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

Title V Pre-Draft Permit; Appalachia Midstream, L.L.C.; Application No. R30-06900143-2024

Steeber, Jeff <Jeff.Steeber@williams.com> Thu, Mar 21, 2024 at 8:27 AM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Looks Good, no further comments.

Thank you!

[Quoted text hidden]

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

Title V Pre-Draft Permit; Appalachia Midstream, L.L.C.; Application No. R30-06900143-2024

Barron, Sarah K <sarah.k.barron@wv.gov> Thu, Mar 21, 2024 at 7:58 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Jeff,

Thanks for speaking with me yesterday. The monitoring and recordkeeping requirements to demonstrate compliance with Condition 7.1.3.c. have been revised to the following:

Condition 7.2.3. To demonstrate compliance with the requirement to operate the thermal oxidizer according to the manufacturer's specifications of Condition 7.1.3.c., the combustion chamber temperature shall be continuously monitored and recorded. Any deviations below the minimum combustion chamber temperature while in operation shall be reported in accordance with Condition 7.5.3. **[45CSR§30-5.1.c.]**

Condition 7.4.5. The permittee shall maintain records of the combustion chamber temperature monitored in Condition 7.2.3. **[45CSR§30-5.1.c.]**

Do you have any further comments or questions about the pre-draft permit?

Thanks,
- Sarah

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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
Manager	WILLIAMS MLP OPERATING, LLC ONE WILLIAMS CENTER-MD-47 TULSA, OK, 74172
Type	**Name/Address**

Annual Reports

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

2013
2012
2011
2010
Date filed

File Your Current Year Annual Report Online Here

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

Thursday, February 29, 2024 — 11:14 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, L.L.C.; Application No. R30-06900143-2024

Steeber, Jeff <Jeff.Steeber@williams.com> Tue, Mar 19, 2024 at 2:50 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

Yes – Condition 6.1.3.c states *the thermal oxidizer shall be operated according to the manufacturer's specifications for residence time and minimum combustion chamber temperature*; however, the construction permit does not require monitoring of the operating temperature or residence time.

Secondly, for residence time –The residence time of 1 second is considered based on the design basis stipulated in the application – this is a calculated value not a measured value.

Per Zeeco: *"Waste gas or waste liquid incineration requires that the incoming waste be treated (1) at a high temperature (typically 1200 to 2000°F), (2) for a minimum residence time (typically 0.5 to 2.0 seconds) and (3) in an environment to ensure proper turbulent mixing of fuel, air, and waste. To meet these requirements, a steel vessel lined with high-temperature refractory is provided. The vessel size and refractory materials are selected to be compatible with the waste stream and to meet the basic time, temperature, and turbulence requirements."*

[Quoted text hidden]

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

Title V Pre-Draft Permit; Appalachia Midstream, L.L.C.; Application No. R30-06900143-2024

Barron, Sarah K <sarah.k.barron@wv.gov> Tue, Mar 19, 2024 at 10:40 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Jeff,

Have you had a chance to review the Pioneer Compressor Station's pre-draft permit and fact sheet?

- Sarah

[Quoted text hidden]

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

Title V Pre-Draft Permit; Appalachia Midstream, L.L.C.; Application No. R30-06900143-2024

Barron, Sarah K <sarah.k.barron@wv.gov> Wed, Mar 13, 2024 at 7:55 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Jeff,

Sorry for the delayed reply, I was out of the office the last few days. The draft/proposed permit has not yet been sent out for the EPA and public comment periods. However, in order to make sure the permit is issued on time, I'd like to have everything ready to be sent out by early next week. If possible, please send me any comments or questions that you have by tomorrow, March 14, 2024. If you have any further comments after the notice for the comment periods has been printed, then you will also have the opportunity to submit comments during the 30-day public comment period.

Thanks,
- Sarah

[Quoted text hidden]

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

Title V Pre-Draft Permit; Appalachia Midstream, L.L.C.; Application No. R30-06900143-2024

Steeber, Jeff <Jeff.Steeber@williams.com> Fri, Mar 8, 2024 at 9:54 AM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

Apologies I've been out of the office – I assume the deadline has passed for any questions/comments?

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Thursday, February 29, 2024 5:40 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: [EXTERNAL] Title V Pre-Draft Permit; Appalachia Midstream, L.L.C.; Application No. R30-06900143-2024

[Quoted text hidden]

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

Title V Pre-Draft Permit; Appalachia Midstream, L.L.C.; Application No. R30-06900143-2024

Barron, Sarah K <sarah.k.barron@wv.gov> Thu, Feb 29, 2024 at 5:39 PM
To: Jeff.Steeber@williams.com

Jeff,

Attached are the Pioneer Compressor Station's Pre-Draft Permit and Fact Sheet for you to review.

One other change that I wanted to let you know about is in the recordkeeping requirement of Condition 7.4.2. of the pre-draft permit. The requirement is from Condition 6.4.2. of R13-3491B which requires records of GRI-GLYCalc emission estimates to be maintained, but I also included "ProMax emission estimates" since the NSR permit allows the use of ProMax as an alternative to GRI-GLYCalc.

Please let me know if you have any comments or questions about either document as soon as practicable but preferably no later than Wednesday, March 6.

Thanks,
- Sarah

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

2 attachments

DPFactSheet R30-06900143-2024.pdf
499K

DPPermit R30-06900143-2024.pdf
768K

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.
Pioneer Compressor Station
R30-06900143-2024

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: **R30-06900143-2024**
Permittee: **Appalachia Midstream Services, L.L.C.**
Facility Name: **Pioneer 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:	Wheeling, Ohio County, West Virginia
Facility Mailing Address:	300 Elysian Lane (a.k.a. Harvey's Road), Wheeling, WV 26003
Telephone Number:	(304) 843-3100
Type of Business Entity:	LLC
Facility Description:	The Pioneer Compressor Station receives up to 250 mmscfd of natural gas from local production wells. The natural gas is compressed and dehydrated for delivery to a gathering pipeline. The facility also receives raw filed condensate which is stabilized and then sent offsite via tank trucks.
SIC Codes:	1389
UTM Coordinates:	534.794 km Easting • 4,443.746 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
CE-01	1E	Compressor Engine 01 – CAT G3616LE A4 (4SLB)	2017	5,350 HP	OxCat-01
CE-02	2E	Compressor Engine 02 – CAT G3616LE A4 (4SLB)	2017	5,350 HP	OxCat-02
CE-03	3E	Compressor Engine 03 – CAT G3616LE A4 (4SLB)	2017	5,350 HP	OxCat-03
CE-04	4E	Compressor Engine 04 – CAT G3616LE A4 (4SLB)	2017	5,350 HP	OxCat-04
CRP	5E	Compressor Rod Packing (Comp-01 to -05)	2017	5 compressors	--
CBD	6E	Compressor Blowdown (Comp-01 to -05)	2017	5 compressors	FLR-01
STAB	25E	Condensate Stabilizer	2017	--	VRU-01 with FLR-01 backup
DFT-01	7E	Dehydrator 01 – Flash Tank	2017	125 mmscfd	TO-01
DSV-01	8E	Dehydrator 01 – Still Vent	2017	125 mmscfd	TO-01
RBV-01	12E	Dehydrator 01 – Reboiler	2017	2.00 mmBTU/hr	--
DFT-02	9E	Dehydrator 02 – Flash Tank	2017	125 mmscfd	TO-01
DSV-02	10E	Dehydrator 02 – Still Vent	2017	125 mmscfd	TO-01
RBV-02	13E	Dehydrator 02 – Reboiler	2017	2.00 mmBTU/hr	--
TK-01	15E	Storage Tank 01 – Stabilized Condensate	2017	400 bbl	VRU-01 with FLR-01 backup
TK-02	16E	Storage Tank 02 – Stabilized Condensate	2017	400 bbl	VRU-01 with FLR-01 backup
TK-03	17E	Storage Tank 03 – Stabilized Condensate	2017	400 bbl	VRU-01 with FLR-01 backup
TK-04	18E	Storage Tank 04 – Stabilized Condensate	2017	400 bbl	VRU-01 with FLR-01 backup
TK-05	19E	Storage Tank 05 – Stabilized Condensate	2017	400 bbl	VRU-01 with FLR-01 backup

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
TK-06	20E	Storage Tank 06 – Stabilized Condensate	2017	400 bbl	VRU-01 with FLR-01 backup
TK-07	21E	Storage Tank 07 – Produced Water	2017	400 bbl	VRU-01 with FLR-01 backup
TK-08	22E	Storage Tank 08 – Produced Water	2017	400 bbl	VRU-01 with FLR-01 backup
TLO	23E	Truck Load Out – Stabilized Condensate	2017	168,000 bbl/yr	VRU-01 with FLR-01 backup
		Truck Load Out – Produced Water		30,000 bbl/yr	
PIG	24E	Pigging Operations (3 Receivers, 1 Launcher)	2017	1,772 events/yr	FLR-01
Fugitive Emission Sources					
FUG-G	1F	Process Piping and Equipment Leaks – Gas	2017	4,981 Fittings	--
FUG-L	2F	Process Piping and Equipment Leaks – Light Oil	2017	2,271 Fittings	--
ECC	3F	Engine Crankcase Emissions	2017	--	--
Control Devices					
TO-01	11E	DFT/DSV Thermal Oxidizer (Combustion Only)	2017	10.00 mmBTU/hr	--
FLR-01	14E	CBD/PIG/STAB Elevated Flare (Combustion Only)	2017	8.00 mmBTU/hr	--
VRU-01	--	TK/TLO Vapor Recovery Unit (Electric Compressor)	2017	--	--

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
R13-3491B	June 01, 2022

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)(14)]**

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, R13-3491, 4.1.1.]

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, R13-3491, 4.1.2., 6.1.7., 8.1.2., and 10.1.6.]

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, R13-3491, 4.1.3.]

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., State-Enforceable Only]

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.

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)(14-15) 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.

[45CSR§30-5.1.c.2.A.; 45CSR13, R13-3491, 4.4.1.]

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.
[45CSR§30-5.1.c.2.B.; 45CSR13, R13-3491, 3.4.1.]

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 Maintenance of Air Pollution Control Equipment.** For all pollution control equipment listed in Section 1.0., the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.
[45CSR13, R13-3491, 4.4.2. and 8.3.2.]

3.4.5. **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, R13-3491, 4.4.3. and 8.3.3.]

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:	**US EPA:**
DEPAirQualityReports@wv.gov	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 Ohio 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 Pioneer 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 Pioneer Compressor Station per 40 C.F.R. §§60.40(a), 60.40Da(a), 60.40b(a), and 60.40c(a), respectively.

d. **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 Pioneer 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 Pioneer 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 no compression ignition reciprocating internal combustion engines are operated at the Pioneer 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 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* – Subpart OOOO does not apply to the facility because construction of the Pioneer Compressor Station began after the applicability date.

k. **40 C.F.R. Part 63 Subpart HHH** – *National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities* – The Pioneer 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 Pioneer Compressor Station is not subject to Subpart HHH.

l. **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 Pioneer Compressor Station is not a major source of hazardous air pollutants.

m. **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 Pioneer Compressor Station is not a major source of hazardous air pollutants.

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 (RBV-01 and RBV-02) operated at the Pioneer Compressor Station are not subject to Subpart JJJJJJ.

4.0 Compressor Engines [Emission Point IDs: 1E to 4E]

4.1. Limitations and Standards

4.1.1. Maximum emissions from each of the 5,350 HP natural gas fired reciprocating engines equipped with oxidation catalysts, Caterpillar G3616 (CE-01 to CE-04), shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tpy)
Nitrogen Oxides	4.72	20.66
Carbon Monoxide	2.48	10.87
Volatile Organic Compounds (including Formaldehyde)	4.31	18.87
Formaldehyde	0.42	1.86

Compliance with this condition is demonstrated through the emissions testing required by Condition 4.3.1.

[45CSR13, R13-3491, 5.1.1. and 5.3.1.]

4.1.2. Requirements for the Use of Catalytic Reduction Devices (OxCat-01 to -04):

a. Lean-burn natural gas engine(s) 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 Condition 4.1.1. 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.

b. 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.

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

[45CSR13, R13-3491, 5.1.2.]

4.1.3. The provisions of 40 C.F.R. Part 60 Subpart JJJJ are applicable to stationary spark ignition (SI) internal combustion engines (ICE) (CE-01 to CE-04) 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 01, 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).

