams Miller station silencer catalyst combo
Application:	Air Compression
Number Of Engines:	2
Operating Hours per Year:	8760

Engine Specifications

Engine Manufacturer:	Waukesha
Model Number:	L7044GSI S5
Rated Speed:	1200 RPM
Type of Fuel:	Natural Gas
Type of Lube Oil:	0 sulfated ash or less
Number of Exhaust Manifolds:	1

Engine Cycle Data

Load	Speed	Power	Exhaust Flow	Exhaust Temp.	Fuel Cons.	NO_x	CO	NMNEHC	CH_2O	O_2	H_2O
%		*bhp*	*acfm (cfm)*	*° F*		*g/bhp-hr*	*g/bhp-hr*	*g/bhp-hr*	*g/bhp-hr*	*%*	*%*
100	Rated	1,900	8,667	1,136		11.54	9.63	0.049	0.05	0.3	15

Emission Data (100% Load)

Emission	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	g/bhp-hr	*tons/yr*	*ppmvd @ 15% O_2*	*ppmvd*	*g/kW-hr*	*lb/MW-hr*	*g/bhp-hr*	*tons/yr*	*ppmvd @ 15% O_2*	*ppmvd*	*g/kW-hr*	*lb/MW-hr*	
NO_x	11.54	211.72	793	2,768	15.475	34.12	0.3	5.5	21	72	0.402	0.89	97.4%
CO	9.63	176.68	1,086	3,793	12.914	28.47	0.59	10.82	67	232	0.791	1.74	93.9%
NMNEHC	0.05	0.9	10	34	0.066	0.14	0.02	0.45	5	17	0.033	0.07	50%
CH_2O	0.05	0.92	5	18	0.067	0.15	0.01	0.22	1	4	0.016	0.04	76.1%

System Specifications

Catalyst System Specifications (RHS2-4836-18)

Housing Model Number:	RHS2-4836-18-HSG-0
Element Model Number:	MECB-TW-RB3795-3477-0000-291
Number of Catalyst Layers:	2
Number of Spare Catalyst Layers:	0
Sound Attenuation:	30-35 dBA insertion loss
Design Exhaust Flow Rate:	8,667 acfm (cfm)
Design Exhaust Temperature[1]:	1,136° F
Exhaust Temperature Limits*:	750° F – 1250° F (catalyst inlet); 1350° F (catalyst outlet)
System Pressure Loss:	6.0 inH_2O (Clean)

* General catalyst temperature operating range. Performance is based on the Design Exhaust Temperature.

MIRATECH Scope of Supply & Equipment Details

	Model Number	Quantity
Catalyst Housing & Catalyst	**RHS2-4836-18**	**1 / engine**
Catalyst Housing	RHS2-4836-18-HSG-0	1 / engine
• Material	Carbon Steel	
• Paint	Standard High Temperature Black Paint	
• Inlet Location	End	
• Outlet Location	End	
• Instrumentation Ports	1 inlet/1 outlet/2 catalyst (1/2" NPT)	
• Oxygen Sensor Ports	1 inlet/1 outlet (18mm)	
• Approximate Diameter	34 in Catalyst Shell / 48 in Silencer Shell	
• Inlet Pipe Size & Connection	18 in FF Flange, 150# ANSI standard bolt pattern	
• Outlet Pipe Size & Connection	18 in FF Flange, 150# ANSI standard bolt pattern	
• Overall Length	172 in	
• Weight Without Catalyst	2,036 lbs	
Three-Way Catalyst	MECB-TW-RB3795-3477-0000-291	2 / engine
Nut, Bolt, and Gasket Set	NBG-IQ36-2	1 / engine

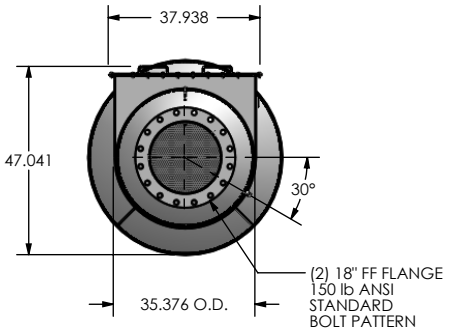
Customer Scope Of Supply

- Support Structure
- Attachment to Support Structure (Bolts, Nuts, Levels, etc.)
- Expansion Joints
- Exhaust Piping
- Inlet Pipe Bolts, Nuts, & Gasket
- Outlet Pipe Bolts, Nuts, & Gasket

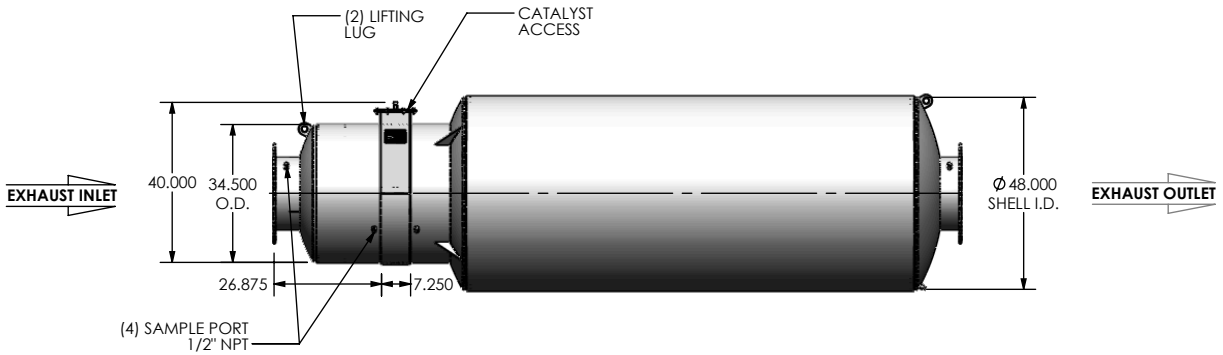
Special Notes & Conditions

1. For housings and exhaust components that are insulated, internally or externally, please refer to Section 7.1 of the General Terms and Conditions of Sale to prevent voiding MIRATECH product warranty. - Carbon steel is suitable for temperatures up to 900° F / 482° C continuously, when covered with external insulation or a heat shield. For continuous operation above 900° F / 482° C, where the equipment is externally insulated or has a heat shield, stainless steel should be used.

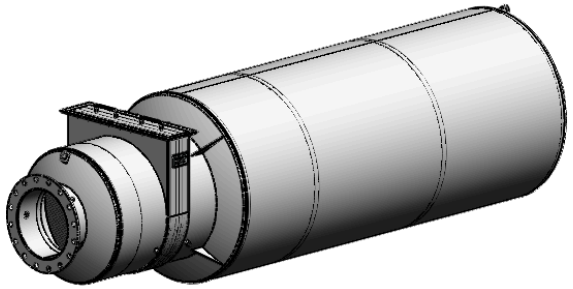
- A packed silencer installed upstream of the MIRATECH catalyst system will void MIRATECH's limited warranty.
- Final catalyst housings are dependent on engine output and required emission reductions. Changes may be made to optimize the system design at the time of order.
- Any drawings included with this proposal are preliminary in nature and could change depending on final product selection.
- Any sound attenuation listed in this proposal is based on housing with catalyst elements installed.
- Any emission reductions listed in this proposal are based on housing with catalyst elements installed.
- MIRATECH will confirm shipping location upon placement of order.

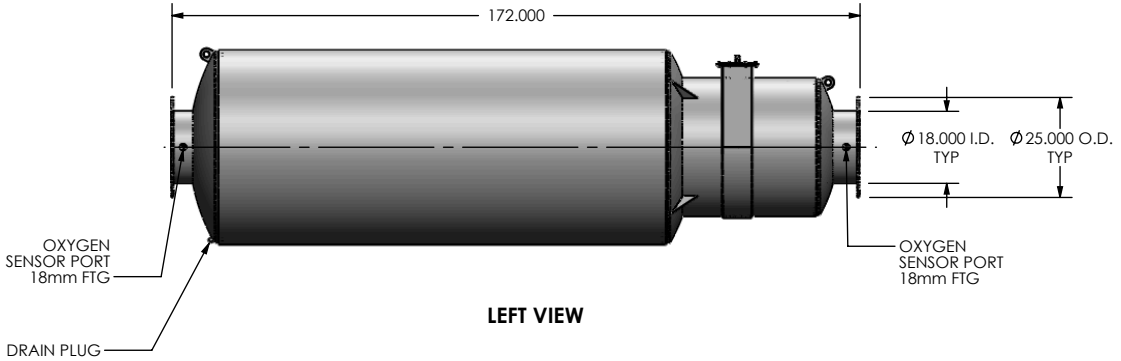


FRONT VIEW



RIGHT VIEW





LEFT VIEW

MATERIAL CONSTRUCTION:

- CARBON STEEL

PROJECT NAME	
PROPOSAL NUMBER	
SALES ORDER NO.	
CUSTOMER P.O.	

DIMENSIONS ARE APPROXIMATE IN INCHES UNLESS OTHERWISE SPECIFIED

DO NOT SCALE DRAWING

MIRATECH

RHS2-4836-18
Sales Drawing

DRAWN	CDT	DATE	12/22/2011	DRAWING	RHS2-4836-18 SD	REV 0
REVIEWED BY	AJM	DATE	12/27/2011	SIZE A	SCALE 1:16	WEIGHT: 2165 lb	SHEET 1 OF 1

G3516B

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
Miller CF 1/13/15

CATERPILLAR®

ENGINE SPEED (rpm):	1400	RATING STRATEGY:	STANDARD
COMPRESSION RATIO:	8:1	RATING LEVEL:	CONTINUOUS
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	CAT WIDE RANGE WITH AIR FUEL RATIO CONTROL
AFTERCOOLER - STAGE 2 INLET (°F):	130		
AFTERCOOLER - STAGE 1 INLET (°F):	201	**SITE CONDITIONS:**	
JACKET WATER OUTLET (°F):	210	FUEL:	Miller CF
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig):	7.0-40.0
COOLING SYSTEM:	JW+OC+1AC, 2AC	FUEL METHANE NUMBER:	68.7
CONTROL SYSTEM:	ADEM3	FUEL LHV (Btu/scf):	1026
EXHAUST MANIFOLD:	DRY	ALTITUDE(ft):	500
COMBUSTION:	LOW EMISSION	MAXIMUM INLET AIR TEMPERATURE(°F):	77
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	STANDARD RATED POWER:	1380 bhp@1400rpm
SET POINT TIMING:	30		

				MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING		**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(WITHOUT FAN)	(1)	bhp	1380	1380	1035	690
INLET AIR TEMPERATURE			°F	77	77	77	77
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(2)	Btu/bhp-hr	7437	7437	7966	8556
FUEL CONSUMPTION (HHV)		(2)	Btu/bhp-hr	8226	8226	8810	9463
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(3)(4)	ft3/min	3144	3144	2467	1724
AIR FLOW	(WET)	(3)(4)	lb/hr	13943	13943	10937	7646
FUEL FLOW (60°F, 14.7 psia)			scfm	167	167	134	96
INLET MANIFOLD PRESSURE		(5)	in Hg(abs)	94.0	94.0	76.3	53.6
EXHAUST TEMPERATURE - ENGINE OUTLET		(6)	°F	995	995	989	1009
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(7)(4)	ft3/min	9156	9156	7161	5081
EXHAUST GAS MASS FLOW	(WET)	(7)(4)	lb/hr	14428	14428	11327	7925
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(8)(9)	g/bhp-hr	0.50	0.50	0.50	0.50
CO		(8)(9)	g/bhp-hr	2.71	2.71	2.91	2.85
THC (mol. wt. of 15.84)		(8)(9)	g/bhp-hr	4.79	4.79	5.13	5.21
NMHC (mol. wt. of 15.84)		(8)(9)	g/bhp-hr	1.21	1.21	1.29	1.31
NMNEHC (VOCs) (mol. wt. of 15.84)		(8)(9)(10)	g/bhp-hr	0.48	0.48	0.51	0.52
HCHO (Formaldehyde)		(8)(9)	g/bhp-hr	0.43	0.43	0.42	0.42
CO2		(8)(9)	g/bhp-hr	484	484	517	562
EXHAUST OXYGEN		(8)(11)	% DRY	9.1	9.1	8.8	8.3
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(12)	Btu/min	23016	23016	21256	19733
HEAT REJ. TO ATMOSPHERE		(12)	Btu/min	6110	6110	5092	4074
HEAT REJ. TO LUBE OIL (OC)		(12)	Btu/min	4475	4475	3978	3363
HEAT REJ. TO A/C - STAGE 1 (1AC)		(12)(13)	Btu/min	9927	9927	8186	2728
HEAT REJ. TO A/C - STAGE 2 (2AC)		(12)(13)	Btu/min	5359	5359	5060	3333

COOLING SYSTEM SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW+OC+1AC)	(13)(14)	Btu/min	41110
TOTAL AFTERCOOLER CIRCUIT (2AC)	(13)(14)	Btu/min	5627
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.			

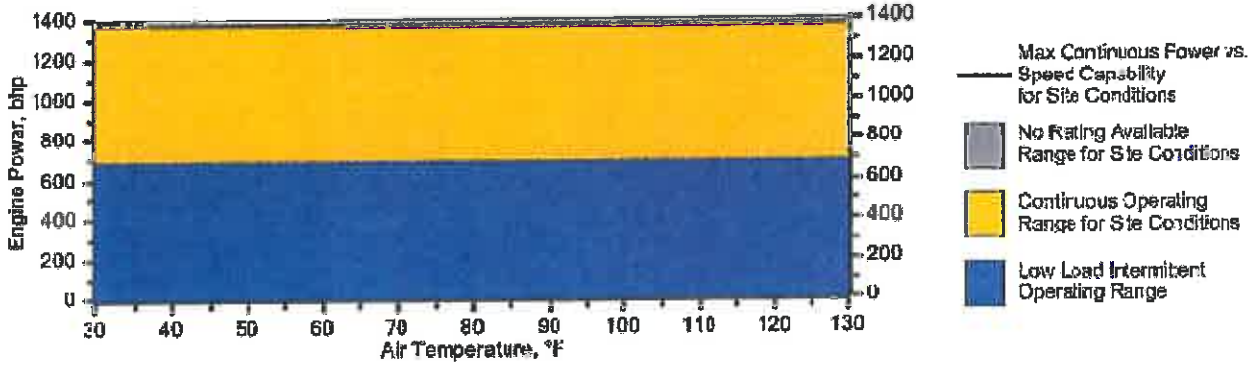
CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

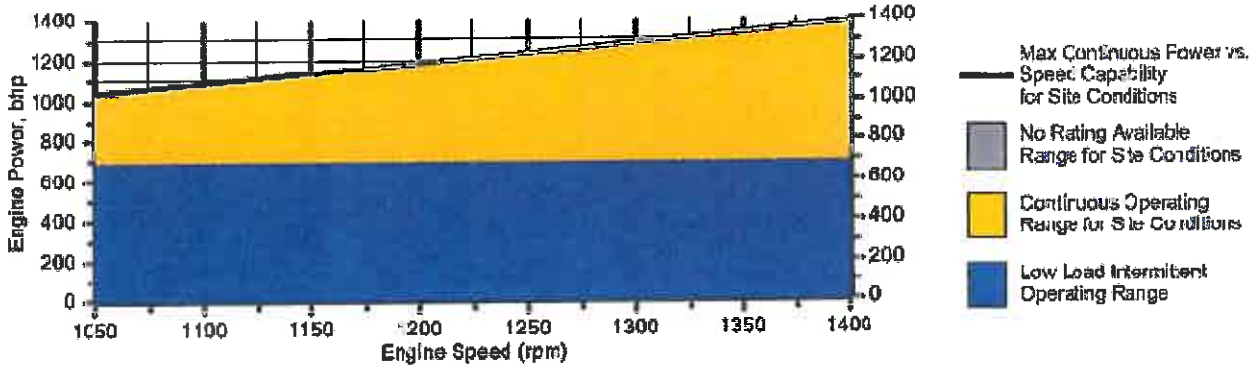
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 500 ft and 1400 rpm



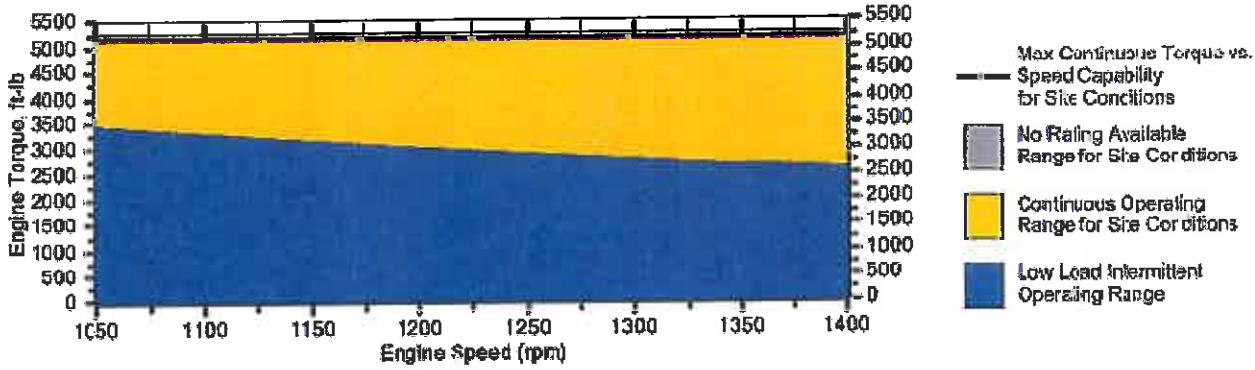
Engine Power vs. Engine Speed

Data represents speed sweep at 500 ft and 77 °F



Engine Torque vs. Engine Speed

Data represents speed sweep at 500 ft and 77 °F



Note: At site conditions of 500 ft and 77°F inlet air temp., constant torque can be maintained down to 1050 rpm. The minimum speed for loading at these conditions is 1050 rpm.

NOTES

1. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.

2. Fuel consumption tolerance is ± 3.0% of full load data.

3. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

4. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

5. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

6. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

7. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of ± 6 %.

8. Emissions data is at engine exhaust flange prior to any after treatment.

9. Emission values are based on engine operating at steady state conditions. Fuel methane number cannot vary more than ± 3. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate "Not to Exceed" values. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.

10. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ

11. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.

12. Heat rejection values are nominal. Tolerances, based on treated water, are ± 10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit, and ± 5% for aftercooler circuit.

13. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.

14. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	86.9600	86.9600
Ethane	C2H6	9.6960	9.6960
Propane	C3H8	1.9890	1.9890
Isobutane	iso-C4H1O	0.2480	0.2480
Norbutane	nor-C4H1O	0.3680	0.3680
Isopentane	iso-C5H12	0.0940	0.0940
Norpentane	nor-C5H12	0.0680	0.0680
Hexane	C6H14	0.1050	0.1050
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	0.2960	0.2960
Carbon Dioxide	CO2	0.1760	0.1760
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0000	100.0000

Fuel Makeup:	Miller CF
Unit of Measure:	English
Calculated Fuel Properties	
Caterpillar Methane Number:	68.7
Lower Heating Value (Btu/scf):	1026
Higher Heating Value (Btu/scf):	1135
WOBBE Index (Btu/scf):	1285
THC: Free Inert Ratio:	210.86
Total % Inerts (% N2, CO2, He):	0.47%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.997
Stoich A/F Ratio (Vol/Vol):	10.68
Stoich A/F Ratio (Mass/Mass):	16.74
Specific Gravity (Relative to Air):	0.638
Specific Heat Constant (K):	1.297

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

10497 Town & Country Way, Ste. 940
Houston, TX 77024
Office: 307.673.0883 | Direct: 307.675.5045
ohartz@emittechnologies.com

Prepared For:
Kijun Hong
WILLIAMS FIELD SERVICES

QUOTE: QUO-14653-L9T6

INFORMATION PROVIDED BY CATERPILLAR

Engine:	G3516B
Horsepower:	1380
RPM:	1400
Compression Ratio:	8.0
Exhaust Flow Rate:	9156 CFM
Exhaust Temperature:	995 °F
Reference:	DM8800-07
Fuel:	Natural Gas
Annual Operating Hours:	8760

Uncontrolled Emissions

	g/bhp-hr	Lb/Hr	Tons/Year
NOx:	0.50	1.52	6.66
CO:	2.71	8.24	36.11
THC:	4.79	14.57	63.83
NMHC	1.21	3.68	16.12
NMNEHC:	0.48	1.46	6.40
HCHO:	0.43	1.31	5.73
O2:	9.10 %		

POST CATALYST EMISSIONS

	g/bhp-hr
NOx:	Unaffected by Oxidation Catalyst
CO:	<0.50
VOC:	<0.26

CONTROL EQUIPMENT

Catalyst Housing

Model:	ELH-4200-1616F-4CEE-242
Manufacturer:	EMIT Technologies, Inc
Element Size:	Rectangle 24" x 15" x 3.5"
Housing Type:	4 Element Capacity
Catalyst Installation:	Accessible Housing
Construction:	10 gauge Carbon Steel
Sample Ports:	9 (0.5" NPT)
Inlet Connections:	16" Flat Face Flange
Outlet Connections:	16" Flat Face Flange
Configuration:	End In / End Out
Silencer:	Integrated
Silencer Grade:	Hospital
Insertion Loss:	35-40 dBA

Catalyst Element

Model:	RT-2415-H
Catalyst Type:	Oxidation, Premium Precious Group Metals
Substrate Type:	BRAZED
Manufacturer:	EMIT Technologies, Inc
Element Quantity:	2
Element Size:	Rectangle 24" x 15" x 3.5"

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Houston, TX 77024
Office: 307.673.0883 | Direct: 307.675.5045
ohartz@emittechnologies.com

WARRANTY

EMIT Technologies, Inc. warrants that the goods supplied will be free from defects in workmanship by EMIT Technologies, Inc. for a period of two (2) years from date of shipment. EMIT Technologies, Inc. will not be responsible for any defects which result from improper use, neglect, failure to properly maintain or which are attributable to defects, errors or omissions in any drawings, specifications, plans or descriptions, whether written or oral, supplied to EMIT Technologies, Inc. by Buyer.

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

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

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

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

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

Engine lubrication oil shall contain less than 0.5 wt% Sulfated Ash with a maximum allowable specific oil consumption of 0.7 g/bhp-hr. The catalyst shall be limited to a maximum ash loading of 0.022 lb/ft3. Phosphorous and zinc additives are limited to 0.03 wt%. New or Reconstructed engines must operate for a minimum of 50 hours prior to catalyst installation, otherwise the warranty is void.

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

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

Terms: Credit is extended to purchaser for net 30 time period. If payment is not received in the net 30 timeframe, interest on the unpaid balance will accrue at a rate of 1.5% per month from the invoice date.

Order Cancellation Terms: Upon cancellation of an order once submittal of a Purchase Order has occurred, the customer will pay a 25% restocking fee for Catalyst Housings, Catalyst Elements, and Air/Fuel Ratio Controllers; 50% restocking fee for Cooler Top Solutions Exhaust System Accessories, and other Custom Built Products; 100% of all associated shipping costs incurred by EMIT; 100% of all project expenses incurred by EMIT for Field Services.

Capstone Green Energy

Energy Conversion Products

C600S Power Package

High-pressure Natural Gas

The Signature Series Microturbine provides 600kW of reliable electrical power in one small, ultra-low emission, and highly efficient package.