[45CSR13, R13-3491, 11.1.1.; 45CSR16; 40 C.F.R. §§60.4230(a), (a)(4) and (a)(4)(i)]

4.1.4. The following emission standards from Table 1 to Subpart JJJJ of Part 60 apply to the compressor engines CE-01 to CE-04:

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	07/01/2010	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, R13-3491, 11.1.2.; 45CSR16; 40 C.F.R. §60.4233(e); Table 1 to Subpart JJJJ of Part 60]

4.1.5. The permittee shall operate and maintain the stationary SI ICE CE-01 to CE-04 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, R13-3491, 11.1.3.; 45CSR16; 40 C.F.R. §60.4234]

4.1.6. After July 01, 2009, owners and operators may not install stationary SI ICE with a maximum engine power of greater than or equal to 500 HP that do not meet the applicable requirements in 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 01, 2010.
[45CSR13, R13-3491, 11.2.1.; 45CSR16; 40 C.F.R. §60.4236(b)]

4.1.7. 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, R13-3491, 11.2.2.; 45CSR16; 40 C.F.R. §60.4236(e)]

4.1.8. The permittee may operate CE-01 to CE-04 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 permittee is 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)]

4.1.9. 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)]

4.1.10. The permittee must comply with the applicable operating limitations of 40 C.F.R. Part 63 Subpart ZZZZ upon startup of the affected source.
[45CSR13, R13-3491, 14.1.1.; 45CSR34; 40 C.F.R. §63.6595(a)(7)]

4.1.11. **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 for 40 C.F.R. §63.6590(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, R13-3491, 14.1.2.; 45CSR34; 40 C.F.R. §§63.6590(c) and (c)(1)]

4.2. Monitoring Requirements

4.2.1. Catalytic Oxidizer Control Devices (OxCat-01 to -04)

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, R13-3491, 5.2.1.]

4.2.2. For the stationary SI ICE CE-01 to CE-04, the permittee must demonstrate compliance with Condition 4.1.4. according to the following:

a. Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in 40 C.F.R. §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 a stationary SI ICE 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, R13-3491, 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 Condition 4.1.1. and 4.2.2.a.1., 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 and 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 40 C.F.R. §60.8(c). If the permittee's stationary SI ICE 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 40 C.F.R. §60.8(f). Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least 1 hour.

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

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

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

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

Where:

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

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

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

Where:

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

[45CSR13, R13-3491, 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 4.1.2., the permittee shall maintain records of maintenance performed on each engine.
[45CSR13, R13-3491, 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, R13-3491, 5.4.2.]

4.4.3. The permittee shall maintain a copy of the site-specific maintenance plan or the manufacturer maintenance plan.
[45CSR13, R13-3491, 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 operating permit.
[45CSR13, R13-3491, 5.4.4.]

4.4.5. The permittee must keep records of the information in paragraphs a. through c. 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. Documentation that the engines CE-01 to CE-04 meet the emission standards set forth in Condition 4.1.4.

[45CSR13, R13-3491, 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, R13-3491, 11.5.1.c.; 45CSR16; 40 C.F.R. §60.4245(c)]

4.5.2. The permittee must submit a copy of each performance test as conducted in Condition 4.3.1. 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, R13-3491, 11.5.1.c.; 45CSR16; 40 C.F.R. §60.4245(d)]

4.6. Compliance Plan

4.6.1. None.

5.0 Subpart OOOOa Requirements for the Reciprocating Compressors associated with CE-01 to CE-04 and VRU-01

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 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 40 C.F.R. Part 60 Subpart OOOOa.
[45CSR16; 40 C.F.R. §60.5370a(b)]

5.1.2. 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 section for each reciprocating compressor affected facility.

a. The permittee must replace the reciprocating compressor rod packing according to either paragraph a.1. or a.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 each 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 5.2.1.

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 reporting as required by Condition 5.5.1. and the recordkeeping as required by Condition 5.4.1.

[45CSR13, R13-3491, 12.1.1.; 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 of 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.

a. To achieve initial compliance with the standards for each reciprocating compressor affected facility, the permittee must comply with paragraphs a.1. through a.4. of this condition.

1. If complying with Condition 5.1.2.a.1. or Condition 5.1.2.a.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.

2. If complying with Condition 5.1.2.a.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).

3. The permittee must submit the initial annual report for each reciprocating compressor as required in Condition 5.5.1.a. and b.

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

[45CSR13, R13-3491, 12.2.1.; 45CSR16; 40 C.F.R. §§60.5410a and 60.5410a(c)]

5.2.2. For each reciprocating compressor affected facility complying with Condition 5.1.2.a.1. or Condition 5.1.2.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.

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 reports 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 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, R13-3491, 12.3.1.; 45CSR16; 40 C.F.R. §60.5415a(c)]

5.3. Testing Requirements

5.3.1. None.

5.4. Recordkeeping Requirements

5.4.1. The permittee must maintain the records identified as specified in 40 C.F.R. §60.7(f) and in this condition, as applicable. 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 a.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. 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 5.1.2.a.3.

3. Records of deviations in cases where the reciprocating compressor was not operated in compliance with the requirements specified in Condition 5.1.2., 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 (a)(2) for reciprocating compressors.

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

d. If the reciprocating compressors are subject to the bypass requirements of §60.5416a(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. §60.5416a(b), a record of the monitoring conducted in accordance with §60.5416a(b).

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

1. A copy of the assessment conducted according to §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, R13-3491, 12.4.3.; 45CSR16; 40 C.F.R. §§60.5420a(c), (c)(3), (c)(6) to (c)(9), and (c)(17)]

5.5. Reporting Requirements

5.5.1. The permittee must submit annual reports containing the information specified in paragraphs a., b., and d. of this condition, as applicable. 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 5.2.1. 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. 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, 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; and

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. The information specified below for each reciprocating compressor affected facility:

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. Records of deviations specified in Condition 5.4.1.a.3. that occurred during the reporting period, the date and time the deviation began, duration of the deviation, and a description of the deviation.

c. The permittee must submit reports to the EPA via the CEDRI. (CEDRI can be accessed through the EPA's CDX (https://cdx.epa.gov/).) The permittee must use the appropriate electronic report in CEDRI for Subpart OOOOa or an alternate electronic file format consistent with the extensible markup language (XML) schema listed on the CEDRI Web site (https://www3.epa.gov/ttn/chief/cedri). If the reporting form specific to Subpart OOOOa is not available in CEDRI at the time that the report is due, the permittee must submit the report to the Administrator at the appropriate address listed in 40 C.F.R §60.4. Once the form has been available in CEDRI for at least 90 calendar days, the permittee must begin submitting all subsequent reports via CEDRI. The reports must be submitted by the deadlines specified in Subpart OOOOa, regardless of the method in which the reports are submitted.

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

[45CSR13, R13-3491, 12.4.2. and 12.4.3.; 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 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 40 C.F.R. Part 60 Subpart OOOOa.
[45CSR16; 40 C.F.R. §60.5370a(b)]

6.1.2. **Methane Standards.** For each affected facility under 40 C.F.R. §60.5365a(j), the permittee must reduce GHG emissions (in the form of a limitation on emissions of methane) by complying with the requirements of paragraphs a. through j. of this condition. These requirements are independent of the closed vent system and cover requirements in 40 C.F.R. §60.5411a.

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).

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 ii. of this condition. For the purposes of complying with the fugitive emissions monitoring program using Method 21, 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.

d. Each fugitive emissions monitoring plan must include the elements specified in paragraphs d.1. through 4. of this condition, at a minimum, as applicable.

1. Sitemap.

2. A defined observation path that ensures that all fugitive emissions components are within sight of the path. The observation path must account for interferences.

3. If using Method 21, 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.).

4. 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 60 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 60 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 within a company-defined area 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 or replaced in accordance with paragraphs h.1. and 2. of this condition. For fugitive emissions components also subject to the repair provisions of 40 C.F.R. §§60.5416a(b)(9) through (12) and (c)(4) through (7), those provisions apply instead to those closed vent system and covers, and the repair provisions of paragraphs h.1. and 2. of this condition do not apply to those closed vent systems and covers.

1. Each identified source of fugitive emissions shall be repaired or replaced as soon as practicable, but no later than 30 calendar days after detection of the fugitive emissions.

2. If the repair or replacement 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 or replacement must be completed during the next scheduled compressor station shutdown, after a planned vent blowdown, or within 2 years, whichever is earliest.

3. Each repaired or replaced fugitive emissions component must be resurveyed as soon as practicable, but no later than 30 days after being repaired, to ensure that there are no fugitive emissions.

i. For repairs that cannot be made during the monitoring survey when the fugitive emissions are initially found, the operator may resurvey the repaired fugitive emissions components using either Method 21 or optical gas imaging within 30 days of finding such fugitive emissions.

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 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).

iii. Operators that use Method 21 to resurvey the repaired fugitive emissions components are subject to the resurvey provisions specified in paragraphs h.3.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 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.

iv. Operators that use optical gas imaging to resurvey the repaired fugitive emissions components, are subject to the resurvey provisions specified in paragraphs h.3.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, R13-3491, 13.1.1.; 45CSR16; 40 C.F.R. §§60.5397a(a) through (e), (f)(2), (g), (g)(2) through (4), and (h) through (j)]

6.1.3. **VOC Standards.** For each affected facility under 40 C.F.R. §60.5365a(j), the permittee must reduce VOC emissions by complying with the requirements of paragraphs a. through j. of this condition. These requirements are independent of the closed vent system and cover requirements in 40 C.F.R. §60.5411a.

a. The permittee must monitor all fugitive emission 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 section, 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 emission 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, 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, 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, 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 d.1. through 3. of this condition, at a minimum, as applicable.

1. If the permittee is using optical gas imaging, the monitoring 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 the permittee is using Method 21, the monitoring plan must include a list of fugitive emissions components to be monitored and 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 paragraph 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 semiannually after the initial survey. Consecutive semiannual monitoring surveys must be conducted at least 4 months apart and no more than 7 months 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 or replaced 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. 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 compressor station shutdown for maintenance, after a scheduled vent blowdown, or within 2 years, whichever is earliest. For purposes of this paragraph, a vent blowdown is the opening of one or more blowdown valves to depressurize major production and processing equipment, other than a storage vessel.

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 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 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 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.

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 6.4.2.

j. Annual reports shall be submitted for each collection of fugitive emissions components at a compressor station that include the information specified in Condition 6.5.2.b. Multiple collection of fugitive emissions components at a compressor station may be included in a single annual report.

[45CSR13, R13-3491, 13.1.1.; 45CSR16; 40 C.F.R. §§60.5397a(a), (a)(1), (b) through (e), (f)(2), (g), (g)(2) through (4), and (h) through (j)]

6.2. Monitoring Requirements

6.2.1. The permittee must demonstrate 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 40 C.F.R. §§60.5397a(b), (c), and (d).

b. The permittee must conduct an initial monitoring survey as required in 40 C.F.R. §60.5397a(f).

c. The permittee must maintain the records specified in 40 C.F.R. §60.5420a(c)(15).

d. The permittee must repair each identified source of fugitive emissions for each affected facility as required in 40 C.F.R. §60.5397a(h).

e. The permittee must submit the initial annual report for each collection of fugitive emissions components at a compressor station as required in 40 C.F.R. §§60.5420a(b)(1) and (7).

[45CSR13, R13-3491, 13.2.1. and 13.2.2.; 45CSR16; 40 C.F.R. §§60.5410a and 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 40 C.F.R. §60.5397a according to paragraphs a. through d. of this condition.

a. The permittee must conduct periodic monitoring surveys as required in 40 C.F.R. §60.5397a(g).

b. The permittee must repair or replace each identified source of fugitive emissions as required in 40 C.F.R. §60.5397a(h).

c. The permittee must maintain records as specified in 40 C.F.R. §60.5420a(c)(15).

d. The permittee must submit annual reports for collection of fugitive emissions components at a compressor station as required in 40 C.F.R. §§60.5420a(b)(1) and (7).

[45CSR13, R13-3491, 13.3.1.; 45CSR16; 40 C.F.R. §60.5415a(h)]

6.3. Testing Requirements

6.3.1. None.

6.4. Recordkeeping Requirements

6.4.1. **Recordkeeping Requirements for Methane Standards.** 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 fugitive emissions monitoring plan as required in paragraphs b. through d. of Condition 6.1.2.

b. 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) performing the survey. The permittee must note the training and experience of the operator.

4. Monitoring instrument used.

5. When optical gas imaging is used to perform the survey, one or more digital photographs or videos, captured from the optical gas imaging instrument used for conduct of monitoring, of each required monitoring survey being performed. The digital photograph must include the date the photograph was taken and the latitude and longitude of the collection of fugitive emissions components at a compressor station imbedded within or stored with the digital file. As an alternative to imbedded latitude and longitude within the digital file, the digital photograph or video may consist of an image of the monitoring survey being performed with a separately operating GPS device within the same digital picture or video, provided the latitude and longitude output of the GPS unit can be clearly read in the digital image.

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

7. Ambient temperature, sky conditions, and maximum wind speed at the time of the survey.

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

9. Documentation of each fugitive emission, including the information specified in paragraphs b.9.i. through xii. of this condition.

    i. Location.

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

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

    iv. Number and type of difficult-to-monitor and unsafe-to-monitor fugitive emissions components monitored.

    v. Instrument reading of each fugitive emissions component that requires repair when Method 21 is used for monitoring.

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

    vii. Number and type of components that were tagged as a result of not being repaired during the monitoring survey when the fugitive emissions were initially found as required in paragraph h.3.ii. of Condition 6.1.2.

    viii. If a fugitive emissions component is not tagged, a digital photograph or video of each fugitive emissions component that could not be repaired during the monitoring survey when the fugitive emissions were initially found as required in paragraph h.3.ii. of Condition 6.1.2. The digital photograph or video must clearly identify the location of the component that must be repaired.

Any digital photograph or video required under this paragraph can also be used to meet the requirements under paragraph b.5. of this condition, as long as the photograph or video is taken with the optical gas imaging instrument, includes the date and the latitude and longitude are either imbedded or visible in the picture.

ix. Repair methods applied in each attempt to repair the fugitive emissions components.

x. Number and type of fugitive emissions components placed on delay of repair and explanation for each delay of repair.

xi. The date of successful repair of the fugitive emissions component.

xii. Instrumentation used to resurvey a repaired fugitive emissions component that could not be repaired during the initial fugitive emissions finding.

[45CSR13, R13-3491, 13.4.3.; 45CSR16; 40 C.F.R. §§60.5420a(c), (c)(15), and (c)(15)(i) to (ii)]

6.4.2. **Recordkeeping Requirements for VOC Standards.** 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 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 6.1.3.

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

[45CSR13, R13-3491, 13.4.3.; 45CSR16; 40 C.F.R. §§60.5420a(c), (c)(15), (c)(15)(i), (c)(15)(vi), and (c)(15)(vii)]

6.5. Reporting Requirements

6.5.1. **Reporting Requirements for Methane Standards.** 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; and

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 within the company-defined area, the records of each monitoring survey including the information specified in paragraphs b.1. through 12. of this condition.

1. Date of the survey.

2. Beginning and end time of the survey.

3. Name of operator(s) performing the survey. If the survey is performed by optical gas imaging, the permittee must note the training and experience of the operator.

4. Ambient temperature, sky conditions, and maximum wind speed at the time of the survey.

5. Monitoring instrument used.

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

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

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

9. Number and type of difficult-to-monitor and unsafe-to-monitor fugitive emissions components monitored.

10. The date of successful repair of the fugitive emissions component.

11. Number and type of fugitive emissions components placed on delay of repair and explanation for each delay of repair.

12. Type of instrument used to resurvey a repaired fugitive emissions component that could not be repaired during the initial fugitive emissions finding.

c. The permittee must submit reports to the EPA via the CEDRI. (CEDRI can be accessed through the EPA's CDX (https://cdx.epa.gov/).) The permittee must use the appropriate electronic report in CEDRI for 40 C.F.R. Part 60 Subpart OOOOa or an alternate electronic file format consistent with the extensible markup language (XML) schema listed on the CEDRI web site (https://www3.epa.gov/ttn/chief/cedri).

[45CSR13, R13-3491, 13.4.2.; 45CSR16; 40 C.F.R. §§60.5420a(b), (b)(1), (b)(7), and (b)(11)]

6.5.2. **Reporting Requirements for VOC Standards.** 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 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 required as specified in 40 C.F.R. §60.5420a(b). 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; and

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 below:

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 below:

i. Date of the survey.

ii. Monitoring instrument used.

iii. Any deviations from the monitoring plan elements under paragraphs c.1., 2., 7., and 8.i. of Condition 6.1.3. 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 6.1.3.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.

c. The permittee must submit reports to the EPA via the CEDRI. (CEDRI can be accessed through the EPA's CDX (*https://cdx.epa.gov/*).) The permittee must use the appropriate electronic report in CEDRI for 40 C.F.R. Part 60 Subpart OOOOa or an alternate electronic file format consistent with the extensible markup language (XML) schema listed on the CEDRI web site (https://www3.epa.gov/ttn/chief/cedri/).

[45CSR13, R13-3491, 13.4.2.; 45CSR16; 40 C.F.R. §§60.5420a(b), (b)(1), (b)(7), and (b)(11)]

6.6. Compliance Plan

6.6.1. None.

7.0 Natural Gas Dehydration Units [Emission Point IDs: 7E through 11E]

7.1. Limitations and Standards

7.1.1. **Maximum Throughput Limitation.** The maximum dry natural gas throughput to each of the glycol dehydration units/still columns (DFT-01, DSV-01, DFT-02, DSV-02) shall not exceed 125.0 million standard cubic feet per day (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, R13-3491, 6.1.1.]

7.1.2. The permittee shall install a 10.0 mmBTU/hr thermal oxidizer to control volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions from the glycol dehydration units/still vents and dehydrator flash tanks. This thermal oxidizer shall be designed to achieve a minimum guaranteed control efficiency of 99.5% for VOC and HAP emissions.
[45CSR13, R13-3491, 6.1.2.]

7.1.3. The thermal oxidizer (TO-01) shall be designed and operated in accordance with the following:

a. The vapors/overheads from the still vents (DSV-01, DSV-02) and flash tanks (DFT-01, DFT-02) shall be routed to the thermal oxidizer at all times;

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

c. The thermal oxidizer shall be operated according to the manufacturer's specifications for the residence time and the minimum combustion chamber temperature of 1,650°F;

d. The thermal oxidizer shall be operated at all times when emissions/overheads from the glycol dehydration unit still vents and flash tanks may be vented to it;

e. The thermal oxidizer 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 thermal oxidizer (TO-01) is subject to the applicable requirements of 45CSR6.

1. No person shall cause or allow particulate matter to be discharged from the thermal oxidizer TO-01 into the open air in excess of 1.81 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 (20%) opacity or greater.
[45CSR§6-4.3.]

3. The provisions of paragraph f.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.]**

[45CSR6; 45CSR13, R13-3491, 6.1.3.; 45CSR§30-5.1.c.]

7.1.4. Emissions from the thermal oxidizer shall not exceed the following maximum hourly and annual emission limits:

Pollutant	Maximum Hourly Emissions (lbs/hr)	Maximum Annual Emissions (tpy)
Nitrogen Oxides	0.98	4.29
Carbon Monoxide	3.10	13.58
Volatile Organic Compounds	1.31	5.80
Total HAPs	0.42	1.76

[45CSR13, R13-3491, 6.1.4.]

7.1.5. 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 and each year thereafter, using gas composition data measured during the preceding 12 months.
[45CSR13, R13-3491, 6.1.5.; 45CSR34; 40 C.F.R. §63.760(c)]

7.1.6. The permittee is exempt from the requirements of 40 C.F.R. §63.764(d) if the criteria listed in paragraph a. of this condition is met, except that records of the determination of the criteria must be maintained as required in Condition 7.4.4.

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 Condition 7.3.3.

[45CSR13, R13-3491, 6.1.6.; 45CSR34; 40 C.F.R. §§63.764(e), (e)(1), and (e)(1)(ii)]

7.1.7. 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 7.1.3.b. and 7.1.3.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, R13-3491, 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 (DSV-01, DSV-02).
[45CSR13, R13-3491, 6.2.2.]

7.2.3. To demonstrate compliance with the requirement to operate the thermal oxidizer according to the manufacturer's specifications of Condition 7.1.3.c., the combustion chamber temperature and residence time shall be continuously monitored and recorded. Any deviations below the minimum combustion chamber temperature while in operation shall be reported in accordance with Condition 7.5.3.
[45CSR§30-5.1.c.]

7.3. Testing Requirements

7.3.1. In order to demonstrate compliance with the opacity requirements of Condition 7.1.3.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. Part 60 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, R13-3491, 6.3.1.]

7.3.2. In order to demonstrate compliance with Condition 7.1.4., upon request of the Director, the permittee shall demonstrate compliance with the VOC and HAP emission 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, R13-3491, 6.3.2.]

7.3.3. **Determination of glycol dehydration 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, R13-3491, 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 caveats.

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, R13-3491, 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, R13-3491, 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 40 C.F.R. §63.7(f)(5)).
[45CSR13, R13-3491, 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.

[45CSR§§6-7.1. and -7.2.]

7.4. Recordkeeping Requirements

7.4.1. The permittee shall maintain a record of the dry natural gas throughput for the glycol dehydration units/still columns (DSV-01, DSV-02) to demonstrate compliance with Condition 7.1.1. of this permit. Said records shall be maintained for a period of five (5) years on-site or in a readily accessible off-site location maintained by the permittee. Said records shall be readily available to the Director 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, R13-3491, 6.4.1.]

7.4.2. For the purpose of documenting compliance with the emission limitations, the HAP major source thresholds, as well as the benzene exemption, the permittee shall maintain records of all monitoring data, wet gas sampling, and annual GRI-GLYCalc™ or ProMax emission estimates. Said records shall be maintained for a period of five (5) years on-site or in a readily accessible off-site location maintained by the permittee. 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 upon request by the Director shall be certified by a responsible official.
[45CSR13, R13-3491, 6.4.2.; 45CSR§30-5.1.c.]

7.4.3. The permittee shall maintain records of all monitoring data required by Condition 7.3.1. 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, R13-3491, 6.4.3.]

7.4.4. For a glycol dehydration unit that meets the exemption criteria in 40 C.F.R. §63.764(e)(1)(ii) (Condition 7.1.6. of this operating permit), the permittee shall maintain the records specified in paragraph a. of this condition for that glycol dehydration unit.

a. The actual average benzene emissions (in terms of benzene emissions per year) as determined in accordance with 40 C.F.R. §63.772(b)(2).

[45CSR34; 40 C.F.R. §§63.764(e), 63.774(d)(1) and (d)(1)(ii)]

7.4.5. The permittee shall maintain records of the combustion chamber temperature and residence time monitored in Condition 7.2.3.
[45CSR§30-5.1.c.]

7.4.6. The permittee shall maintain a copy of the manufacturer's operation and maintenance specifications on-site.
[45CSR§30-5.1.c.]

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 withing sixty (60) days of testing and provide all supporting calculations and testing data.
[45CSR13, R13-3491, 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, R13-3491, 6.5.2.]

7.5.3. Any deviation(s) from the thermal oxidizer design and/or operation criteria in Condition 7.1.3. shall be reported in writing to the Director as soon as practicable, but within ten (10) calendar days.
[45CSR13, R13-3491, 6.5.3.]

7.5.4. The TEG dehydration units are located at an area source and each 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 Dehydration Unit Reboilers [Emission Point IDs: 12E and 13E]

8.1. Limitations and Standards

8.1.1. Maximum Design Heat Input. The maximum design heat input for each of the reboilers (RBV-01 and RBV-02) shall not exceed 2.00 mmBTU/hr.
[45CSR13, R13-3491, 7.1.1.]

8.1.2. 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.
[45CSR§2-3.1.; 45CSR13, R13-3491, 7.1.2.]

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 8.1.2. Method 9 shall be conducted in accordance with 40 C.F.R. Part 60 Appendix A.
[45CSR13, R13-3491, 7.2.1.]

8.3. Testing Requirements

8.3.1. Compliance with the visible emission requirements of Condition 8.1.2. 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 8.1.2. Continuous opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control.
[45CSR§2-3.2.; 45CSR13, R13-3491, 7.3.1.]

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, R13-3491, 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, R13-3491, 7.5.1.]

8.6. Compliance Plan

8.6.1. None.

9.0 Condensate Storage Tanks and Produced Water Storage Tanks [Emission Point ID: 15E to 22E]

9.1. Limitations and Standards

9.1.1. The permittee shall route all volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions from the Condensate Storage Tanks (TK-01 to TK-06) and the Produced Water Storage Tanks (TK-07 and TK-08) to the vapor recovery unit (VRU-01). The vapor recovery system shall be designed to achieve a minimum guaranteed control efficiency of 98% for VOC and HAP emissions. Emissions from the condensate storage tanks and produced water storage tanks will be collected and compressed by the VRU-01 whereby the vapors are sufficiently compressed to be introduced into the gas system to allow for compression and dehydration.
[45CSR13, R13-3491, 8.1.1.]

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

Storage Tank ID	Product Stored	Maximum Annual Throughput (gal/yr)
TK-01	Condensate	1,176,000
TK-02	Condensate	1,176,000
TK-03	Condensate	1,176,000
TK-04	Condensate	1,176,000
TK-05	Condensate	1,176,000
TK-06	Condensate	1,176,000
TK-07	Produced Water	630,000
TK-08	Produced Water	630,000

[45CSR13, R13-3491, 8.1.3.]

9.2. Monitoring Requirements

9.2.1. The permittee shall monitor the throughput to the storage tanks (TK-01 to TK-08) on a monthly basis.
[45CSR13, R13-3491, 8.2.1.]

9.2.2. To demonstrate compliance with Condition 9.1.1., the permittee shall monitor VRU-01 in accordance with the plans and specifications and manufacturer's recommendations.
[45CSR13, R13-3491, 8.2.2.]

9.3. Testing Requirements

9.3.1. None.

9.4. Recordkeeping Requirements

9.4.1. All records required under Section 9.4., as well as any record of maintenance of VRU-01 required by Condition 3.4.4. and any record of malfunction of VRU-01 required by Condition 3.4.5., shall be kept in accordance with Condition 3.4.2. of this operating permit.
[45CSR13, R13-3491, 8.3.1.]

9.4.2. To demonstrate compliance with Condition 9.1.2., the permittee shall maintain a record of the aggregate throughput for the storage tanks on a monthly and rolling twelve month total.
[45CSR13, R13-3491, 8.3.4.]

9.4.3. The permittee shall maintain a copy of all design records of the process, maintenance records of equipment and any downtime hours associated with the VRU-01.

a. The initial compliance requirements.

b. Each annual visual inspection conducted to demonstrate continuous compliance, including records of any repairs that were made as results of the inspection.

c. Bypass requirements.