C600S Power Package

Electrical Performance[1]

Electrical Power Output	600kW
Voltage	400/480 VAC
Electrical Service	3-Phase, 4 Wire Wye
Frequency	50/60 Hz
Electrical Efficiency LHV	33%

Fuel/Engine Characteristics[1]

Natural Gas HHV	30.7–47.5 MJ/m^3 (825–1,275 BTU/scf)
Inlet Pressure	517–551 kPa gauge (75–80 psig)
Fuel Flow HHV	7,200 MJ/hr (6,840,000 BTU/hr)
Net Heat Rate LHV	10.9 MJ/kWh (10,300 BTU/kWh)

Exhaust Characteristics[1]

NOx Emissions @ 15% O_2	< 9 ppmvd (18 mg/m^3)
Exhaust Mass Flow	4.0 kg/s (8.8 lbm/s)
Exhaust Gas Temperature	280°C (535°F)

Benefits

- Ultra-low emissions
- One moving part – minimal maintenance and downtime
- Patented air bearings – no lubricating oil or coolant
- Integrated utility synchronization – no external switchgear
- Compact modular design allows for easy, low-cost installation
- High electrical efficiency over a very wide operating range
- High availability – part load redundancy
- Remote monitoring and diagnostic capabilities
- Proven technology with tens of millions of operating hours
- Various Factory Protection Plans available

Smarter Energy for a Cleaner Future

Dimensions & Weight[2]

Width x Depth x Height	3.0 x 5.8 x 3.0 m (117 x 230 x 119 in)
Weight - Grid Connect Model	11,250 kg (24,800 lbs)
Weight - Dual Mode Model	13,350 kg (29,400 lbs)

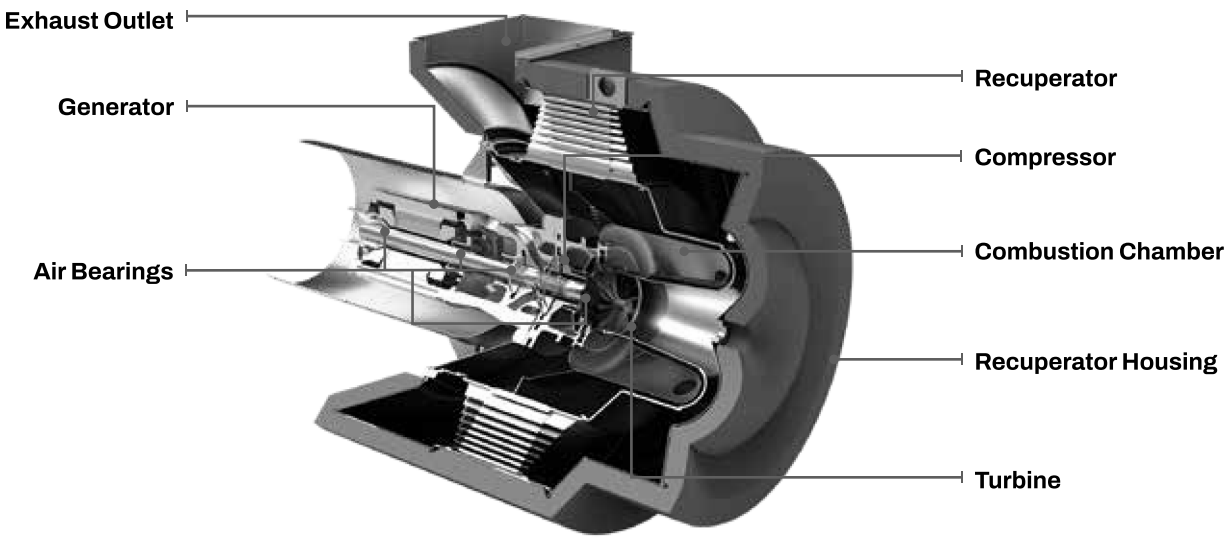
Minimum Clearance Requirements[3]

Horizontal Clearance	
Left	1.5 m (60 in)
Right	0.0 m (0 in)
Front	1.7 m (65 in)
Rear	2.2 m (85 in)

Certifications

- **UL 2200 Listed**
- **CE Certified**
- **Certified to the following grid interconnections standards: UL 1741-SA, VDE, BDEW, CEI 0-16, AS4777**
- **Compliant to California Rule 21**

C200 Engine Components



(1) Nominal full power performance at ISO conditions: 15˚C (59˚F), 14.696 psia, 60% RH
(2) Approximate dimensions and weights
(3) Clearance requirements may increase due to local code considerations
Specifications are not warranted and are subject to change without notice.

Call us (toll free) 1.866.422.7786 | Tel: 1.818.734.5300 | www.capstonegreenenergy.com

Capstone Green Energy

Capstone Turbine Corporation • 21211 Nordhoff Street • Chatsworth • CA 91311 • USA
Phone: (818) 734-5300 • Fax: (818) 734-5320 • Web: www.microturbine.com

The C600 Unit is comprised of 3 C200 Units

Technical Reference

Capstone MicroTurbine™ Systems Emissions

Summary

Capstone MicroTurbine™ systems are inherently clean and can meet some of the strictest emissions standards in the world. This technical reference is to provide customers with information that may be requested by local air permitting organizations or to compare air quality impacts of different technologies for a specific project. The preferred units of measure are "output based"; meaning that the quantity of a particular exhaust emission is reported relative to the useable output of the microturbine – typically in pounds per megawatt hour for electrical generating equipment. This technical reference also provides volumetric measurements in parts per million and milligrams per normal cubic meter. A conversion between several common units is also provided.

Maximum Exhaust Emissions at ISO Conditions

Table 1 below summarizes the exhaust emissions at full power and ISO conditions for different Capstone microturbine models. Note that the fuel can have a significant impact on certain emissions. For example landfill and digester gas can be made up of a wide variety of fuel elements and impurities, and typically contains some percentage of carbon dioxide (CO_2). This CO_2 dilutes the fuel, makes complete combustion more difficult, and results in higher carbon monoxide emissions (CO) than for pipeline-quality natural gas.

Table 1. Emission for Different Capstone Microturbine Models in [lb/MWhe]

Model	Fuel	NOx	CO	VOC (5)
C30 NG	Natural Gas (1)	0.64	1.8	0.23
CR30 MBTU	Landfill Gas (2)	0.64	22.0	1.00
CR30 MBTU	Digester Gas (3)	0.64	11.0	1.00
C30 Liquid	Diesel #2 (4)	2.60	0.41	0.23
C65 NG Standard	Natural Gas (1)	0.46	1.25	0.10
C65 NG Low NOx	Natural Gas (1)	0.17	1.30	0.10
C65 NG CARB	Natural Gas (1)	0.17	0.24	0.05
CR65 Landfill	Landfill Gas (2)	0.46	4.0	0.10
CR65 Digester	Digester Gas (3)	0.46	4.0	0.10
C200 NG	Natural Gas (1)	0.40	1.10	0.10
C200 NG CARB	Natural Gas (1)	0.14	0.20	0.04
CR200 Digester	Digester Gas (3)	0.40	3.6	0.10

Notes:

(1) Emissions for standard natural gas at 1,000 BTU/scf (HHV) or 39.4 MJ/m3 (HHV)
(2) Emissions for surrogate gas containing 42% natural gas, 39% CO2, and 19% Nitrogen
(3) Emissions for surrogate gas containing 63% natural gas and 37% CO2
(4) Emissions for Diesel #2 according to ASTM D975-07b
(5) Expressed as Methane

Table 2 provides the same output-based information shown in Table 1, but expressed in grams per horsepower hour (g/hp-hr).

Table 2. Emission for Different Capstone Microturbine Models in [g/hp-hr]

Model	Fuel	NOx	CO	VOC [5]
C30 NG	Natural Gas [1]	0.22	0.60	0.078
CR30 MBTU	Landfill Gas [2]	0.22	7.4	0.340
CR30 MBTU	Digester Gas [3]	0.22	3.7	0.340
C30 Liquid	Diesel #2 [4]	0.90	0.14	0.078
C65 NG Standard	Natural Gas [1]	0.16	0.42	0.034
C65 NG Low NOx	Natural Gas [1]	0.06	0.44	0.034
C65 NG CARB	Natural Gas [1]	0.06	0.08	0.017
CR65 Landfill	Landfill Gas [2]	0.16	1.4	0.034
CR65 Digester	Digester Gas [3]	0.16	1.4	0.034
C200 NG	Natural Gas [1]	0.14	0.37	0.034
C200 NG CARB	Natural Gas [1]	0.05	0.07	0.014
CR200 Digester	Digester Gas [3]	0.14	1.3	0.034

Notes: - same as for Table 1

Emissions may also be reported on a volumetric basis, with the most common unit of measurement being parts per million. This is typically a measurement that is corrected to specific oxygen content in the exhaust and without considering moisture content. The abbreviation for this unit of measurement is “ppmvd” (parts per million by volume, dry) and is corrected to 15% oxygen for electrical generating equipment such as microturbines. The relationship between an output based measurement like pounds per MWh and a volumetric measurement like ppmvd depends on the characteristics of the generating equipment and the molecular weight of the criteria pollutant being measured. Table 3 expresses the emissions in ppmvd at 15% oxygen for the Capstone microturbine models shown in Table 1. Note that raw measurements expressed in ppmv will typically be lower than the corrected values shown in Table 3 because the microturbine exhaust has greater than 15% oxygen.

Another volumetric unit of measurement expresses the mass of a specific criteria pollutant per standard unit of volume. Table 4 expresses the emissions in milligrams per normal cubic meter at 15% oxygen. Normal conditions for this purpose are expresses as one atmosphere of pressure and zero degrees Celsius. Note that both the ppmvd and mg/m3 measurements are for specific oxygen content. A conversion can be made to adjust either unit of measurement to other reference oxygen contents, if required. Use the equation below to convert from one reference oxygen content to another:

$$\text{Emissions at New } O_2 = \frac{(20.9 - \text{New } O_2 \text{ Percent})}{(20.9 - \text{Current } O_2 \text{ Percent})} \text{ X Emissions at Current } O_2$$

For example, to express 9 ppmvd of NOx at 15% oxygen to ppmvd at 3% oxygen:

$$\text{Emissions at 3\% } O_2 = \frac{(20.9 - 3.0)}{(20.9 - 15.0)} \text{ X } 9 = 27 \text{ ppmvd}$$

Table 3. Emission for Different Capstone Microturbine Models in [ppmvd] at 15% O_2

Model	Fuel	NOx	CO	VOC
C30 NG	Natural Gas (1)	9	40	9
CR30 MBTU	Landfill Gas (2)	9	500	40
CR30 MBTU	Digester Gas (3)	9	250	40
C30 Liquid	Diesel #2 (4)	35	9	9
C65 NG Standard	Natural Gas (1)	9	40	7
C65 NG Low NOx	Natural Gas (1)	4	40	7
C65 NG CARB	Natural Gas (1)	4	8	3
CR65 Landfill	Landfill Gas (2)	9	130	7
CR65 Digester	Digester Gas (3)	9	130	7
C200 NG	Natural Gas (1)	9	40	7
C200 NG CARB	Natural Gas (1)	4	8	3
CR200 Digester	Digester Gas (3)	9	130	7

Notes: same as Table 1

Table 4. Emission for Different Capstone Microturbine Models in [mg/m3] at 15% O_2

Model	Fuel	NOx	CO	VOC (5)
C30 NG	Natural Gas (1)	18	50	6
CR30 MBTU	Landfill Gas (2)	18	620	30
CR30 MBTU	Digester Gas (3)	18	310	30
C30 Liquid	Diesel #2 (4)	72	11	6
C65 NG Standard	Natural Gas (1)	19	50	5
C65 NG Low NOx	Natural Gas (1)	8	50	5
C65 NG CARB	Natural Gas (1)	8	9	2
CR65 Landfill	Landfill Gas (2)	18	160	5
CR65 Digester	Digester Gas (3)	18	160	5
C200 NG	Natural Gas (1)	18	50	5
C200 NG CARB	Natural Gas (1)	8	9	2
CR200 Digester	Digester Gas (3)	18	160	5

Notes: same as Table 1

The emissions stated in Tables 1, 2, 3 and 4 are guaranteed by Capstone for new microturbines during the standard warranty period. They are also the expected emissions for a properly maintained microturbine according to manufacturer's published maintenance schedule for the useful life of the equipment.

Emissions at Full Power but Not at ISO Conditions

The maximum emissions in Tables 1, 2, 3 and 4 are at full power under ISO conditions. These levels are also the expected values at full power operation over the published allowable ambient temperature and elevation ranges.

Emissions at Part Power

Capstone microturbines are designed to maintain combustion stability and low emissions over a wide operating range. Capstone microturbines utilize multiple fuel injectors, which are switched on or off depending on the power output of the turbine. All injectors are typically on when maximum power is demanded, regardless of the ambient temperature or elevation. As the load requirements of the microturbine are decreased, injectors will be switched off to maintain stability and low emissions. However, the emissions relative to the lower power output may increase. This effect differs for each microturbine model.

Emissions Calculations for Permitting

Air Permitting agencies are normally concerned with the maximum amount of a given pollutant being emitted per unit of time (for example pounds per day of NOx). The simplest way to make this calculation is to use the maximum microturbine full electrical power output (expressed in MW) multiplied by the emissions rate in pounds per MWhe times the number of hours per day. For example, the C65 CARB microturbine operating on natural gas would have a NOx emissions rate of:

NOx = .17 X (65/1000) X 24 = .27 pounds per day

This would be representative of operating the equipment full time, 24 hours per day, at full power output of 65 kWe.

As a general rule, if local permitting is required, use the published agency levels as the stated emissions for the permit and make sure that this permitted level is above the calculated values in this technical reference.

Consideration of Useful Thermal Output

Capstone microturbines are often deployed where their clean exhaust can be used to provide heating or cooling, either directly or using hot water or other heat transfer fluids. In this case, the local permitting or standards agencies will usually consider the emissions from traditional heating sources as being displaced by the useful thermal output of the microturbine exhaust energy. This increases the useful output of the microturbine, and decreases the relative emissions of the combined heat and power system. For example, the CARB version C65 ICHP system with integral heat recovery can achieve a total system efficiency of 70% or more, depending on inlet water temperatures and other installation-specific characteristics. The electric efficiency of the CARB version C65 microturbine is 28% at ISO conditions. This means that the total NOx output based emissions, including the captured thermal value, is the electric-only emissions times the ratio of electric efficiency divided by total system efficiency:

NOx = .17 X 28/70 = .068 pounds per MWh (based on total system output)

This is typically much less than the emissions that would result from providing electric power using traditional central power plants, plus the emissions from a local hot water heater or boiler. In fact microturbine emissions are so low compared with traditional hot water heaters that installing a Capstone microturbine with heat recovery can actually decrease the local emissions of NOx and other criteria pollutants, without even considering the elimination of emissions from a remote power plant.

Greenhouse Gas Emissions

Many gasses are considered "greenhouse gasses", and agencies have ranked them based on their global warming potential (GWP) in the atmosphere compared with carbon dioxide (CO_2), as well as their ability to maintain this effect over time. For example, methane is a greenhouse gas with a GWP of 21. Criteria pollutants like NOx and organic compounds like methane are monitored by local air permitting authorities, and are subject to strong emissions controls. Even though some of these criteria pollutants can be more troublesome for global warming than CO_2, they are released in small quantities – especially from Capstone microturbines. So the major contributor of concern is carbon dioxide, or CO_2. Emission of CO_2 depends on two things:

1. Carbon content in the fuel
2. Efficiency of converting fuel to useful energy

It is for these reasons that many local authorities are focused on using clean fuels (for example natural gas compared with diesel fuel), achieving high efficiency using combined heat and power systems, and displacing emissions from traditional power plants using renewable fuels like waste landfill and digester gasses.

Table 5 shows the typical CO_2 emissions due to combustion for different Capstone microturbine models at full power and ISO conditions. The values do not include CO_2 that may already exist in the fuel itself, which is typical for renewable fuels like landfill and digester gas. These values are expressed on an output basis, as is done for criteria pollutants in Table 1. The table shows the pounds per megawatt hour based on electric power output only, as well as considering total useful output in a CHP system with total 70% efficiency (LHV). As for criteria pollutants, the relative quantity of CO_2 released is substantially less when useful thermal output is also considered in the measurement.

Table 5. CO_2 Emission for Capstone Microturbine Models in [lb/MWh]

Model	Fuel	CO_2	
		Electric Only	70% Total CHP
C30 NG	Natural Gas (1)	1,690	625
CR30 MBTU	Landfill Gas (1)	1,690	625
CR30 MBTU	Digester Gas (1)	1,690	625
C30 Liquid	Diesel #2 (2)	2,400	855
C65 NG Standard	Natural Gas (1)	1,520	625
C65 NG Low NOx	Natural Gas (1)	1,570	625
C65 NG CARB	Natural Gas (1)	1,570	625
CR65 Landfill	Landfill Gas (1)	1,520	625
CR65 Digester	Digester Gas (1)	1,520	625
C200 NG	Natural Gas (1)	1,330	625
C200 NG CARB	Natural Gas (1)	1,330	625
CR200 Digester	Digester Gas (1)	1,330	625

Notes:

(1) Emissions due to combustion, assuming natural gas with CO_2 content of 117 lb/MMBTU (HHV)

(2) Emissions due to combustion, assuming diesel fuel with CO_2 content of 160 lb/MMBTU (HHV)

Useful Conversions

The conversions shown in Table 6 can be used to obtain other units of emissions outputs. These are approximate conversions.

Table 6. Useful Unit Conversions

From	Multiply By	To Get
lb/MWh	0.338	g/bhp-hr
g/bhp-hr	2.96	lb/MWh
lb	0.454	kg
kg	2.20	lb
kg	1,000	g
hp (electric)	.746	kW
kW	1.34	hp (electric)
MW	1,000	kW
kW	0.001	MW

Definitions

- ISO conditions are defined as: 15 °C (59 °F), 60% relative humidity, and sea level pressure of 101.3 kPa (14.696 psia).
- HHV: Higher Heating Value
- LHV: Lower Heating Value
- kW_{th}: Kilowatt (thermal)
- kW_e : Kilowatt (electric)
- MWh: Megawatt-hour
- hp-hr: horsepower-hour (sometimes referred to as “electric horsepower-hour”)
- Scf: Standard cubic foot (standard references ISO temperature and pressure)
- m3: Normal cubic meter (normal references 0 °C and one atmosphere pressure)

Capstone Contact Information

If questions arise regarding this technical reference, please contact Capstone Turbine Corporation for assistance and information:

Capstone Applications

Toll Free Telephone: (866) 4-CAPSTONE or (866) 422-7786

Fax: (818) 734-5385

E-mail: applications@capstoneturbine.com

Performance Specification

Performance Ratings at Full Load Power

Table 2 summarizes performance ratings at full load power and ISO conditions.

Table 2. Performance Ratings

Parameter	C200 Low Pressure NG	All Other C200[3]
Net Power Output	190 (□0/- 4) kW net	200 (□0/- 4) kW net
Net Efficiency (LHV)	31 (□2)%	33 (□2)%
Nominal Net Heat Rate (LHV)	11,600 kJ/kWh (11,000 Btu/kWh)	10,900 kJ/kWh (10,300 Btu/kWh)
Nominal Generator Heat Rate (LHV)	10,700 kJ/kWh (10,200 Btu/kWh)	10,200 kJ/kWh (9,700 Btu/kWh)
Nominal Steady State Fuel Flow (HHV) [1] [2]	2,400,000 kJ/hr (2,280,000 BTU/hr)	2,400,000 kJ/hr (2,280,000 BTU/hr)

Notes:

(1) The ratio of Higher Heating □alue (HH□) to Lower Heating □alue (LH□) is assumed to be 1.1.

(2) Onload fuel flows can be up to two times higher than the steady state values.

(3) Liquid fuel systems will experience a minimal parasitic load due to fuel pump power requirements. This will have a minimal impact on net efficiency.

CAMERON

NATCO BTEX BUSTER

WELL SITE MIDSTREAM

Removes 99.7%* of BTEX and VOC emissions from glycol reconcentrator emissions

The Simple and Cost-effective Answer to Your Emission Compliance Problems

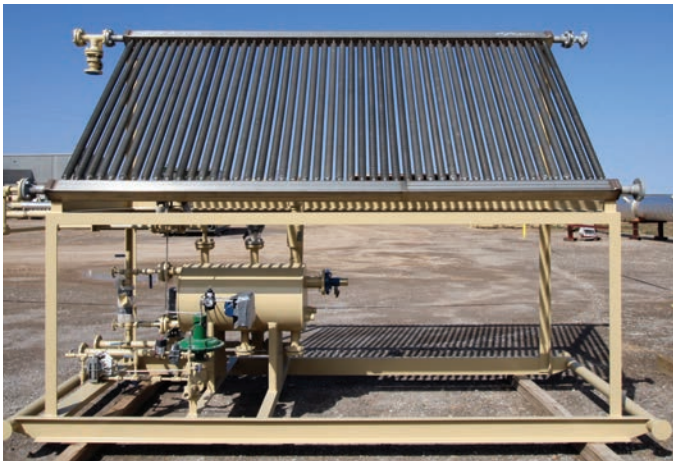
Cameron's NATCO® BTEX BUSTER® provides a removal efficiency greater than 99.7%*, helps recover and collect saleable liquid hydrocarbons and prevents the loss of expensive fuel gas from glycol reconcentrator vent emissions.

The unit is designed using the Environmental Protection Agency-approved Gri-Glycalc computer simulation program with a flash-gas separator in the glycol regeneration process. Under common operating conditions, BTEX (benzene, toluene, ethylbenzene and xylene), as well as other volatile organic compounds (VOCs), are emitted into the atmosphere during the glycol regeneration process. The rates usually are proportional to the glycol circulation rate.

The NATCO BTEX BUSTER captures those hydrocarbon emissions.

Performance

- The cost-effective system is designed to assist operators in reducing BTEX and VOC emissions below the accepted levels and complies with federal and state environmental regulations.
- Economics of the NATCO BTEX BUSTER show that it can pay for itself by recovering saleable hydrocarbon liquids and fuel gas. By condensing troublesome glycol reconcentrator vapors and routing flash gas back to the reconcentrator fuel gas inlet for burning, the unit reduces emissions during glycol plant dehydration processing.
- The NATCO BTEX BUSTER incorporates field-proven burner accessories to help prevent sooting and backpressure on your regeneration system.
- The NATCO BTEX BUSTER also features a design to eliminate potential freeze-up problems when operating in severe cold climates.
- Cameron offers the NATCO BTEX BUSTER in standard sizes to accommodate most customer needs. Our units are backed by Cameron's replacement parts, technical assistance and service available 24 hours a day.



The NATCO BTEX BUSTER cold-weather design eliminates freezing problems associated with cold climates.

How It Works

The NATCO BTEX BUSTER is a relatively simple process that is designed to maintain greater than 99.7%* removal of BTEX and VOC emissions.

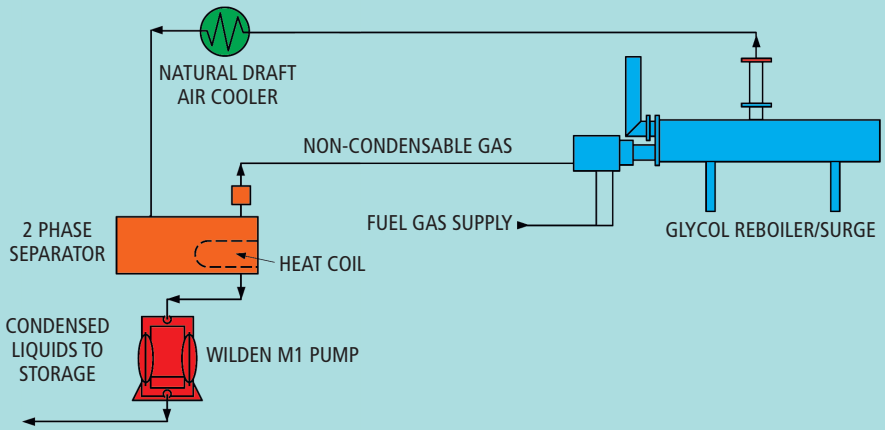
The vapors emitted from the glycol still column are cooled in the natural draft air cooler to temperatures below 120° F (49° C).