1. Each occurrence that the control device was bypassed. If the device was bypassed, the records shall include the date, time, and duration of the event and shall provide the reason the event occurred. The record shall also include the estimate of emissions that were released to the environment as a result of the bypass.

d. Any part of the system that has been designated as “unsafe to inspect” or “difficult to inspect”.

[45CSR13, R13-3491, 8.3.5.]

9.5. Reporting Requirements

9.5.1. Upon request by the Director, the permittee shall report deviations within a requested time from any occurrences when the control device was operated outside of the parameters defined in the monitoring plan.
[45CSR13, R13-3491, 8.4.1.]

9.5.2. The permittee shall notify the Director of any downtime of the VRU-01 in excess of 2%, based on the 12-month rolling total, in writing to the Director of the Division of Air Quality as soon as practicable, but within ten (10) calendar days of the discovery and shall include, at a minimum, the following information: the dates and durations of each downtime event, the cause or suspected causes for each downtime event, any corrective measures taken or planned for each downtime event.
[45CSR13, R13-3491, 8.4.2.]

9.6. Compliance Plan

9.6.1. None.

10.0 Truck Loading [Emission Point ID: 23E]

10.1. Limitations and Standards

10.1.1. The permittee shall install, maintain, and operate all above-ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above-ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be replaced.
[45CSR13, R13-3491, 9.1.1.]

10.1.2. The maximum quantity of produced water from truck loading (TLO) that shall be loaded shall not exceed 1,260,000 gallons per year. 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, R13-3491, 9.1.2.]

10.1.3. The maximum quantity of condensate from truck loading (TLO) that shall be loaded shall not exceed 7,056,000 gallons per year. 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, R13-3491, 9.1.3.]

10.1.4. The Produced Water and Condensate Truck Loading (TLO) shall be operated in submerged filling and be controlled by a vapor recovery unit (VRU-01).
[45CSR13, R13-3491, 9.1.4.]

10.2. Monitoring Requirements

10.2.1. None.

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, R13-3491, 9.3.1.]

10.4.2. To demonstrate compliance with Conditions 10.1.2. and 10.1.3., the permittee shall maintain a record of the aggregate throughput for the truck loading (TLO) on a monthly and rolling twelve-month total.
[45CSR13, R13-3491, 9.3.2.]

10.5. Reporting Requirements

10.5.1. None.

10.6. Compliance Plan

10.6.1. None.

11.0 Compressor Blowdown, Pigging, and Condensate Stabilizer Operations controlled by Elevated Flare [Emission Point IDs: 6E, 24E, 25E, and 14E]

11.1. Limitations and Standards

11.1.1. The maximum number of compressor blowdown (CBD) events per year shall not exceed 422 events with an estimated 54,732 scf per event. 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, R13-3491, 10.1.1.]

11.1.2. The maximum number of pigging (PIG) events per year shall not exceed 1,042 low pressure events with an estimated 3,823 scf per event and 730 high pressure events with an estimated 8,064 scf per event. Compliance shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the low pressure and high pressure pigging events at any given time during the previous twelve consecutive calendar months.
[45CSR13, R13-3491, 10.1.2.]

11.1.3. The maximum number of plant shutdown events per year shall not exceed 1 event with an estimated 967,000 scf per event. Compliance shall be determined using a twelve-month rolling total. A twelve-month rolling total shall mean the sum of the plant shutdowns at any given time during the previous twelve consecutive calendar months. Unscheduled emergency shutdowns shall not be counted as plant shutdown events.
[45CSR13, R13-3491, 10.1.3.]

11.1.4. The waste gas from the compressor blowdowns (CBD) and pigging (PIG) shall be controlled at all times by the elevated flare (FLR-01). The flare shall have a design capacity of 8.0 mmBTU/hr. This flare shall be designed to achieve a minimum guaranteed control efficiency of 98% for volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions.
[45CSR13, R13-3491, 10.1.4.]

11.1.5. The maximum emissions from the elevated flare (FLR-01) shall not exceed the following limits:

Pollutant	Maximum Annual Emissions (tpy)
Nitrogen Oxides	3.44
Carbon Monoxide	10.86
Volatile Organic Compounds	6.18

[45CSR13, R13-3491, 10.1.5.]

11.1.6. The quantity of waste gas that shall be consumed in the flare (FLR-01) shall not exceed 50.19 mmscf per year. Compliance with the gas throughput limit shall be demonstrated using a rolling twelve-month total.
[45CSR13, R13-3491, 10.1.7.]

11.1.7. The flare (FLR-01) is subject to the following 45CSR6 requirements:

a. No person shall cause or allow particulate matter to be discharged from any incinerator into the open air in excess of 0.91 lbs/hr.

b. No person shall cause or allow emission of smoke into the atmosphere from any incinerator which is twenty percent (20%) opacity or greater.
[45CSR13, R13-3491, 10.1.8.]

c. The provisions of paragraph b. of this condition 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.

d. 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 into the open air.

e. Incinerators, including all associated equipment and grounds, shall be designed, operated and maintained so as to prevent the emission of objectionable odors.

[45CSR§§6-4.1. and -4.3. through -4.6.]

11.1.8. The flare (FLR-01) shall be operated with a pilot flame present at all times whenever emissions may be vented.
[45CSR13, R13-3491, 10.1.9.]

11.1.9. The flare (FLR-01) installed shall be operated and designed in accordance with the information filed in the permit application R13-3491.
[45CSR13, R13-3491, 10.1.10.]

11.1.10. The permittee shall route the stabilization overheads to VRU-01 at all times except for 120 hours per year for stabilizer overheads compressor downtime associated with planned preventative maintenance. During this planned compressor maintenance, the permittee shall direct the stabilization overheads to flare FLR-01.
[45CSR13, R13-3491, 10.1.12.]

11.2. Monitoring Requirements

11.2.1. In order to demonstrate compliance with the requirements of Condition 11.1.8., the permittee shall monitor the presence or absence of a flare pilot flame using a thermocouple or any other equivalent device.
[45CSR13, R13-3491, 10.2.1.]

11.2.2. In order to demonstrate compliance with the requirements of Condition 11.1.6., the permittee shall monitor the throughput to the flare (FLR-01) on a monthly basis.
[45CSR13, R13-3491, 10.2.2.]

11.3. Testing Requirements

11.3.1. 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 11.1.7.b. Method 9 shall be conducted in accordance with 40 C.F.R. Part 60 Appendix A.
[45CSR13, R13-3491, 10.3.1.]

11.3.2. 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.

[45CSR§§6-7.1. and -7.2.]

11.4. Recordkeeping Requirements

11.4.1. All records required under Section 11.4. of this permit shall be kept in accordance with Condition 3.4.2.
[45CSR13, R13-3491, 10.4.1.]

11.4.2. To demonstrate compliance with Condition 11.1.1. of this permit, the permittee shall maintain a record of the compressor blowdown events and estimated volume per event (scf) on a monthly and rolling twelve-month total.
[45CSR13, R13-3491, 10.4.2.]

11.4.3. To demonstrate compliance with Condition 11.1.2. of this permit, the permittee shall maintain a record of the low pressure and high pressure pigging events and estimated volume per event (scf) on a monthly and rolling twelve month total.
[45CSR13, R13-3491, 10.4.3.]

11.4.4. To demonstrate compliance with Condition 11.1.3. of this permit, the permittee shall maintain a record of the shutdown events and estimated volume per event (scf) on a monthly and rolling twelve-month total.
[45CSR13, R13-3491, 10.4.4.]

11.4.5. For the purpose of demonstrating compliance with Conditions 11.1.8. and 11.2.1., the permittee shall maintain records of the times and duration of all periods which the pilot flame was absent.
[45CSR13, R13-3491, 10.4.5.]

11.4.6. For the purpose of demonstrating compliance with the requirements set forth in Condition 11.1.7.b., the permittee shall maintain records of testing conducted in accordance with Condition 11.3.1.
[45CSR13, R13-3491, 10.4.6.]

11.4.7. The permittee shall document and maintain the corresponding records specified by the on-going monitoring requirements of Section 11.2. and the testing requirements of Section 11.3.
[45CSR13, R13-3491, 10.4.7.]

11.4.8. To demonstrate compliance with Condition 11.1.10., the permittee shall document and maintain records of the stabilizer overheads compressor downtime associated with planned preventative maintenance, specifically the hours that the stabilization overheads are routed to the flare FLR-01.
[45CSR13, R13-3491, 10.4.8.]

11.5. Reporting Requirements

11.5.1. If the permittee is required by the Director to demonstrate compliance with Condition 11.3.1., the permittee shall submit the testing results within sixty (60) days of testing and provide all supporting calculations and testing data.
[45CSR13, R13-3491, 10.5.1.]

11.5.2. Any deviation(s) from the allowable visible emissions requirement of Condition 11.1.7.b. for any emission source discovered during observations using 40 C.F.R. Part 60 Appendix A, Method 9 or 22 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, R13-3491, 10.5.2.]

11.5.3. Any deviation(s) from the flare design and operation criteria in Condition 11.1.9. and permit application R13-3491, shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but no later than ten (10) calendar days of discovery of such deviation.
[45CSR13, R13-3491, 10.5.3.]

11.5.4. The permittee shall report to the Director the time, cause of event, estimate of emissions, and corrective actions taken when the flare was used for an emergency at the facility.
[45CSR13, R13-3491, 10.5.4.]

11.5.5. Any time the air pollution control device is not operating when emissions are vented to it shall be reported in writing to the Director of the DAQ as soon as practicable, but within ten (10) calendar days of the discovery.
[45CSR13, R13-3491, 10.5.5.]

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: **R30-06900143-2024**
Application Received: **May 24, 2023**
Plant Identification Number: **03-54-06900143**
Permittee: **Appalachia Midstream Services, L.L.C.**
Facility Name: **Pioneer Compressor Station**
Mailing Address: **100 Teletech Drive, Suite 2, Moundsville, WV 26041**

Physical Location:	Wheeling, Ohio County, West Virginia
UTM Coordinates:	534.794 km Easting • 4,443.746 km Northing • Zone 17
Directions:	From West Liberty, WV, head west on Van Meter Way for approximately 1.0 mile. Turn left onto Weidman Run Road / Bethany Road, and travel for approximately 1.7 miles. Take a sharp right onto Elysian Lane (aka Harvey's Road). The destination is straight ahead in approximately 0.3 miles.

Facility Description
The Pioneer Compressor Station receives up to 250 mmscfd of natural gas from local production wells. The natural gas is compressed and dehydrated for delivery to a gathering pipeline. The facility also receives raw field condensate which is stabilized and then sent offsite via tanker trucks.
SIC: 1389, NAICS: 213112

Emissions Summary

Plantwide Emissions Summary [Tons per Year]

Regulated Pollutants	Potential Emissions	2022 Actual Emissions
Carbon Monoxide (CO)	70.87	13.15
Nitrogen Oxides (NO_X)	92.33	74.57
Particulate Matter ($PM_{2.5}$)	7.59	6.54
Particulate Matter (PM_{10})	7.59	6.54
Total Particulate Matter (TSP)	7.59	6.54
Sulfur Dioxide (SO_2)	0.46	0.37
Volatile Organic Compounds (VOC)	130.77	93.11

PM_{10} is a component of TSP.

Hazardous Air Pollutants	Potential Emissions	2022 Actual Emissions
Acetaldehyde	2.08	1.87
Acrolein	1.28	1.16
Benzene	0.31	None Reported
1,3-Butadiene	0.07	None Reported
Ethylbenzene	0.41	None Reported
Formaldehyde	7.56	4.80
n-Hexane	2.90	1.06
Methanol	0.85	0.32
Polycyclic Organic Matter (POM/PAH)	0.09	None Reported
Toluene	0.62	0.24
2,2,4-Trimethylpentane	0.26	None Reported
Xylenes	1.32	0.70
Other HAPs	0.08	None Reported
Total HAPs	17.83	10.15

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

Title V Program Applicability Basis

This facility has the potential to emit 130.77 tpy of VOCs. 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	Operating Permit Requirements.
	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 OOOOa	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced after September 18, 2015
	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 Combust 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
R13-3491B	June 01, 2022

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 Pioneer Compressor Station is an existing facility that was initially permitted under the General Permit G35-D127. The general permit was superseded by the NSR Permit R13-3491. With the issuance of the Class II Administrative Update Permit R13-3491B, the facility became subject to Title V due to a potential to emit over 100 tpy of volatile organic compounds (VOCs).

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	R13-3491B 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 Pioneer 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	4.1.1.
3.1.10.	Operation and Maintenance of Air Pollution Control Equipment.	45CSR13	4.1.2., 6.1.7., 8.1.2., and 10.1.6.
3.1.11.	Only the permitted emission units and de minimis sources are authorized at the facility.	45CSR13	4.1.3.
3.1.12.	Fugitive particulate matter may not be discharged beyond the boundary lines of the facility.	45CSR§17-3.1.	N/A

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-3491B Condition
3.4.1.	Record of Monitoring Information.	45CSR13 45CSR§30-5.1.c.2.A.	4.4.1.
3.4.2.	Retention of Records.	45CSR13 45CSR§30-5.1.c.2.B.	3.4.1.
3.4.4.	Record of Maintenance of Air Pollution Control Equipment.	45CSR13	4.4.2. and 8.3.2.
3.4.5.	Record of Malfunctions of Air Pollution Control Equipment.	45CSR13	4.4.3. and 8.3.3.
3.7.2.	Permit Shield. This condition contains the standards that are currently inapplicable to the facility and for which the permittee requested a permit shield. These determinations have also been included in the Non-Applicability Determinations section of this Fact Sheet.	45CSR§30-5.6.	N/A

Section 4.0. – Compressor Engines [Emission Point IDs: 1E to 4E]

The Pioneer Compressor Station operates four spark ignition (SI) reciprocating internal combustion engines (RICEs) (Emission Units: CE-01 to CE-04; Emission Point IDs: 1E to 4E). The RICEs are Caterpillar G3616LE-A4 engines, and each has a maximum power rating of 5,350 HP.