The condensed liquids are collected in a small two-phase separator and pumped to customer storage. Non-condensable gases from the separator are piped through an in-line flash arrestor and then burned in the glycol reboiler firebox to achieve an overall minimum destruction efficiency of 99.7%* plus.

Features	Benefits
Ideal for Remote Locations	Natural draft self-regulating system does not require any moving pieces of equipment.
Environmentally Correct	Meets Federal Regulation 40 CFR part 63 and meets or exceeds most stringent state regulations LAC 111.2116 and LAC 33:111 chapter 51.
Efficient	Removal efficiency is greater than 99.7%*.
Reduces Operating Costs	Reduces fuel gas consumption and recovers saleable liquid hydrocarbons.
Safe	Features an in-line flash arrestor, high-level switch, pressure safety valve and gas shut-down valves.
Designed for the Oil Field	Includes field-proven burner products, and the pneumatic pump handles aromatic hydrocarbons.
Designed for Cold Weather	Cold-weather design eliminates freezing problems associated with cold climates.
Cameron's Services	Includes experienced staff and worldwide locations, 24 hours a day.

CAMERON

NATCO BTEX BUSTER SKID UNIT



Built-in Safety Features

The NATCO BTEX BUSTER is engineered with proper controls for safe operation and long in-service life. These include an in-line flash arrestor, separator high-level switch, pressure safety valve and gas shut-down valves for high reboiler bath temperatures. It also incorporates field-proven burner accessories that help to prevent typical sooting and backpressures on your regeneration system.

Field-proven, the NATCO BTEX BUSTER now is available through our sales and service locations worldwide.

Standard BTEX Size (1)	Reconcentrator Duty Btu/hr	Glycol Pump gal/hr	Max Capacity water/day (2)	Non-condensable vapor/day (3)	Cooler Duty Btu/hr (3)
150	75,000	40	273	7	30,000
150	150,000	40	273	10	30,000
250	250,000	90	1216	27	51,000
375	375,000	210	1807	45	76,000
550	550,000	210	2650	60	112,000
750	750,000	450	3615	100	152,000

(1) Standard BTEX
Performance of unit is based on a non-condensable vapor HHV greater than 400 Btu/cf and less than 1800 Btu/cf and a glycol circulation rate of no more than 3 gal/lb of water removed.

(2) Maximum Capacity of Water/day
Represents the maximum capacity of water in pounds per day for each of Cameron's standard reboiler size based on a glycol circulation rate of 2 gallons of glycol per pound of water removed.

(3) Non-condensable Vapor/day
Maximum non-condensable vapor rate was calculated with the Gri-Glycalc computer simulation program with a flash-gas separator used in the glycol regeneration process and a BTEX concentration in the inlet gas stream of no more than 700 ppm.
Using adiabatic combustion calculations, a minimum of 99.7%* of these non-condensable vapors are destroyed.

(4) Cooler Duty Btu/hr
Cooler duty was calculated based on a prevailing windspeed of 3 mph and a maximum ambient temperature of 100° F (38° C).

Note: Cameron is not responsible for the disposal of any condensed liquids associated with its BTEX BUSTER units.

** Certain gas streams contain more BTEX and VOCs than represented by Gri-Glycalc. Consult with Cameron's engineers for system evaluation, equipment sizing and application to ensure conversion efficiency.*

LOCATIONS

United States of America
11210 Equity Dr., Suite 100
Houston, TX 77041
USA
Tel 713.849.7500

Marcellus/Utica
Laceyville 570.869.3104
Nitro 304.755.9400

Midcontinent
Oklahoma City 405.677.8827

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Casper 307.234.7183
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Williston 701.774.5500

Texas
Caldwell 979.272.7101
Corpus Christi 361.289.0488
Godley 817.389.2676
Longview 903.759.2738
Odessa 432.530.3600

Canada
Leduc 780.986.9803

www.c-a-m.com

Installing Vapor Recovery Units on Storage Tanks

Executive Summary

There are about 500,000 crude oil storage tanks in the United States. These tanks are used to hold oil for brief periods of time in order to stabilize flow between production wells and pipeline or trucking transportation sites. In addition, the condensate liquids contained in produced gas that are captured by a mist eliminator filter/ coalescer ahead of the first compressor station in transmission pipelines are often directed to a storage tank as well. During storage, light hydrocarbons dissolved in the crude oil or condensate—including methane and other volatile organic compounds (VOC), natural gas liquids (NGLs), hazardous air pollutants (HAP), and some inert gases—vaporize or "flash out" and collect in the space between the liquid and the fixed roof of the tank. As the liquid level in the tank fluctuates, these vapors are often vented to the atmosphere.

One way to prevent emissions of these light hydrocarbon vapors and yield significant economic savings is to install vapor recovery units (VRUs) on storage tanks. VRUs are relatively simple systems that can capture about 95 percent of the Btu-rich vapors for sale or for use onsite as fuel. Currently, between 7,000 and 9,000 VRUs are installed in the oil production sector, with an average of four tanks connected to each VRU.

Natural Gas STAR partners have generated significant savings from recovering and marketing these vapors while at the same time substantially reducing methane and HAP emissions. Partners have found that when the volume of vapors is sufficient, installing a VRU on one or multiple storage tanks can save up to $606,800 per year and payback in as little as two months. This Lessons Learned study describes how partners can identify when and where VRUs should be installed to realize these economic and environmental benefits.

Technology Background

Underground crude oil contains many lighter hydrocarbons in solution. When the oil is brought to the surface and processed, many of the dissolved lighter hydrocarbons (as well as water) are removed through a series of high-pressure and low-pressure separators. The crude oil is then injected into a storage tank to await sale and transportation off site; the remaining hydrocarbons in the oil are emitted as vapors into the tank. The same principles apply for condensate, which accumulates as a result of the conditions within the pipelines and is removed ahead of the first compressor station. The recovered condensate, which contains dissolved light hydrocarbons, is routed to a storage tank where the dissolved light hydrocarbons are emitted as vapors. These vapors are either vented, flared, or recovered by vapor recovery units (VRUs). Losses of the remaining lighter hydrocarbons are categorized in three ways:

- ★ Flash losses occur when the separator or heater treater, operating at approximately 35 pounds per square inch (psi), dumps oil into the storage tanks, which are at atmospheric pressure.
- ★ Working losses refer to the vapor released from the

Economic and Environmental Benefits

Method for Reducing Natural Gas Losses	Volume of Natural Gas Savings (Mcf/yr)	Value of Natural Gas Savings ($/yr) [1]			Implementation Cost ($)	Other Costs ($)	Payback (Months)		
		$3 per Mcf	$5 per Mcf	$7 per Mcf			$3 per Mcf	$5 per Mcf	$7 per Mcf
Installing Vapor Recovery Units (VRUs) on Oil Production Storage Tanks	4,900—96,000	$13,965—$273,600	$23,275—$456,000	$32,585—$638,400	$35,738—$103,959	$7,367—$16,839	6 — 37	4 — 23	3 — 16

[1] Assumes 95% of the annual volume of gas lost can be recovered using a VRU.

changing fluid levels and agitation of tank contents associated with the circulation of fresh oil through the storage tanks.

★ Standing losses occur with daily and seasonal temperature changes.

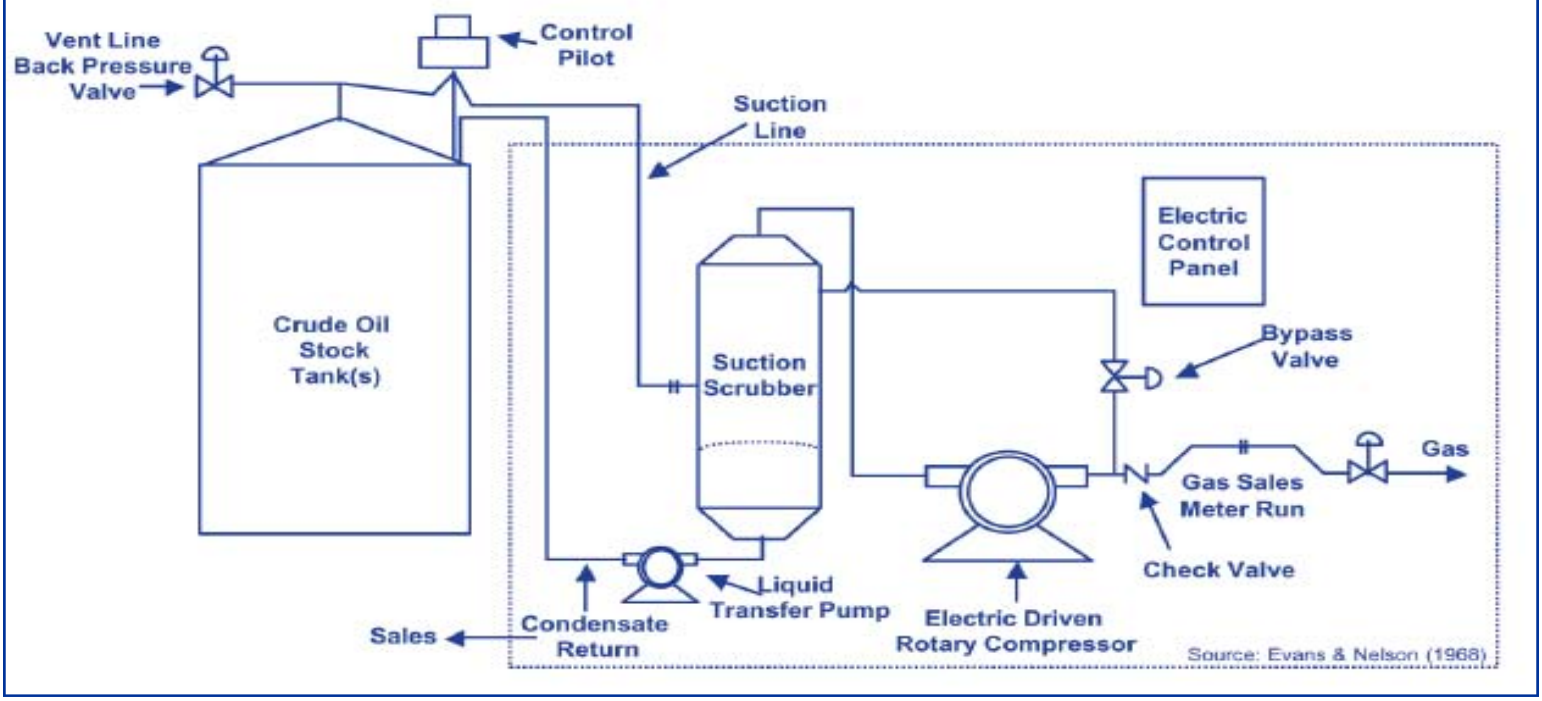
The volume of gas vapor coming off a storage tank depends on many factors. Lighter crude oils (API gravity>36°) flash more hydrocarbon vapors than heavier crudes (API gravity<36°). In storage tanks where the oil is frequently cycled and the overall throughput is high, more "working vapors" will be released than in tanks with low throughput and where the oil is held for longer periods and allowed to "weather." Finally, the operating temperature and pressure of oil in the vessel dumping into the tank will affect the volume of flashed gases coming out of the oil.

The makeup of these vapors varies, but the largest component is methane (between 40 and 60 percent). Other components include more complex hydrocarbon compounds such as propane, butane, and ethane; natural inert gases such as nitrogen and carbon dioxide; and HAP like benzene, toluene, ethyl-benzene, and xylene (collectively these four HAP are referred to as BTEX).