The engines are fueled by natural gas. Emissions of carbon monoxide (CO), volatile organic compounds (VOCs), and formaldehyde from the combustion of natural gas in each engine are controlled by an oxidation catalyst (OxCat-01 to -04).

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 the engines CE-01 to CE-04 commenced after July 12, 2006; the manufacture date of each engine is after July 01, 2007; and the maximum engine power of each is 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).

   CE-01 to CE-04 are non-emergency, 4-stroke lean burn (4SLB) engines. Therefore, the engines are subject to the emission standards for NO_X, CO, and VOCs per 40 C.F.R. §60.4233(e). The engines are non-certified under Subpart JJJJ. As the engines CE-01 to CE-04 are non-certified under Subpart JJJJ, compliance with the emission standards is demonstrated through periodic performance tests as specified in §60.4244 as well as 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), CE-01 to CE-04 are considered new stationary RICEs as construction of the engines commenced after June 12, 2006. As new stationary RICEs located at an area source of HAPs, these engines demonstrate compliance with the requirements of Subpart ZZZZ through compliance with the requirements of Part 60 Subpart JJJJ per 40 C.F.R. §§63.6590(c) and (c)(1).

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	R13-3491B Condition
4.1.1.	Emission limitations for NO_X, CO, VOCs, and Formaldehyde from the engines CE-01 to CE-04. Compliance with the limits is demonstrated by the testing requirements of Condition 4.3.1.	45CSR13	5.1.1. and 5.3.1.
4.1.2.	Requirements for the use of the catalytic reduction devices (OxCat-01 to -04).	45CSR13	5.1.2.
4.1.3.	Applicability of 40 C.F.R. Part 60 Subpart JJJJ to the engines CE-01 to CE-04.	45CSR13 45CSR16 40 C.F.R. §§60.4230(a), (a)(4), (a)(4)(i)	11.1.1.
4.1.4.	Emission Standards of Table 1 to Subpart JJJJ of Part 60 that apply to CE-01 to CE-04.	45CSR13 45CSR16 40 C.F.R. §60.4233(e) Table 1 to Subpart JJJJ of Part 60	11.1.2.
4.1.5.	CE-01 to CE-04 must be operated and maintained to achieve the emissions standards of 40 C.F.R. §60.4233(e) over the entire life of each engine.	45CSR13 45CSR16 40 C.F.R. §60.4234	11.1.3.
4.1.6.	Deadline for installing stationary ICE with a maximum engine power over 500 HP that do not meet the requirements of 40 C.F.R. §60.4233.	45CSR13 45CSR16 40 C.F.R. §60.4236(b)	11.2.1.
4.1.7.	The requirements of 40 C.F.R. §60.4236 do not apply to engines that are modified, reconstructed, or reinstalled at a new location.	45CSR13 45CSR16 40 C.F.R. §60.4236(e)	11.2.2.
4.1.8.	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
4.1.9.	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	R13-3491B Condition
4.1.10.	For a new or reconstructed RICE located at an area source, compliance with 40 C.F.R. Part 63 Subpart ZZZZ must be demonstrated upon startup. 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 40 C.F.R. §63.6595(a)(1). This requirement is inapplicable to the engines at the compressor station which are considered new RICE at an area source under Subpart ZZZZ and has been replaced with the requirement described above.	45CSR13 45CSR34 40 C.F.R. §63.6595(a)(7)	14.1.1.
4.1.11.	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)	14.1.2.
4.2.1.	Monitoring requirements for catalytic oxidizer control devices (OxCat-01 to -04).	45CSR13	5.2.1.
4.2.2.	Requirements for non-certified engines under Subpart JJJJ to demonstrate compliance with the emission standards of 40 C.F.R. §60.4233(e). 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.	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 4.1.2.	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.
4.4.4.	Maintain records of 4.4.1. through 4.4.3. in accordance with the requirements for the Retention of Records in Condition 3.4.2. of the operating permit.	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.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-3491B Condition
4.5.1.	Initial notification requirements for 40 C.F.R. Part 60 Subpart JJJJ.	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.c.*

* Condition 11.5.1. of R13-3491B contains two paragraphs labeled as "c."

NOTE: The following conditions of R13-3491B have not been included in this operating permit:

1. Condition 11.1.1.b. contains the applicability requirement of 40 C.F.R. §60.4230(a)(5) and applies to stationary SI ICEs that were modified or reconstructed after June 12, 2006. However, as construction of the engines CE-01 to CE-04 commenced after June 12, 2006, this requirement has not been included in the operating permit.

2. Conditions 11.3.1.a. and 11.5.1.a.3. – 11.3.1.a. contains the requirement of 40 C.F.R. §60.4243(b)(1), and 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 Pioneer Compressor Station are non-certified, these requirements are inapplicable.

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

Sections 5.0. and 6.0. contain the applicable requirements of 40 C.F.R. Part 60 Subpart OOOOa. Subpart OOOOa of the NSPS contains the standards for the control of VOC, SO_2, and Greenhouse Gas (GHG) emissions from crude oil and natural gas facilities. The Pioneer Compressor Station is located prior to the natural gas processing plant (the point of custody transfer to the natural gas transmission and storage segment) and is included in the natural gas production source category.

Subpart OOOOa applies to those affected facilities for which construction, modification, or reconstruction commenced after September 18, 2015. Potential affected facilities at the Pioneer Compressor Station include reciprocating compressors (§60.5365a(c)), pneumatic controllers (§60.5365a(d)), storage vessels (§60.5365a(e)), and the fugitive emissions components (§60.5365a(j)).

1. The Pioneer Compressor Station operates five reciprocating compressors which were constructed after the date of applicability and, therefore, are subject to the requirements of Subpart OOOOa. Four of the compressors are driven by the natural gas-fired engines CE-01 to CE-04 to compress the incoming natural gas. The fifth compressor is an electrically driven compressor associated with the vapor recovery unit (VRU-01). The requirements applicable to the reciprocating compressors have been included in Section 5.0. of this operating permit.

2. A pneumatic controller that is not located at a natural gas processing plant is considered an affected facility under Subpart OOOOa only if the unit is natural gas-driven and high-bleed (operates at a natural gas bleed rate greater than 6 scfh). The pneumatic controllers located at the Pioneer Compressor Station are either compressed air-driven or are low-bleed (operates at a natural gas bleed rate less than or equal to 6 scfh). Therefore, the Pioneer Compressor Station is not subject to the Subpart OOOOa requirements for pneumatic controllers.

3. A storage vessel is an affected facility under Subpart OOOOa if the storage vessel has the potential for VOC emissions equal to or greater than 6 tpy as determined according to the methodology of 40 C.F.R. §60.5365a(e). Each of the tanks located at the Pioneer Compressor Station have potential VOC emissions less than 6 tpy and, therefore, are not subject to the Subpart OOOOa requirements for storage vessels.

4. The collection of fugitive emissions components at a compressor station is an affected facility under Subpart OOOOa. The applicable requirements have been included in Section 6.0. of the operating permit.

On June 30, 2021, a joint resolution of Congress that disapproved the final rule titled "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review", 85 FR 57018 (September 14, 2020) (the 2020 Policy Rule), was signed into law. Due to this resolution, sources in the production and processing segments of the natural gas industry that are subject to Subpart OOOOa must meet two sets of standards: the VOC standards of 85 FR 57438 (September 15, 2020) and the methane standards of 81 FR 35898 (June 03, 2016) as amended by 83 FR 10638 (March 12, 2018). The applicable VOC standards and methane standards have both been included in this operating permit. However, compliance with the VOC standards may be demonstrated through compliance with the more stringent methane standards.

Section 5.0. – Subpart OOOOa Requirements for the Reciprocating Compressors associated with CE-01 to CE-04 and VRU-01

The five reciprocating compressors 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 OOOOa** – *Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced After September 18, 2015*

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	R13-3491B Condition
5.1.1.	Affected facilities must be maintained and operated in a manner consistent with good air pollution control practice for minimizing emissions.	45CSR16 40 C.F.R. §60.5370a(b)	N/A
5.1.2.	GHG and VOC standards for reciprocating compressor affected facilities.	45CSR13 45CSR16 40 C.F.R. §60.5385a	12.1.1.
5.2.1.	Initial compliance demonstration requirements.	45CSR13 45CSR16 40 C.F.R. §§60.5410a and 60.5410a(c)	12.2.1.
5.2.2.	Continuous compliance demonstration requirements.	45CSR13 45CSR16 40 C.F.R. §60.5415a(c)	12.3.1.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-3491B Condition
5.4.1.	Applicable recordkeeping requirements for the reciprocating compressors.	45CSR13 45CSR16 40 C.F.R. §§60.5420a(c), (c)(3), (c)(6) to (c)(9), and (c)(17)	12.4.3.
5.5.1.	Applicable reporting requirements for the reciprocating compressors.	45CSR13 45CSR16 40 C.F.R. §§60.5420a(b), (b)(1), (b)(4), (b)(11), and (b)(12)	12.4.2. and 12.4.3.

NOTE: Condition 12.4.1. of R13-3491B has not been included in this operating permit. This condition requires the permittee to submit the notifications specified in 40 C.F.R. §§60.5420a(a)(1) and (a)(2). However, (a)(1) does not require the notifications of 40 C.F.R. §§60.7(a)(1), (a)(3), and (a)(4) for reciprocating compressors, and the notifications of (a)(2) are applicable to well affected facilities.

Section 6.0. – Subpart OOOOa Requirements for Fugitive Emissions Components

Per 40 C.F.R. §60.5430a, a fugitive emissions component is "any component that has the potential to emit fugitive emissions of methane or VOCs at a compressor station, including but not limited to valves, connectors, pressure relief devices, open-ended lines, flanges, covers and closed vent systems not subject to §60.5411a, thief hatches or other openings on a controlled storage vessel not subject to §60.5395a, compressors, instruments, and meters. Devices that vent as part of normal operations, such as the 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."

Due to the disapproval of the 2020 Policy Rule, the fugitive emissions components are subject to varying requirements for methane and VOCs. The standards, recordkeeping requirements, and reporting requirements have been included in the operating permit as separate conditions for each set of standards.

Additionally, certain Subpart OOOOa requirements related to fugitive emissions components vary from those previously included in R13-3491B. The following applicable requirements included in the operating permit have been updated since initially included in R13-3491B:

1. The methane standards of §60.5397a(h)(2).

2. The VOC standards of §§60.5397a(c)(8), (d), (f)(2), (g)(2), and (h); the recordkeeping requirements of §60.5420a(c)(15); and the reporting requirements of §60.5420a(b)(7).

The fugitive emissions components 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 OOOOa** – *Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced After September 18, 2015*

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	R13-3491B Condition
6.1.1.	Affected facilities must be maintained and 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.	Methane standards for fugitive emissions components affected facilities. Refer to 81 FR 35898 (June 03, 2016) as amended by 83 FR 10638 (March 12, 2018).	45CSR13 45CSR16 40 C.F.R. §§60.5397a(a) through (e), (f)(2), (g), (g)(2) through (4), and (h) through (j)	13.1.1.
6.1.3.	VOC standards for fugitive emissions components affected facilities. Compliance with the methane standards in Condition 6.1.2. demonstrates compliance with these VOC standards. Refer to 85 FR 57438 (September 15, 2020).	45CSR13 45CSR16 40 C.F.R. §§60.5397a(a), (a)(1), (b) through (e), (f)(2), (g), (g)(2) through (4), and (h) through (j)	13.1.1.
6.2.1.	Initial compliance demonstration for the VOC and Methane Standards.	45CSR13 45CSR16 40 C.F.R. §§60.5410a and 60.5410a(j)	13.2.1. and 13.2.2.
6.2.2.	Continuous compliance demonstration for the VOC and Methane Standards.	45CSR13 45CSR16 40 C.F.R. §60.5415a(h)	13.3.1.
6.4.1.	Recordkeeping requirements for Methane Standards. Refer to 81 FR 35898 (June 03, 2016) as amended by 83 FR 10638 (March 12, 2018).	45CSR13 45CSR16 40 C.F.R. §§60.5420a(c), (c)(15), and (c)(15)(i) to (ii)	13.4.3.
6.4.2.	Recordkeeping requirements for VOC Standards. Compliance with the recordkeeping requirements in Condition 6.4.1. demonstrates compliance with this condition. Refer to 85 FR 57438 (September 15, 2020).	45CSR13 45CSR16 40 C.F.R. §§60.5420a(c), (c)(15), (c)(15)(i), (c)(15)(vi), and (c)(15)(vii)	13.4.3.
6.5.1.	Reporting requirements for Methane Standards. Refer to 81 FR 35898 (June 03, 2016) as amended by 83 FR 10638 (March 12, 2018).	45CSR13 45CSR16 40 C.F.R. §§60.5420a(b), (b)(1), (b)(7), and (b)(11)	13.4.2.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-3491B Condition
6.5.2.	Reporting requirements for VOC Standards. Compliance with the reporting requirements of Condition 6.5.1. demonstrates compliance with this condition. Refer to 85 FR 57438 (September 15, 2020).	45CSR13 45CSR16 40 C.F.R. §§60.5420a(b), (b)(1), (b)(7), and (b)(11)	13.4.2.