VRUs can recover over 95 percent of the hydrocarbon emissions that accumulate in storage tanks. Because recovered vapors contain natural gas liquids (even after condensates have been captured by the suction scrubber), they have a Btu content that is higher than that of pipeline quality natural gas (between 950 and 1,100 Btu per standard cubic foot [scf]). Depending on the volume of NGLs in the vapors, the Btu content can reach as high as 2,000 Btu per scf. Therefore, on a volumetric basis, the recovered vapors can be more valuable than methane alone.

Exhibit 1 illustrates a VRU installed on a single crude oil storage tank (multiple tank installations are also common). Hydrocarbon vapors are drawn out of the storage (stock) tank under low-pressure, typically between four ounces and two psi, and are first piped to a separator (suction scrubber) to collect any liquids that condense out. The liquids are usually recycled back to the storage tank. From the separator, the vapors flow through a compressor that provides the low-pressure suction for the VRU system. (To prevent the creation of a vacuum in the top of a tank when oil is withdrawn and the oil level drops, VRUs are equipped with a control pilot to shut down the compressor and permit the back flow of vapors into the tank.) The vapors are then metered and removed from the VRU system for pipeline sale or onsite fuel supply.

Exhibit 1: Standard Stock Tank Vapor Recovery System



CARBTROL®

AIR PURIFICATION CANISTERS 140-200 LB. ACTIVATED CARBON

G-1
G-2
G-3

The CARBTROL "G" Canisters handles flows up to 500 CFM.

FEATURES

- High activity carbon.
- Epoxy lined steel or polyethylene construction.
- Acceptable for transport of hazardous spent carbon.
- Side drain for removal of accumulated condensate.
- Low pressure drop.
- PVC internal piping.
- High temperature (180°F) steel units available.

APPLICATIONS

- Soil vapor remediation
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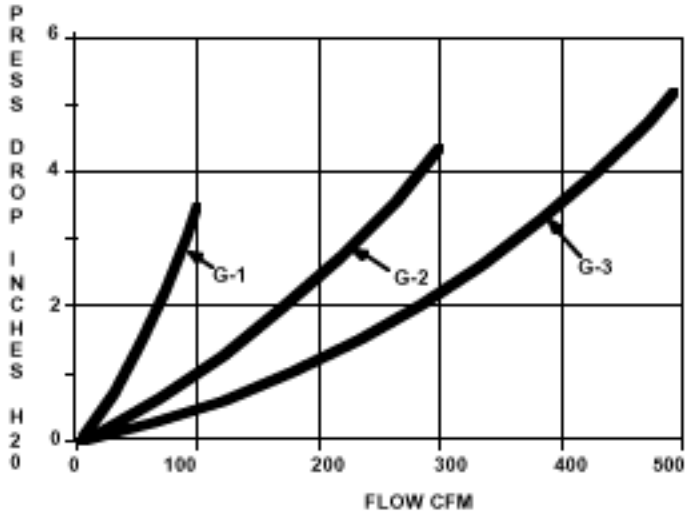
- Sewage plant odor control



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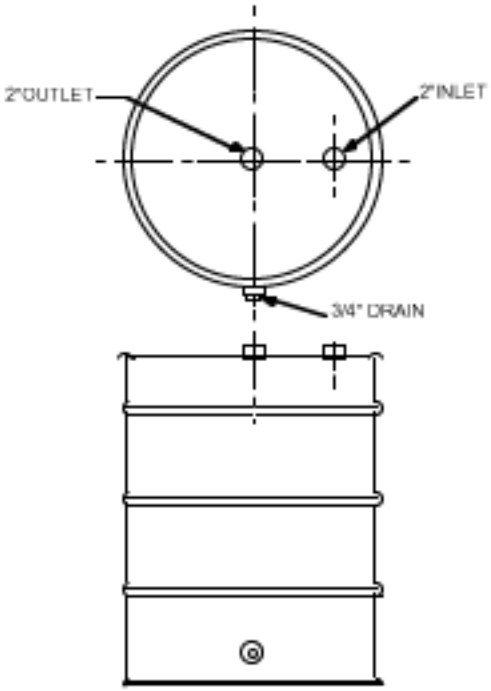
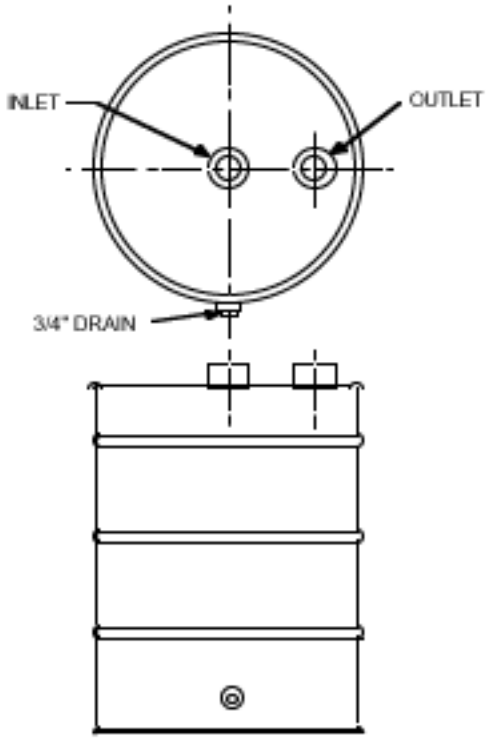


MODEL G-1



MODEL G-2,G-3

SPECIFICATIONS

MODEL	DIAMETER/HEIGHT	CARBON WEIGHT	INLET/OUTLET	MAXIMUM RATED FLOW	APPROXIMATE SHIP WEIGHT
G-1*	24"/36"	200 lbs.	2"/2"	100 CFM	250 lbs.
G-2*	24"/36"	170 lbs.	4"/4"	300 CFM	220 lbs.
G-3P	24"/36"	140 lbs.	6"/6"	500 CFM	190 lbs.
G-3S	24"/34"	140 lbs.	4"/4"	500 CFM	180 lbs.

* Specify: Polyethylene (P) or Epoxy Lined Steel (S)

SAFETY

Certain chemical compounds in the presence of activated carbon may oxidize, decompose or polymerize. This could result in temperature increases sufficient to cause ignition of the activated carbon or adsorbed material. If a compounds reaction with activated carbon is unknown, appropriate tests should be considered.

CARBTROL® CORPORATION
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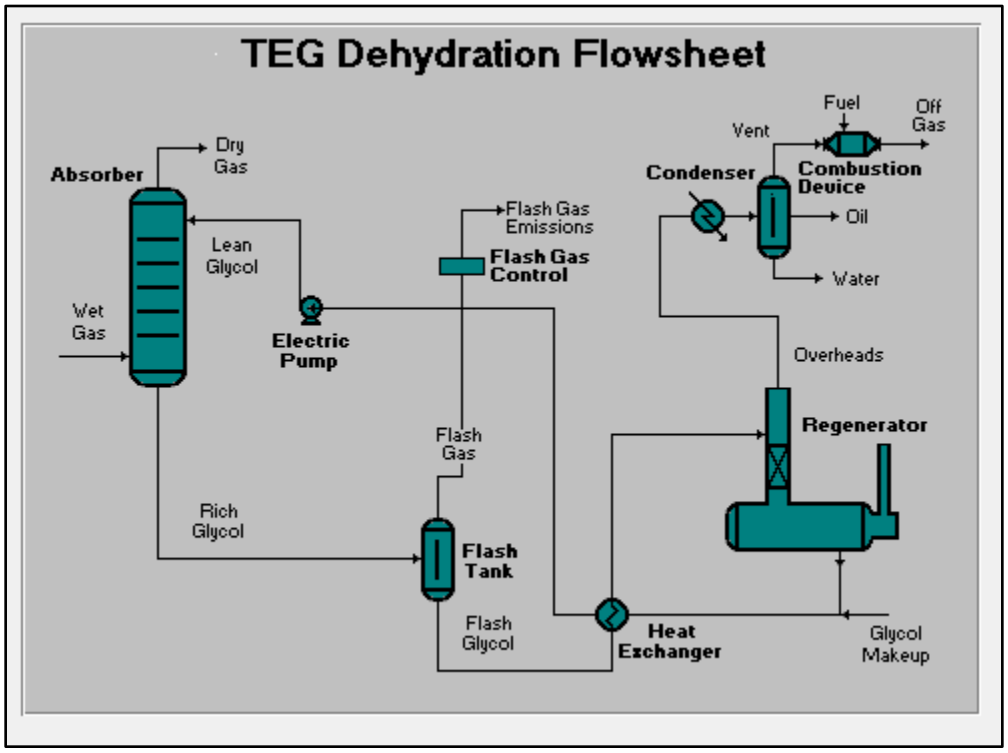
Supplement S6

Emission Program Data

- **EPA Tanks 4.0.9d – Condensate Storage Tanks (TK-01 thru TK-10)**
- **EPA Tanks 4.0.9d – Produced Fluid/Water Storage Tanks (WTK-11 and WTK-12)**
- **GRI-GLYCalc – Dehydrators (STL-01 thru STL-03)**



Stabilized Condensate (SC) – Storage Tank (TK 01-10)

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

Identification

User Identification:	AMS-Miller CS
City:	Bannen
State:	West Virginia
Company:	Appalachia Midstream Services, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	400 bbl Condensate VFR Tank (Assume Gasoline RVP 15)

Tank Dimensions

Shell Height (ft):	20.00
Diameter (ft):	12.00
Liquid Height (ft) :	20.00
Avg. Liquid Height (ft):	10.00
Volume (gallons):	16,800.00
Turnovers:	75.00
Net Throughput(gal/yr):	1,205,600.00
Is Tank Heated (y/n):	N

Paint Characteristics

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

S **Roof Characteristics**

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

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

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

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

AMS-Miller CS - Vertical Fixed Roof Tank
Bannen, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 15.0)	All	58.50	49.32	67.67	53.39	7.9267	6.6758	9.3559	60.0000			92.00	Option 4: RVP=15, ASTM Slope=3

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

Emissions Report for: Annual

AMS-Miller CS - Vertical Fixed Roof Tank
Bannen, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 15.0)	7,736.15	3,365.94	11,102.09

Produced Fluid/Water (PW) – Storage Tank (TK 01-10)

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

Identification

User Identification:	AMS-Miller CS-Produced Fluids/Water-
City:	Bannen
State:	West Virginia
Company:	Appalachia Midstream Services, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	400 bbl Produced Fluids/Water VFR Tank (Assume 10% Gasoline RVP 15)

Tank Dimensions

Shell Height (ft):	20.00
Diameter (ft):	12.00
Liquid Height (ft) :	20.00
Avg. Liquid Height (ft):	10.00
Volume (gallons):	16,800.00
Turnovers:	9.13
Net Throughput(gal/yr):	153,300.00
Is Tank Heated (y/n):	N

Paint Characteristics

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

Roof Characteristics

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

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

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

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

AMS-Miller CS-Produced Fluids/Water- - Vertical Fixed Roof Tank
Bannen, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 15.0)	All	58.50	49.32	67.67	53.39	7.9267	6.6758	9.3559	60.0000			92.00	Option 4: RVP=15, ASTM Slope=3

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

Emissions Report for: Annual

AMS-Miller CS-Produced Fluids/Water- - Vertical Fixed Roof Tank
Bannen, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 15.0)	1,735.95	3,365.94	5,101.89

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: 2022-AMS-Miller CS-NSR-Electric-55 MMscf-GLYCalc.080822
File Name: D:\2022-Ecologic\AMS\AMS-Miller CS\10.942-AMS-Miller CS-Amend NSR-080222\008a-S3c-AMS-Miller CS-45CSR13 Mod-55 MMscf-GLYCalc-Electric-092322.ddf
Date: September 27, 2022

DESCRIPTION:

Description: 55 MMscfd/80oF/12,000 psig
15 gpm Electric Pump
80 oF/1000 psig/98% Control

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

The calculated flow rate is less than 0.000001 MMSCF/day.
The stream emissions are not reported.