NOTE: The following conditions of R13-3491B have not been included in the operating permit:

1. Condition 13.1.1.(g)(4) – This condition contains the requirements of 40 C.F.R. §60.5397a(g)(5). The requirement is inapplicable to the Pioneer Compressor Station as the requirement applies to the collection of fugitive emissions components at a compressor station located within an area that has an average calendar month temperature below 0˚Fahrenheit for two of three consecutive calendar months of the quarterly monitoring period.

2. Condition 13.4.1. – This condition requires the permittee to submit the notifications specified in 40 C.F.R. §60.5420a(a)(1). However, (a)(1) does not require the notifications of 40 C.F.R. §§60.7(a)(1), (a)(3), and (a)(4) for the collection of fugitive emissions components at a compressor station.

3. Condition 13.4.3.(iii) – This condition contains the requirement of 40 C.F.R. §60.5420a(c)(15)(iii). This requirement only applies to compressor stations for which a monitoring survey is waived under §60.5397a(g)(5). Therefore, this requirement is inapplicable to the Pioneer Compressor Station.

Section 7.0. – Natural Gas Dehydration Units [Emission Point IDs: 7E through 11E]

Two triethylene glycol (TEG) dehydration units are operated at the facility to remove water vapor from the inlet wet gas stream to meet pipeline specifications. Each dehydrator is comprised of a contactor/absorber tower, a flash tank (Emission Units: DFT-01 and DFT-02; Emission Point IDs: 7E and 9E), and a regenerator/still vent (Emission Units: DSV-01 and DSV-02; Emission Point IDs: 8E and 10E). Each dehydration unit is associated with a reboiler (Emission Units: RBV-01 and RBV-02; Emission Point IDs: 12E and 13E), 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 laden with water and trace amounts of hydrocarbons. The rich glycol is then routed to a flash tank where the glycol pressure is reduced to liberate the lighter hydrocarbons, primarily methane. The lighter hydrocarbons are routed from the flash tank to the reboiler for use as fuel with the excess hydrocarbons vented to the thermal oxidizer (Emission Unit: TO-01; Emission Point ID: 11E). The rich glycol is then sent from the flash tank to the regenerator/still where the TEG is heated to drive off the water vapor and any remaining hydrocarbons. The off-gases from the regenerator/still are vented to TO-01.

The primary pollutants emitted in this process are VOCs and HAPs. The thermal oxidizer TO-01 is operated to achieve a 99.5% control efficiency of these pollutants. TO-01 has a maximum design heat input of 10.00 mmBTU/hr.

The TEG dehydration units and the thermal oxidizer are subject to the following regulations:

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

This rule establishes emission standards to control the particulate matter emissions from the combustion of refuse. Under 45CSR§6-2.7., 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 the thermal oxidizer combusts waste vapors from the dehydration units, the emission standards of 45CSR§6-4 are applicable to TO-01.

a. Per 45CSR§6-4.1., 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 loaded into the thermal oxidizer is 668 lbs/hr (0.334 tons/hr). Since the incinerator capacity of the thermal oxidizer is less than 15,000 lbs/hr, the factor F is 5.43 for each unit in accordance with Table I of 45CSR§6-4.1.

The PM emission limit of the thermal oxidizer is:

$$5.43 \times 0.334\ tons/hr = 1.81\ lbs/hr$$

The thermal oxidizer TO-01 has the potential-to-emit PM at a rate of 0.07 lbs/hr. Therefore, as the limit established above is much greater than the potential emissions from the thermal oxidizer, compliance should be demonstrated through the NSR permit requirements to route waste vapors to the thermal oxidizer (Condition 7.1.3.a.), to operate the thermal oxidizer with a flame present (Condition 7.1.3.b.), and to continuously monitor for the presence of the pilot flame (Condition 7.2.1.).

b. Although the facility is located in Ohio County, 45CSR§6-4.2. is inapplicable to the thermal oxidizer because industrial incinerators are exempt from the requirement.

c. The thermal oxidizer must meet the 20% opacity limit of 45CSR§6-4.3., except as specified in 45CSR§6-4.4. As the potential PM emissions from the flare are minimal, compliance with the requirements should be demonstrated by operating the units with no visible emissions except for periods not to exceed five minutes in any two-hour period (Condition 7.1.3.e.), by operating the thermal oxidizer with a flame present (Condition 7.1.3.b.), and by conducting a Method 22 opacity test (Condition 7.3.1.).

d. The thermal oxidizer 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 flare, respectively.

e. At the discretion of the Secretary, the permittee may also be required to conduct stack testing 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 Pioneer 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. As the potential HAP emissions are below major source thresholds, the Pioneer Compressor Station is an area source of HAPs. Therefore, the TEG dehydration units are the only affected sources subject to Subpart HH in accordance with §63.760(b)(2).

Provided that the actual average benzene emissions remain less than 0.90 megagrams per year (1 tpy) from each unit, 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 the exemption, the permittee is subject to the general requirement of §63.764(j); the monitoring requirements 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	R13-3491B Condition
7.1.1.	The maximum throughput of dry natural gas for each dehydration unit/still column shall not exceed 125 mmscfd.	45CSR13	6.1.1.
7.1.2.	The thermal oxidizer shall be operated to achieve a control efficiency of 99.5% for VOC and HAP emissions from the dehydration units.	45CSR13	6.1.2.
7.1.3.	Design and operation requirements for the thermal oxidizer TO-01. The manufacturer has guaranteed that the thermal oxidizer will achieve the required destruction efficiency when operated at a minimum combustion chamber temperature of 1,650˚F. This operating parameter has been specified in paragraph c. of this condition. The applicable emission standards of 45CSR6 have been added as paragraphs f.1. through f.5. of this condition.	45CSR§§6-4.1. and -4.3. through -4.6. 45CSR13 45CSR§30-5.1.c.	6.1.3.
7.1.4.	Maximum hourly and annual emission limits for NO_X, CO, VOCs, and aggregate HAPs from the thermal oxidizer.	45CSR13	6.1.4.
7.1.5.	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)	6.1.5.
7.1.6.	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)	6.1.6

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-3491B Condition
7.1.7.	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 thermal oxidizer's operation requirements in 7.1.3.b. and d. is demonstrated by monitoring the pilot flame with a thermocouple.	45CSR13	6.2.1.
7.2.2.	The dry natural gas throughput to the dehydration unit must be monitored.	45CSR13	6.2.2.
7.2.3.	The combustion chamber temperature and residence time shall be continuously monitored and recorded. Any deviations from the minimum temperature must be reported.	45CSR§30-5.1.c.	N/A
7.3.1.	Method 22 visible emissions testing must be conducted for the thermal oxidizer to demonstrate compliance with the requirements of Condition 7.1.3.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 7.1.4. 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.
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 of 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 each combustor.	45CSR§§6-7.1. and -7.2.	N/A
7.4.1.	Compliance with Condition 7.1.1. must be demonstrated by maintaining records of the dry natural gas throughput for the dehydration units DSV-01 and DSV-02.	45CSR13	6.4.1.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-3491B Condition
7.4.2.	To demonstrate compliance with the emission limitations, the HAP major source thresholds, and the benzene exemption, the permittee must maintain records of monitoring data, wet gas sampling, and annual GRI-GLYCalc™/ProMax emission estimates.	45CSR13 45CSR§30-5.1.c.	6.4.2.
7.4.3.	Compliance with Condition 7.3.1. is demonstrated by maintaining records of each visible emission check.	45CSR13	6.4.3.
7.4.4.	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)	N/A
7.4.5.	Maintain records of the combustion chamber temperature and residence time.	45CSR§30-5.1.c.	N/A
7.4.6.	Maintain a copy of the manufacturer's operation and maintenance specifications on-site.	45CSR§30-5.1.c.	N/A
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 thermal oxidizer design or operation criteria of Condition 7.1.3.	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. – Dehydration Unit Reboilers [Emission Point IDs: 12E and 13E]

Each TEG dehydration unit is associated with a 2.00 mmBTU/hr reboiler (RBV-01, RBV-02) which supplies heat to the regenerator/still. Lighter hydrocarbons formed in the flash tanks during dehydration operations are routed to the respective reboiler for fuel.

The reboilers 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 are subject to the particulate matter emission standards of this rule.

The reboilers 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 8.1.2. 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 the reboilers each 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 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 the reboilers are not part of a manufacturing process, and Section 5 is inapplicable because the units do not combust a refinery or other process gas stream.

   Therefore, although the reboilers RBV-01 and RBV-02 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	R13-3491B Condition
8.1.1.	Maximum design heat input of the reboilers.	45CSR13	7.1.1.
8.1.2.	45CSR2 visible emission limit.	45CSR§2-3.1. 45CSR13	7.1.2.
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.	45CSR§2-3.2. 45CSR13	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.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-3491B Condition
8.5.1.	The permittee must report any deviations from the allowable visible emissions limit.	45CSR13	7.5.1.

Section 9.0. – Condensate Storage Tanks and Produced Water Storage Tanks [Emission Point IDs: 15E to 22E]

Eight storage tanks with applicable requirements are operated at the Pioneer Compressor Station. Condensate from the condensate stabilizer (Emission Unit: STAB) is stored in six 400 bbl storage tanks (Emission Units: TK-01 to TK-06), and produced water from the inlet separator and the dehydrators are stored in two 400 bbl storage tanks (Emission Units: TK-07 and TK-08).

Gas vapors from the storage tanks are routed to a vapor recovery unit (Control Device: VRU-01) with a backup flare to achieve a 98% control efficiency for VOCs and HAPs. Condensate and produced water are removed from the facility via tanker trucks.

The storage tanks and vapor recovery unit 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	R13-3491B Condition
9.1.1.	VOC and HAP emissions from the tanks TK-01 to TK-08 must be routed to the vapor recovery unit VRU-01 to achieve a 98% control efficiency.	45CSR13	8.1.1.
9.1.2.	Maximum annual throughput of condensate/produced water to each storage tank.	45CSR13	8.1.3.
9.2.1.	The permittee must monitor the throughput of product to the storage tanks.	45CSR13	8.2.1.
9.2.2.	Compliance with Condition 9.1.1. is demonstrated by monitoring VRU-01 according to the plans and specifications and manufacturer's recommendations.	45CSR13	8.2.2.
9.4.1.	Records for VRU-01 and TK-01 to TK-08 must be kept in accordance with Condition 3.4.2. of this operating permit.	45CSR13	8.3.1.
9.4.2.	Records of the aggregate throughput for the storage tanks must be maintained.	45CSR13	8.3.4.
9.4.3.	Design records, maintenance records, and records of downtime must be kept for VRU-01.	45CSR13	8.3.5.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-3491B Condition
9.5.1.	Upon request, the permittee must report deviations of when the control device was operated outside of the parameters of the monitoring plan.	45CSR13	8.4.1.
9.5.2.	The permittee must report if downtime of the VRU is in excess of 2%, based on the 12-month rolling total.	45CSR13	8.4.2.

Section 10.0. – Truck Loading [Emission Point ID: 23E]

Stabilized condensate and produced water collected into the storage tanks is removed from the facility via tanker trucks. Gas vapors from truck loading operations are routed to the vapor recovery unit VRU-01 for a 98% control efficiency of VOCs and HAPs.

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	R13-3491B Condition
10.1.1.	All above-ground piping, valves, pumps, etc. shall be installed, maintained, and operated to prevent any substantive fugitive emissions.	45CSR13	9.1.1.
10.1.2.	Maximum annual throughput of produced water in truck loading operations.	45CSR13	9.1.2.
10.1.3.	Maximum annual throughput of condensate in truck loading operations.	45CSR13	9.1.3.
10.1.4.	Truck loading operations must be completed with submerged filling and emissions must be controlled by the vapor recovery unit (VRU-01).	45CSR13	9.1.4.
10.4.1.	Records required in Section 10.4. must be kept in accordance with Condition 3.4.2.	45CSR13	9.3.1.
10.4.2.	Maintain records of the throughput for truck loading operations.	45CSR13	9.3.2.

Section 11.0. – Compressor Blowdown, Pigging, and Condensate Stabilizer Operations controlled by Elevated Flare [Emission Point IDs: 6E, 24E, 25E, and 14E]

Compressor blowdown and emergency shutdown testing (Emission Unit: CBD), pigging operations (Emission Unit: PIG), and condensate stabilizer operations (Emission Unit: STAB) are conducted at the facility. Emissions from CBD and PIG are routed to the elevated flare (Emission Unit: FLR-01). Emissions from STAB are normally captured by the vapor recovery unit VRU-01 and routed to the facility inlet; however, due to downtime for planned preventative

maintenance of the condensate stabilizer overheads compressor, the stabilizer overheads are sent to the elevated flare for up to five days per year. The elevated flare has a control efficiency of 98% for VOCs and HAPs.

The compressor blowdown, pigging, and condensate stabilizer operations and the elevated flare are subject to the following regulations:

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

   This rule establishes emission standards to control the particulate matter (PM) emissions from the combustion of refuse. Under 45CSR§6-2.7., 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 the flare combusts waste vapors from the compressor blowdown events, the pigging events, and the condensate stabilizer operations, the emission standards of 45CSR§6-4 are applicable to the flare FLR-01.

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

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

   Based on the total volume of gas sent to the flare (5,730 scf/hr) and the average density of the gas (0.0585 lbs/scf), the maximum rate at which gas is loaded into the flare is 335.21 lbs/hr (0.1676 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.

   Therefore, the PM emission limit of the flare is:

   $$5.43 \times 0.1676\ tons/hr = 0.91\ lbs/hr$$

   The flare FLR-01 has the potential-to-emit PM at a rate of 0.06 lbs/hr. Therefore, as the limit established above is much greater than the potential emissions from the flare, compliance should be demonstrated through the NSR permit requirements to monitor the waste gas throughput of the flare (Condition 11.1.6.), to operate the flare with a pilot flame when emissions are vented (Condition 11.1.8.), and to continuously monitor for the presence of the pilot flame (Condition 11.2.1.).

   b. Although the facility is located in Ohio County, 45CSR§6-4.2. is inapplicable to FLR-01 because flares are exempt from the requirement.

   c. The flare must meet the 20% opacity limit of 45CSR§6-4.3., except as specified in 45CSR§6-4.4. As the potential PM emissions from the flare are minimal, compliance with the requirements should be demonstrated through maintaining the pilot flame of the flare when emissions are vented as required by Condition 11.1.8. and by conducting Method 9 emission observations as required by Condition 11.3.1.

   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 flare, respectively.

   e. At the discretion of the Secretary, the permittee may be required to conduct stack testing 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*

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	R13-3491B Condition
11.1.1.	The annual limit for the number of compressor blowdown events and the volume per event.	45CSR13	10.1.1.
11.1.2.	The annual limits for the number of low pressure and high pressure pigging events as well as the maximum volume per event.	45CSR13	10.1.2.
11.1.3.	The annual limit for the number of plant shutdowns and the maximum volume per event.	45CSR13	10.1.3.
11.1.4.	The waste gas from compressor blowdown and pigging operations must be controlled at all times to achieve a 98% control efficiency for VOCs and HAPs.	45CSR13	10.1.4.
11.1.5.	NO_X, CO, and VOC emission limits for the elevated flare.	45CSR13	10.1.5.
11.1.6.	Annual limit for the volume of gas consumed in the flare.	45CSR13	10.1.7.
11.1.7.	45CSR6 applicable requirements for the flare, including the visible emissions requirement of Condition 10.1.8. of R13-3491B.	45CSR13 45CSR§§6-4.1. and -4.3. through -4.6.	10.1.8.
11.1.8.	The pilot flame of the flare must be operated at all times when emissions may be vented.	45CSR13	10.1.9.
11.1.9.	The flare shall be designed and operated in accordance with the application for R13-3491.	45CSR13	10.1.10.
11.1.10.	The condensate stabilizer overheads shall be routed to VRU-01, except for 120 hours per year during which the overheads must be routed to FLR-01.	45CSR13	10.1.12.
11.2.1.	Compliance with Condition 11.1.8. will be demonstrated by using a thermocouple to monitor the flare pilot flame.	45CSR13	10.2.1.
11.2.2.	Compliance with Condition 11.1.6. will be demonstrated by monitoring the throughput to the flare.	45CSR13	10.2.2.
11.3.1.	Compliance with the visible emissions limit of Condition 11.1.7.b. shall be demonstrated by conducting Method 9 emission observations as designated by the Secretary.	45CSR13	10.3.1.
11.3.2.	Particulate matter emissions testing for the flare.	45CSR§§6-7.1. and -7.2.	N/A
11.4.1.	Records required in Section 11.4. must be kept in accordance with Condition 3.4.2.	45CSR13	10.4.1.

Title V Permit Condition	Summary of Permit Condition	Regulatory Citation	R13-3491B Condition
11.4.2.	Compliance with 11.1.1. is demonstrated by maintaining a record of compressor blowdown events and the estimated volume per event.	45CSR13	10.4.2.
11.4.3.	Compliance with 11.1.2. is demonstrated by maintaining a record of pigging events and the estimated volume per event.	45CSR13	10.4.3.
11.4.4.	Compliance with 11.1.3. is demonstrated by maintaining a record of shutdown events and the estimated volume per event.	45CSR13	10.4.4.
11.4.5.	Compliance with 11.1.8. and 11.2.1. is demonstrated by maintaining a record of all the times and duration of periods when the pilot flame is absent.	45CSR13	10.4.5.
11.4.6.	Compliance with the visible emission requirement of 11.1.7.b. is demonstrated by maintaining records of testing conducted according to 11.3.1.	45CSR13	10.4.6.
11.4.7.	Records must be kept for the monitoring requirement of Section 11.2. and the testing requirements of Section 11.3.	45CSR13	10.4.7.
11.4.8.	Compliance with 11.1.10. is demonstrated by maintaining records of the hours that stabilization overheads are routed to the flare.	45CSR13	10.4.8.
11.5.1.	The results of visible emissions testing conducted according to 11.3.1. must be submitted within sixty days.	45CSR13	10.5.1.
11.5.2.	Any deviations from the allowable visible emissions limit of 11.1.7.b. must be reported within ten days.	45CSR13	10.5.2.
11.5.3.	Any deviations from the flare design and operation criteria of Condition 11.1.9 and the permit application for R13-3491 must be reported within ten days.	45CSR13	10.5.3.
11.5.4.	Emergency use of the flare must be reported to the Director.	45CSR13	10.5.4.
11.5.5.	The permittee must report any time the flare is not operating when emissions are vented to it.	45CSR13	10.5.5.

NOTE: Condition 10.1.11. of R13-3491B has not been included in this operating permit. This condition requires the permittee to comply with the emergency and affirmative defense requirements contained in Section 2.12. of the NSR permit. However, following the issuance of R13-3491B, the emergency requirements were removed from the general conditions of NSR permits and Title V operating permits as the authority for this section, 45CSR§30-5.7., was removed from the rule.

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 Ohio 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 Pioneer 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 Pioneer 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 Pioneer 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, 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 Pioneer 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 Pioneer 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 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* – Construction of the Pioneer Compressor Station began after the applicability date, and, therefore, Subpart OOOO does not apply to the facility.

11. **40 C.F.R. Part 63 Subpart HHH** – *National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities* – The Pioneer 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 Pioneer Compressor Station is not subject to Subpart HHH.

12. **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 Pioneer Compressor Station is not a major source of hazardous air pollutants.

13. **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 Pioneer Compressor Station is not a major source of hazardous air pollutants.

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 (RBV-01 and RBV-02) operated at the Pioneer Compressor Station are not subject to Subpart JJJJJJ.

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

    The condensate storage tanks (T-01 to T-06), the produced water tanks (T-07 and T-08), pigging operations (PIG), and condensate stabilizer operations (STAB) 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), the storage tanks, pigging operations, and condensate stabilizer operations are not subject to CAM.

    The compressor engines (CE-01 to CE-04) 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 CAM rule is applicable to each of the dehydration units (DFT-01/DSV-01 and DFT-02/DSV-02) and the compressor blowdown operations (CBD) for VOC emissions.

    a. Emissions of VOCs from the dehydration units are controlled by the thermal oxidizer TO-01 (§64.2(a)(2)); the thermal oxidizer is subject to an emission limit for VOCs under the NSR permit (§64.2(a)(1)); and each dehydration unit has pre-control device VOC emissions of 554.91 tpy which exceeds the Title V major source threshold (§64.2(a)(3)).

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

    b. Emissions of VOCs due to compressor blowdown operations are controlled by the elevated flare FLR-01 (§64.2(a)(2)); the flare is subject to emission limits for VOCs under the NSR permit (§64.2(a)(1)); and the compressor blowdown operations have pre-control device emissions of 189.30 tpy of VOCs which exceeds the Title V major source threshold (§64.2.(a)(3)).

    However, as the post-control device VOC emissions of the dehydration units and the compressor blowdown operations are below the Title V major source thresholds, each of these units are considered "Other Pollutant-Specific Emissions 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.

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>

FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Steeber, Jeff <Jeff.Steeber@williams.com> Wed, Feb 21, 2024 at 11:20 AM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

There should be no issues with following Mountaineer's approach.

Thank you.

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Wednesday, February 21, 2024 10:59 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Jeff,

[Quoted text hidden]

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

FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Barron, Sarah K <sarah.k.barron@wv.gov> Wed, Feb 21, 2024 at 10:59 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Jeff,

Is there any issue with including monitoring of the thermal oxidizer's operating specifications similar to what was added to the Title V permit for the Mountaineer Compressor Station? This includes a requirement to continuously monitor and record the combustion chamber's temperature and residence time and to maintain a copy of the manufacturer's operation and maintenance specifications on-site.

I'll send you a copy of the pre-draft permit to review soon.

Thanks,
- Sarah

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

FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Steeber, Jeff <Jeff.Steeber@williams.com> Tue, Feb 20, 2024 at 11:35 AM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

Using the Inlet Wet Gas Summary on Page 114, I've calculated the density to be approximately 0.1052 lb/scf using the Assumed "Worst Case" values and 0.0585 lb/scf using the actual Representative Wet Gas Analysis.

Component	Representative Wet Gas Analysis			Assumed "Worst-Case" 110% VOC and GHG		Margin for Changes in Future Condensate Composition
	Mole %	Wgt %	lb/MMscf	Wgt %	lb/MMscf	
CO2	0.10	0.19	110.29	0.34	200.00	81% Margin
Methane*	72.70	52.51	30,734	57.76	33,850	10% Margin
Other (N2, C2, O2, CO, H2O)	16.71	22.57	13,209	14.68	8,600	--- Margin
VOC**	10.50	24.74	14,481	27.22	15,950	10% Margin
Total Gas	**100.00**	**100.00**	**58,535**	**100.00**	**58,600**	--- Margin
Benzene***	0.0026	0.0091	5.35	0.02	25.00	367% Margin
Ethylbenzene***	0.0003	0.0014	0.84	0.04	25.00	2879% Margin
Hexane, n-***	0.1742	0.6758	395.58	0.85	500.00	26% Margin
Methanol (MeOH)	0.0003	0.0004	0.25	0.04	25.00	9769% Margin
Toluene***	0.0039	0.0162	9.47	0.04	25.00	164% Margin
2,2,4-Trimethylpentane***	0.0022	0.0113	6.62	0.04	25.00	278% Margin
Xylenes***	0.0056	0.0268	15.67	0.04	25.00	60% Margin
Total HAP*	**0.19**	**0.74**	**433.79**	**1.08**	**650.00**	50% Margin

I recommend using the actual representative of 0.0585 lb/scf since we do not see much change year over year in the composition. ~ similar to methane density.

335.21 (lb/hr)=0.0585×5,730

335.21 (lb/hr) = 0.168 ton/hr

Emissions = 5.43 x 0.168 tons/hr

Emissions = 0.91 lbs/hr

Please let me know if you have any questions or concerns.

From: Steeber, Jeff
Sent: Monday, February 19, 2024 3:52 PM
To: Barron, Sarah K <sarah.k.barron@wv.gov>
Subject: RE: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hi Sarah,

The Flares Capacity should be as:

Flare Tip Specification Sheet

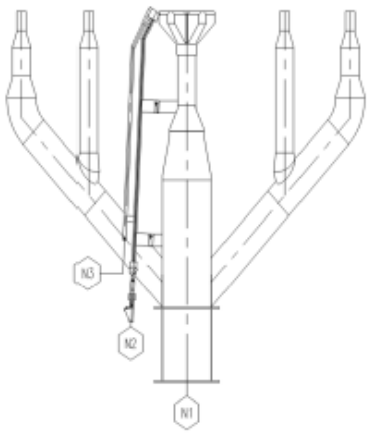
Client:	Williams	Zeeco Ref.:	2017-03133FL-01	Date:	13-Jul-17
Location:	West Virgina	Client Ref.:	Pioneer	Rev.	2

General Information:

Tag No.:	FL-7002 Pioneer	
Model:	MJ-16	Type: Sonic
Length:	10'- 0 "	
Weight:	1298.26444444444 lbs	
No. of Pilots:	2	

Design Case:

Governing Case:	Pioneer Max
Molecular Weight:	22.0
L. H. V. :	1,200 BTU/SCF
Temperature:	-26 Deg. F
Available Static Pressure:	35 psig
Design Flow Rate:	460,660 lbs/hr
Approximate Exit Velocity:	1129 ft/s
Mach No.:	1.00
Approx. Tip Press. Drop:	31.14 psig



(Typical drawing only)

460,660 lbs/hr : 230.33 ton/hr.

F- 2.72

2.72*230.33

Emissions = 626.50 lbs/hr

Please let me know if you have any further questions or concerns.