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	1.5205	36.493	6.6599
Ethane	4.6853	112.448	20.5218
Propane	4.8806	117.134	21.3770
Isobutane	1.5024	36.058	6.5805
n-Butane	3.6761	88.227	16.1015
Isopentane	1.2508	30.020	5.4787
n-Pentane	1.4799	35.517	6.4818
n-Hexane	0.9076	21.782	3.9752
Cyclohexane	0.4839	11.614	2.1196
Other Hexanes	1.5436	37.047	6.7611
Heptanes	1.7700	42.481	7.7527
Methylcyclohexane	1.1290	27.096	4.9450
2,2,4-Trimethylpentane	0.0148	0.355	0.0648
Benzene	0.8887	21.328	3.8923
Toluene	1.3945	33.468	6.1079
Ethylbenzene	0.1886	4.527	0.8262
Xylenes	6.1220	146.928	26.8144
C8+ Heavies	1.5289	36.694	6.6967
Total Emissions	34.9674	839.218	153.1573
Total Hydrocarbon Emissions	34.9674	839.218	153.1573
Total VOC Emissions	28.7616	690.277	125.9756
Total HAP Emissions	9.5162	228.389	41.6810
Total BTEX Emissions	8.5938	206.252	37.6409

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr

Methane	0.4533	10.880	1.9857
Ethane	0.3257	7.817	1.4265
Propane	0.1441	3.458	0.6310
Isobutane	0.0257	0.617	0.1126
n-Butane	0.0453	1.088	0.1985
Isopentane	0.0122	0.293	0.0535
n-Pentane	0.0110	0.263	0.0481
n-Hexane	0.0032	0.078	0.0142
Cyclohexane	0.0004	0.010	0.0018
Other Hexanes	0.0076	0.183	0.0334
Heptanes	0.0026	0.063	0.0116
Methylcyclohexane	0.0007	0.016	0.0030
2,2,4-Trimethylpentane	<0.0001	0.001	0.0002
Benzene	0.0001	0.002	0.0004
Toluene	0.0001	0.002	0.0003
Ethylbenzene	<0.0001	<0.001	<0.0001
Xylenes	0.0001	0.003	0.0005
C8+ Heavies	0.0003	0.007	0.0013
Total Emissions	1.0326	24.781	4.5226
Total Hydrocarbon Emissions	1.0326	24.781	4.5226
Total VOC Emissions	0.2535	6.084	1.1104
Total HAP Emissions	0.0036	0.085	0.0156
Total BTEX Emissions	0.0003	0.007	0.0012

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	22.6673	544.015	99.2827
Ethane	16.2848	390.835	71.3273
Propane	7.2037	172.889	31.5522
Isobutane	1.2858	30.859	5.6318
n-Butane	2.2662	54.390	9.9262
Isopentane	0.6113	14.671	2.6775
n-Pentane	0.5486	13.167	2.4029
n-Hexane	0.1619	3.884	0.7089
Cyclohexane	0.0206	0.493	0.0900
Other Hexanes	0.3813	9.151	1.6700
Heptanes	0.1322	3.173	0.5791
Methylcyclohexane	0.0337	0.810	0.1478
2,2,4-Trimethylpentane	0.0024	0.057	0.0104
Benzene	0.0042	0.101	0.0184
Toluene	0.0037	0.089	0.0162
Ethylbenzene	0.0003	0.006	0.0011
Xylenes	0.0055	0.131	0.0239
C8+ Heavies	0.0144	0.346	0.0631
Total Emissions	51.6278	1239.066	226.1296
Total Hydrocarbon Emissions	51.6278	1239.066	226.1296
Total VOC Emissions	12.6757	304.217	55.5195
Total HAP Emissions	0.1778	4.268	0.7789
Total BTEX Emissions	0.0136	0.326	0.0596

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr

Methane	0.4533	10.880	1.9857
Ethane	0.3257	7.817	1.4265
Propane	0.1441	3.458	0.6310
Isobutane	0.0257	0.617	0.1126
n-Butane	0.0453	1.088	0.1985
Isopentane	0.0122	0.293	0.0535
n-Pentane	0.0110	0.263	0.0481
n-Hexane	0.0032	0.078	0.0142
Cyclohexane	0.0004	0.010	0.0018
Other Hexanes	0.0076	0.183	0.0334
Heptanes	0.0026	0.063	0.0116
Methylcyclohexane	0.0007	0.016	0.0030
2,2,4-Trimethylpentane	<0.0001	0.001	0.0002
Benzene	0.0001	0.002	0.0004
Toluene	0.0001	0.002	0.0003
Ethylbenzene	<0.0001	<0.001	<0.0001
Xylenes	0.0001	0.003	0.0005
C8+ Heavies	0.0003	0.007	0.0013
Total Emissions	1.0326	24.781	4.5226
Total Hydrocarbon Emissions	1.0326	24.781	4.5226
Total VOC Emissions	0.2535	6.084	1.1104
Total HAP Emissions	0.0036	0.085	0.0156
Total BTEX Emissions	0.0003	0.007	0.0012

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction
Methane	105.9427	1.9857	98.13
Ethane	91.8491	1.4265	98.45
Propane	52.9292	0.6310	98.81
Isobutane	12.2123	0.1126	99.08
n-Butane	26.0276	0.1985	99.24
Isopentane	8.1561	0.0535	99.34
n-Pentane	8.8848	0.0481	99.46
n-Hexane	4.6842	0.0142	99.70
Cyclohexane	2.2097	0.0018	99.92
Other Hexanes	8.4311	0.0334	99.60
Heptanes	8.3318	0.0116	99.86
Methylcyclohexane	5.0928	0.0030	99.94
2,2,4-Trimethylpentane	0.0752	0.0002	99.72
Benzene	3.9108	0.0004	99.99
Toluene	6.1241	0.0003	99.99
Ethylbenzene	<0.0001	<0.0001	100.00
Xylenes	26.8383	0.0005	100.00
C8+ Heavies	6.7598	0.0013	99.98
Total Emissions	379.2869	4.5226	98.81
Total Hydrocarbon Emissions	379.2869	4.5226	98.81
Total VOC Emissions	181.4951	1.1104	99.39
Total HAP Emissions	42.4599	0.0156	99.96
Total BTEX Emissions	37.7005	0.0012	100.00

EQUIPMENT REPORTS:

CONDENSER AND COMBUSTION DEVICE

Condenser Outlet Temperature:	120.00 deg. F
Condenser Pressure:	14.80 psia
Condenser Duty:	1.09e-001 MM BTU/hr
Hydrocarbon Recovery:	0.80 bbls/day
Produced Water:	4.80 bbls/day
Ambient Temperature:	80.00 deg. F
Excess Oxygen:	5.00 %
Combustion Efficiency:	100.00 %
Supplemental Fuel Requirement:	1.09e-001 MM BTU/hr

Component	Emitted	Destroyed
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.00%	100.00%
n-Pentane	0.00%	100.00%
n-Hexane	0.00%	100.00%
Cyclohexane	0.00%	100.00%
Other Hexanes	0.00%	100.00%
Heptanes	0.00%	100.00%
Methylcyclohexane	0.00%	100.00%
2,2,4-Trimethylpentane	0.00%	100.00%
Benzene	0.00%	100.00%
Toluene	0.00%	100.00%
Ethylbenzene	0.00%	100.00%
Xylenes	0.00%	100.00%
C8+ Heavies	0.00%	100.00%

ABSORBER

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

Calculated Absorber Stages:	1.25
Calculated Dry Gas Dew Point:	1.22 lbs. H2O/MMSCF
Temperature:	80.0 deg. F
Pressure:	1000.0 psig
Dry Gas Flow Rate:	55.0000 MMSCF/day
Glycol Losses with Dry Gas:	0.5543 lb/hr
Wet Gas Water Content:	Saturated
Calculated Wet Gas Water Content:	32.32 lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	12.62 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.77%	96.23%
Carbon Dioxide	99.56%	0.44%
Nitrogen	99.96%	0.04%

Methane	99.97%	0.03%
Ethane	99.91%	0.09%
Propane	99.87%	0.13%
Isobutane	99.82%	0.18%
n-Butane	99.77%	0.23%
Isopentane	99.78%	0.22%
n-Pentane	99.71%	0.29%
n-Hexane	99.55%	0.45%
Cyclohexane	97.89%	2.11%
Other Hexanes	99.66%	0.34%
Heptanes	99.22%	0.78%
Methylcyclohexane	97.85%	2.15%
2,2,4-Trimethylpentane	99.69%	0.31%
Benzene	81.08%	18.92%
Toluene	74.89%	25.11%
Ethylbenzene	70.58%	29.42%
Xylenes	61.85%	38.15%
C8+ Heavies	98.80%	1.20%

FLASH TANK

Flash Control: Combustion device
Flash Control Efficiency: 98.00 %
Flash Temperature: 80.0 deg. F
Flash Pressure: 60.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.99%	0.01%
Carbon Dioxide	53.57%	46.43%
Nitrogen	6.15%	93.85%
Methane	6.29%	93.71%
Ethane	22.34%	77.66%
Propane	40.39%	59.61%
Isobutane	53.88%	46.12%
n-Butane	61.86%	38.14%
Isopentane	67.34%	32.66%
n-Pentane	73.09%	26.91%
n-Hexane	84.94%	15.06%
Cyclohexane	96.06%	3.94%
Other Hexanes	80.39%	19.61%
Heptanes	93.08%	6.92%
Methylcyclohexane	97.21%	2.79%
2,2,4-Trimethylpentane	86.35%	13.65%
Benzene	99.55%	0.45%
Toluene	99.76%	0.24%
Ethylbenzene	99.88%	0.12%
Xylenes	99.92%	0.08%
C8+ Heavies	99.18%	0.82%

REGENERATOR

No Stripping Gas used in regenerator.

	Remaining	Distilled

Component	in Glycol	Overhead
Water	63.97%	36.03%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.74%	99.26%
n-Pentane	0.68%	99.32%
n-Hexane	0.59%	99.41%
Cyclohexane	3.33%	96.67%
Other Hexanes	1.24%	98.76%
Heptanes	0.54%	99.46%
Methylcyclohexane	4.12%	95.88%
2,2,4-Trimethylpentane	1.74%	98.26%
Benzene	5.02%	94.98%
Toluene	7.89%	92.11%
Ethylbenzene	10.35%	89.65%
Xylenes	12.80%	87.20%
C8+ Heavies	12.01%	87.99%

STREAM REPORTS:

WET GAS STREAM

Temperature: 80.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 2.29e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.81e-002	7.42e+001
Carbon Dioxide	1.68e-001	4.47e+002
Nitrogen	2.31e-001	3.91e+002
Methane	8.18e+001	7.93e+004
Ethane	1.26e+001	2.29e+004
Propane	3.40e+000	9.07e+003
Isobutane	4.47e-001	1.57e+003
n-Butane	7.23e-001	2.54e+003
Isopentane	1.93e-001	8.43e+002
n-Pentane	1.61e-001	7.04e+002
n-Hexane	4.61e-002	2.40e+002
Cyclohexane	4.70e-003	2.39e+001
Other Hexanes	1.08e-001	5.63e+002
Heptanes	4.04e-002	2.45e+002
Methylcyclohexane	9.09e-003	5.40e+001
2,2,4-Trimethylpentane	7.99e-004	5.52e+000
Benzene	9.99e-004	4.72e+000
Toluene	9.99e-004	5.57e+000
Ethylbenzene	9.99e-005	6.42e-001
Xylenes	2.50e-003	1.60e+001
C8+ Heavies	1.25e-002	1.29e+002

Total Components	100.00	1.19e+005

DRY GAS STREAM

Temperature: 80.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 2.29e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.57e-003	2.79e+000
Carbon Dioxide	1.67e-001	4.45e+002
Nitrogen	2.31e-001	3.91e+002
Methane	8.18e+001	7.93e+004
Ethane	1.26e+001	2.29e+004
Propane	3.40e+000	9.06e+003
Isobutane	4.47e-001	1.57e+003
n-Butane	7.22e-001	2.53e+003
Isopentane	1.93e-001	8.41e+002
n-Pentane	1.61e-001	7.02e+002
n-Hexane	4.59e-002	2.39e+002
Cyclohexane	4.60e-003	2.34e+001
Other Hexanes	1.08e-001	5.61e+002
Heptanes	4.01e-002	2.43e+002
Methylcyclohexane	8.91e-003	5.28e+001
2,2,4-Trimethylpentane	7.98e-004	5.50e+000
Benzene	8.11e-004	3.83e+000
Toluene	7.49e-004	4.17e+000
Ethylbenzene	7.06e-005	4.53e-001
Xylenes	1.55e-003	9.92e+000
C8+ Heavies	1.24e-002	1.27e+002
Total Components	100.00	1.19e+005

LEAN GLYCOL STREAM

Temperature: 80.00 deg. F
Flow Rate: 1.50e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	8.32e+003
Water	1.50e+000	1.27e+002
Carbon Dioxide	2.35e-012	1.98e-010
Nitrogen	1.68e-013	1.42e-011
Methane	9.62e-018	8.12e-016
Ethane	1.17e-007	9.89e-006
Propane	5.82e-009	4.92e-007
Isobutane	9.90e-010	8.36e-008
n-Butane	1.74e-009	1.47e-007
Isopentane	1.11e-004	9.36e-003
n-Pentane	1.21e-004	1.02e-002
n-Hexane	6.36e-005	5.37e-003
Cyclohexane	1.98e-004	1.67e-002
Other Hexanes	2.30e-004	1.94e-002
Heptanes	1.13e-004	9.56e-003

Methylcyclohexane	5.74e-004	4.85e-002
2,2,4-Trimethylpentane	3.10e-006	2.62e-004
Benzene	5.56e-004	4.69e-002
Toluene	1.42e-003	1.19e-001
Ethylbenzene	2.58e-004	2.18e-002
Xylenes	1.06e-002	8.98e-001
C8+ Heavies	2.47e-003	2.09e-001
Total Components	100.00	8.44e+003

RICH GLYCOL STREAM

Temperature: 80.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 1.53e+001 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.67e+001	8.31e+003
Water	2.30e+000	1.98e+002
Carbon Dioxide	2.30e-002	1.98e+000
Nitrogen	1.66e-003	1.43e-001
Methane	2.81e-001	2.42e+001
Ethane	2.44e-001	2.10e+001
Propane	1.40e-001	1.21e+001
Isobutane	3.24e-002	2.79e+000
n-Butane	6.91e-002	5.94e+000
Isopentane	2.18e-002	1.87e+000
n-Pentane	2.37e-002	2.04e+000
n-Hexane	1.25e-002	1.07e+000
Cyclohexane	6.06e-003	5.21e-001
Other Hexanes	2.26e-002	1.94e+000
Heptanes	2.22e-002	1.91e+000
Methylcyclohexane	1.41e-002	1.21e+000
2,2,4-Trimethylpentane	2.03e-004	1.74e-002
Benzene	1.09e-002	9.40e-001
Toluene	1.76e-002	1.52e+000
Ethylbenzene	2.45e-003	2.11e-001
Xylenes	8.17e-002	7.03e+000
C8+ Heavies	2.04e-002	1.75e+000
Total Components	100.00	8.60e+003

FLASH TANK OFF GAS STREAM

Temperature: 80.00 deg. F
Pressure: 74.70 psia
Flow Rate: 8.46e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.42e-002	1.37e-002
Carbon Dioxide	9.37e-001	9.20e-001
Nitrogen	2.14e-001	1.34e-001
Methane	6.34e+001	2.27e+001
Ethane	2.43e+001	1.63e+001
Propane	7.32e+000	7.20e+000

Isobutane	9.92e-001	1.29e+000
n-Butane	1.75e+000	2.27e+000
Isopentane	3.80e-001	6.11e-001
n-Pentane	3.41e-001	5.49e-001
n-Hexane	8.42e-002	1.62e-001
Cyclohexane	1.10e-002	2.06e-002
Other Hexanes	1.98e-001	3.81e-001
Heptanes	5.92e-002	1.32e-001
Methylcyclohexane	1.54e-002	3.37e-002
2,2,4-Trimethylpentane	9.34e-004	2.38e-003
Benzene	2.42e-003	4.21e-003
Toluene	1.80e-003	3.69e-003
Ethylbenzene	1.07e-004	2.52e-004
Xylenes	2.30e-003	5.45e-003
C8+ Heavies	3.79e-003	1.44e-002
Total Components	100.00	5.27e+001

FLASH TANK GLYCOL STREAM

Temperature: 80.00 deg. F
Flow Rate: 1.52e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.72e+001	8.31e+003
Water	2.32e+000	1.98e+002
Carbon Dioxide	1.24e-002	1.06e+000
Nitrogen	1.03e-004	8.77e-003
Methane	1.78e-002	1.52e+000
Ethane	5.48e-002	4.69e+000
Propane	5.71e-002	4.88e+000
Isobutane	1.76e-002	1.50e+000
n-Butane	4.30e-002	3.68e+000
Isopentane	1.47e-002	1.26e+000
n-Pentane	1.74e-002	1.49e+000
n-Hexane	1.07e-002	9.13e-001
Cyclohexane	5.85e-003	5.01e-001
Other Hexanes	1.83e-002	1.56e+000
Heptanes	2.08e-002	1.78e+000
Methylcyclohexane	1.38e-002	1.18e+000
2,2,4-Trimethylpentane	1.76e-004	1.51e-002
Benzene	1.09e-002	9.36e-001
Toluene	1.77e-002	1.51e+000
Ethylbenzene	2.46e-003	2.10e-001
Xylenes	8.21e-002	7.02e+000
C8+ Heavies	2.03e-002	1.74e+000
Total Components	100.00	8.55e+003

FLASH GAS EMISSIONS

Flow Rate: 3.35e+003 scfh
Control Method: Combustion Device
Control Efficiency: 98.00

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

Water	6.18e+001	9.83e+001
Carbon Dioxide	3.76e+001	1.46e+002
Nitrogen	5.41e-002	1.34e-001
Methane	3.20e-001	4.53e-001
Ethane	1.23e-001	3.26e-001
Propane	3.70e-002	1.44e-001
Isobutane	5.01e-003	2.57e-002
n-Butane	8.84e-003	4.53e-002
Isopentane	1.92e-003	1.22e-002
n-Pentane	1.72e-003	1.10e-002
n-Hexane	4.26e-004	3.24e-003
Cyclohexane	5.54e-005	4.11e-004
Other Hexanes	1.00e-003	7.63e-003
Heptanes	2.99e-004	2.64e-003
Methylcyclohexane	7.79e-005	6.75e-004
2,2,4-Trimethylpentane	4.72e-006	4.76e-005
Benzene	1.22e-005	8.42e-005
Toluene	9.08e-006	7.38e-005
Ethylbenzene	5.39e-007	5.05e-006
Xylenes	1.16e-005	1.09e-004
C8+ Heavies	1.92e-005	2.88e-004
Total Components	100.00	2.45e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.76e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	8.55e+001	7.14e+001
Carbon Dioxide	5.21e-001	1.06e+000
Nitrogen	6.76e-003	8.77e-003
Methane	2.05e+000	1.52e+000
Ethane	3.36e+000	4.69e+000
Propane	2.39e+000	4.88e+000
Isobutane	5.58e-001	1.50e+000
n-Butane	1.37e+000	3.68e+000
Isopentane	3.74e-001	1.25e+000
n-Pentane	4.43e-001	1.48e+000
n-Hexane	2.27e-001	9.08e-001
Cyclohexane	1.24e-001	4.84e-001
Other Hexanes	3.87e-001	1.54e+000
Heptanes	3.81e-001	1.77e+000
Methylcyclohexane	2.48e-001	1.13e+000
2,2,4-Trimethylpentane	2.80e-003	1.48e-002
Benzene	2.46e-001	8.89e-001
Toluene	3.27e-001	1.39e+000
Ethylbenzene	3.84e-002	1.89e-001
Xylenes	1.24e+000	6.12e+000
C8+ Heavies	1.94e-001	1.53e+000
Total Components	100.00	1.07e+002

CONDENSER PRODUCED WATER STREAM

Temperature: 120.00 deg. F
Flow Rate: 1.40e-001 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	1.00e+002	7.00e+001	999657.
Carbon Dioxide	3.26e-003	2.28e-003	33.
Nitrogen	7.04e-007	4.93e-007	0.
Methane	2.36e-004	1.65e-004	2.
Ethane	8.23e-004	5.76e-004	8.
Propane	8.72e-004	6.10e-004	9.
Isobutane	1.44e-004	1.01e-004	1.
n-Butane	4.64e-004	3.25e-004	5.
Isopentane	1.07e-004	7.48e-005	1.
n-Pentane	1.32e-004	9.24e-005	1.
n-Hexane	5.92e-005	4.15e-005	1.
Cyclohexane	1.66e-004	1.16e-004	2.
Other Hexanes	8.59e-005	6.01e-005	1.
Heptanes	4.70e-005	3.29e-005	0.
Methylcyclohexane	1.44e-004	1.01e-004	1.
2,2,4-Trimethylpentane	2.66e-007	1.86e-007	0.
Benzene	7.93e-003	5.55e-003	79.
Toluene	6.34e-003	4.44e-003	63.
Ethylbenzene	3.50e-004	2.45e-004	3.
Xylenes	1.32e-002	9.22e-003	132.
C8+ Heavies	1.95e-007	1.37e-007	0.
Total Components	100.00	7.00e+001	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 120.00 deg. F
Flow Rate: 2.33e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	4.03e-002	3.99e-003
Carbon Dioxide	1.36e-002	1.34e-003
Nitrogen	4.99e-005	4.94e-006
Methane	7.61e-003	7.53e-004
Ethane	1.14e-001	1.13e-002
Propane	5.96e-001	5.90e-002
Isobutane	3.62e-001	3.58e-002
n-Butane	1.18e+000	1.17e-001
Isopentane	8.90e-001	8.81e-002
n-Pentane	1.46e+000	1.44e-001
n-Hexane	1.84e+000	1.83e-001
Cyclohexane	1.26e+000	1.24e-001
Other Hexanes	2.42e+000	2.40e-001
Heptanes	7.37e+000	7.30e-001
Methylcyclohexane	4.81e+000	4.76e-001
2,2,4-Trimethylpentane	6.05e-002	5.99e-003
Benzene	2.78e+000	2.75e-001
Toluene	8.06e+000	7.98e-001
Ethylbenzene	1.47e+000	1.45e-001
Xylenes	4.99e+001	4.94e+000

C8+ Heavies	1.54e+001	1.52e+000
Total Components	100.00	9.89e+000

CONDENSER VENT STREAM

Temperature: 120.00 deg. F
Pressure: 14.80 psia
Flow Rate: 2.47e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.15e+001	1.35e+000
Carbon Dioxide	3.70e+000	1.06e+000
Nitrogen	4.81e-002	8.76e-003
Methane	1.46e+001	1.52e+000
Ethane	2.39e+001	4.67e+000
Propane	1.68e+001	4.82e+000
Isobutane	3.88e+000	1.47e+000
n-Butane	9.41e+000	3.56e+000
Isopentane	2.48e+000	1.16e+000
n-Pentane	2.85e+000	1.34e+000
n-Hexane	1.29e+000	7.25e-001
Cyclohexane	6.57e-001	3.60e-001
Other Hexanes	2.33e+000	1.30e+000
Heptanes	1.60e+000	1.04e+000
Methylcyclohexane	1.02e+000	6.53e-001
2,2,4-Trimethylpentane	1.19e-002	8.81e-003
Benzene	1.20e+000	6.08e-001
Toluene	9.88e-001	5.92e-001
Ethylbenzene	6.29e-002	4.34e-002
Xylenes	1.70e+000	1.18e+000
C8+ Heavies	6.21e-003	6.88e-003
Total Components	100.00	2.75e+001

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia

The calculated flow rate is less than 0.000001 #mol/hr.
The stream flow rate and composition are not reported.

****** End of Application for 45CSR30 Title V Operating Permit ******