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Thursday, February 15, 2024 5:28 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>

Subject: Re: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Jeff,

Thanks for letting me know about the monitoring for the thermal oxidizer. Do you have any further update for the flare's incinerator capacity?

Thanks,

- Sarah

On Thu, Feb 8, 2024 at 6:57 PM Steeber, Jeff <Jeff.Steeber@williams.com> wrote:

> Thank you for the clarification; I have no further questions.
>
> As for the residence time, we adhere to the procedural standards outlined in the Mountaineer TVOP, which includes the continuous monitoring and recording of the combustion chamber temperature. This, in turn, ensures we are aligned with the manufacturer's recommended residence time.
>
> Let me know if you need further information on RT/Temperature monitoring methods. Working on getting flare loading over by tomorrow.
>
> Thanks,
>
> Jeff
>
> ---
>
> **From:** Barron, Sarah K <sarah.k.barron@wv.gov>
> **Sent:** Thursday, February 8, 2024 5:30 PM
> **To:** Steeber, Jeff <Jeff.Steeber@Williams.com>
> **Subject:** Re: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477
>
> Hi, Jeff.
>
> The factor F was established when 45CSR6 was written and likely accounts for the unit change. The incinerator capacity is meant to be in units of lbs/hr when determining the value of the factor F and in units of tons/hr when substituted into the formula. The product of the factor and the incinerator capacity then yields the allowable PM emissions limit in units of lbs/hr.
>
> So if the thermal oxidizer's incinerator capacity is 668 lbs/hr:

- As you stated in your message, the factor F would be 5.43 because 668 lbs/hr < 15,000 lbs/hr.
- The incinerator capacity of 668 lbs/hr would then be converted to units of tons/hr, or 0.334 tons/hr.
- The product of this incinerator capacity (0.334 tons/hr) and the applicable factor F (5.43) then yields the particulate matter emissions limit in units of lbs/hr.

Emissions (lbs/hr) = F x Incinerator Capacity (tons/hr)

Emissions = 5.43 x 0.334 tons/hr

Emissions = 1.81 lbs/hr

So with an incinerator capacity of 668 lbs/hr, the thermal oxidizer's PM emission limit is 1.81 lbs/hr. In the application, you reported that the PTE for PM from the thermal oxidizer is 0.07 lbs/hr. The PTE for PM is significantly less than the 45CSR6 PM emission limit which is to be expected given that the thermal oxidizer is being used to combust waste gas.

Please let me know if you have any further questions.

- Sarah Barron

On Thu, Feb 8, 2024 at 3:17 PM Steeber, Jeff <Jeff.Steeber@williams.com> wrote:

> Good Afternoon Sarah,
>
> I believe I have the loading values for the thermal oxidizer.
>
> According to Zeeco's Guarantee (Streams 1-4) have a total lb/hr of 668.0 lb/hr (Streams 5 & 6 are not included they were included in the original proposal and never pursued design-wise)
>
> F Factor - 5.43 as the loading value is less than 15,000 lb/hr. – Although I'm having issues understanding the WV Incinerator Code Formula, as the units do not match?

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions.

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

Can you clarify, as they state to use incinerator capacity in tons/year but then have emissions in lb/hr? – This yields questionable results.

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Tuesday, February 6, 2024 7:35 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hi, Jeff.

Thanks for forwarding this to me. I've added the minimum operating temperature to the Title V permit with the requirement to operate the thermal oxidizer according to the manufacturer's specifications.

In addition to the loading values for the thermal oxidizer and flare, could you also let me know how the temperature and residence time of the thermal oxidizer are currently monitored? I think that monitoring language will need to be added to the permit for the operating specifications.

Thanks,

- Sarah

On Wed, Jan 31, 2024 at 11:06 AM Steeber, Jeff <Jeff.Steeber@williams.com> wrote:

> Hi Sarah,
>
> Find Zeecos Guarantee letter for Pioneer – will provide loading values shortly.
>
> ---
>
> **From:** Sree Krishnan <Sree_Krishnan@zeeco.com>
> **Sent:** Tuesday, January 30, 2024 11:29 AM
> **To:** Steeber, Jeff <Jeff.Steeber@Williams.com>
> **Cc:** Sydney Levine <Sydney_Levine@zeeco.com>; Tom Owoc <Tom_Owoc@zeeco.com>
> **Subject:** RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477
>
> Morning, Jeff!
>
> Here is the Emissions Guarantee Letter for the Pioneer TO Package – take a look and let me know if you have any questions.
>
> Feel free to give me a call if you need anything else on my end – thanks again for your patience and support!
>
> Regards,
>
> ---
>
> **Sree Krishnan** | Applications Engineer - Thermal Oxidizers & Combustion Systems
>
> | Desk: +1 918 893 8606 | Cell: +1 918 815 8894
>
> ZEECO REDEFINING [COMBUSTION]
>
> ---
>
> **From:** Steeber, Jeff <Jeff.Steeber@Williams.com>
> **Sent:** Monday, January 22, 2024 7:46 AM

To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

!!

Hi Sree,

Glad the holidays went well! I understand. After speaking with WVDAQ, they request that we submit by the end of the month (1/31) at the latest.

Let me know if you have any questions or concerns, I appreciate the support.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Thursday, January 18, 2024 3:57 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hey, Jeff!

The holidays were chaotic but good – I hope you enjoyed them as well!

To be honest, I haven't had a *single* opportunity to work on the Pioneer Guarantee Letter since our last conversation in December – it has been crazy at work for the past several months and it still hasn't let up.

Is there any way you could buy me some more time to get this done for you? The Letter shouldn't take too long for me to complete – just haven't been able to carve out some time to get it done. If you could give me until the end of the month, I'd really appreciate it – let me know if that's too late and I'll do my best to accommodate.

Thanks again for your patience!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Wednesday, January 17, 2024 8:03 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

Hi Sree,

Hope you had a great holiday, just wanted to check in on the status of the TO guarantee letter.

Thanks,

Jeff

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, December 15, 2023 11:15 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Thanks again for taking my call this morning – it was good to hear from you!

Based on my preliminary review of the attached compositions, I still believe that the Pioneer TO will only be able to achieve a 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

As we discussed, the attached compositions are pretty similar to what the unit was originally designed for – there are slight variances, but the major constituents for each Stream are pretty consistent with what we recently evaluated. Drastic changes in flow would definitely have an impact on Destruction Efficiency, but that isn't the

case here – we are considering the same flows of the Flash Gas and Still Vent Wastes (*Wastes 1-4*) as the original design, and the flow of Wastes 5-6 (*going through the N5 nozzle on the Burner*) are not significant (*large*) enough to have a major impact on the unit's overall Destruction Efficiency.

Please share this information with your Environmental Team and let me know if they have any other questions. I will definitely send you guys an updated guarantee letter, but please give me some more time to put it together – I should be able to get it to you after the new year.

Feel free to give me a call if you need anything else in the meantime – thanks again for all of your patience and support thus far!

Have a very Merry Christmas and Happy New Year!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

PLEASE NOTE THAT THE ZEECO HEADQUARTERS OFFICE WILL BE CLOSED BETWEEN MONDAY, DECEMBER 25TH, 2023 AND MONDAY, JANUARY 1ST, 2024 IN OBSERVANCE OF THE CHRISTMAS AND NEW YEAR HOLIDAYS IN THE UNITED STATES. NORMAL BUSINESS HOURS WILL RESUME AT 8:00 AM ON TUESDAY, JANUARY 2ND, 2024.

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, December 14, 2023 8:52 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

No worries, sounds like a plan.

Thank you.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Thursday, December 14, 2023 9:35 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: Re: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Apologies for the delay - it has been crazy over the past few months.

I will give you a call tomorrow to discuss - may be able to get you some preliminary info quickly.

Again - so sorry for the delay.

Regards,

Sree Krishnan | *Applications Engineer, Thermal Oxidizers & Combustion Systems*
Zeeco World Headquarters | 22151 East 91st Street | Broken Arrow, Oklahoma 74014, USA
Main: +1 918 258 8551 | Direct: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, December 14, 2023 3:23:50 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: FW: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

Hi All,

WVDAQ had some questions about the maximum incinerator capacity for our flare and thermal oxidizer at Pioneer Compressor Station, are you able to provide any insight into this?

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Wednesday, December 13, 2023 11:15 AM

To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hi, Jeff.

I just wanted to check in again to see if you have any further information for the operating specifications of the thermal oxidizer?

Additionally, regarding the maximum incinerator capacity of the flare and the thermal oxidizer, it appears that the values that you reported (0.06 lbs/hr for the flare; 0.07 lbs/hr for the thermal oxidizer) are the controlled potential emissions of particulate matter from each of the control devices. Rather than the potential emissions from the devices, the maximum incinerator capacity refers to the maximum rate (lbs/hr) at which the gas/waste gas is loaded into the flare/thermal oxidizer. The incinerator capacity is then used to determine a limit for particulate matter emissions based on the equation in 45CSR§6-4.1. Could you send these rates for the flare and for the thermal oxidizer at the Pioneer Compressor Station?

Thanks,

- Sarah

From: Steeber, Jeff Jeff.Steeber@Williams.com
Sent: Thursday, December 7, 2023 8:54 AM
To: Sree Krishnan Sree_Krishnan@zeeco.com
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Good Morning Sree,

I wanted to check in on the process of this request.

Thanks for the support.

Jeff

From: Steeber, Jeff
Sent: Wednesday, November 15, 2023 3:37 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Hi Sree,

Find an updated Flash/Still composition attached for Pioneer, I've also included a recent fuel gas analysis.

Still working on Blakes information.

Let me know if you have any questions or concerns.

Thanks,

Jeff

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Tuesday, October 31, 2023 10:22 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

No problem, Sir!

Let me know when you have the updated compositions available and I would be happy to take another look for you.

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Monday, October 30, 2023 1:58 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Hi Sree,

Still working on getting an updated composition, will follow up this week.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, October 20, 2023 5:23 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Sounds good, Jeff!

More than happy to jump on a call, if you think it would be helpful.

I look forward to hearing from you soon – have a good weekend!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Friday, October 20, 2023 12:11 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Good Afternoon, Sree,

I'm going to set up a brief call with our facility engineer next week to discuss this further. I want to make sure we are using the most up-to-date gas composition to represent our most current operating practice.

Let me know If you have any questions and be on the lookout for an invite shortly.

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: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, October 20, 2023 12:10 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Good morning, Jeff!

Based on my calculations, the Pioneer and Blake TOs will be able to achieve the 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

I can send you the guarantee letters for both Units based on this temperature – will that work for you?

Feel free to give me a call if you'd like to discuss path forward in more detail – I look forward to hearing from you soon!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, October 12, 2023 8:01 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Sounds Good, Thank you!

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Wednesday, October 11, 2023 4:51 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Thanks for confirming, Jeff!

It will take me some time to prepare the Guarantee Letters for the Pioneer and Blake TOs, but I should be able to have them ready for you in a couple weeks.

Let me know if you have any issues with this timeline and I will do my best to work around your schedule!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Wednesday, October 11, 2023 11:06 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

If you are able to provide a demonstration for Blake as well, it may save time in the long run if this request comes up again.

I appreciate it, please let me know if you need further information.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Wednesday, October 11, 2023 12:00 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Good morning, Jeff!

Sure – I should be able to put together a similar "*VOC Destruction Efficiency Guarantee Letter*" for the unit at an operating temperature of 1,400°F (*minimum*).

Just to confirm – you only need a Letter for the HTO at the Pioneer Compressor Station, right (*WPO 667250 / Zeeco SO 32477*)? I only ask because our quote was for the units that were supplied to both the Blake and Pioneer Facilities.

Let me know if my understanding is correct!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Tuesday, October 10, 2023 12:56 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency

!!

Good Afternoon Sreeram,

Williams Appalachia Midstream has recently submitted an initial Title V Permit Application, for our Pioneer Compressor Station located in Brooke County WV. This facility includes a Zeeco Z-HTO Thermal Oxidizer and a Zeeco MJ-16 Elevated Flare. Upon our submittal to the agency, WVDAQ has requested the minimum VOC Destruction Efficiency in reference to our Thermal Oxidizer. This has similarly been requested recently at Mountaineer (Attached), as you assisted Peter Merranko with the department's request.

Specifically: *"What is the minimum operating temperature necessary for the thermal oxidizer to achieve the required 99.5% control efficiency for VOCs? Sections 4.4 and 5.0 of the proposal reference an operating temperature of 1,800°F. Is this the minimum operating temperature?"* - Currently we are operating the TO in the range of 1400 to 1800, being low and high setpoints.

Would you be able to provide a Zeeco minimum VOC Destruction Efficiency guarantee for the Thermal Oxidizer? – I have attached the initial Zeeco Proposal No. 2017-02645IN-01 Rev 4. (Note: Waste Streams 4 and 5 have not been installed)

Please let me know if you have any questions or concerns regarding this request.

Thanks,

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

2 attachments

image020.png
110K

image021.png
13K

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

FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Steeber, Jeff <Jeff.Steeber@williams.com> Mon, Feb 19, 2024 at 3:51 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

The Flares Capacity should be as:

Flare Tip Specification Sheet

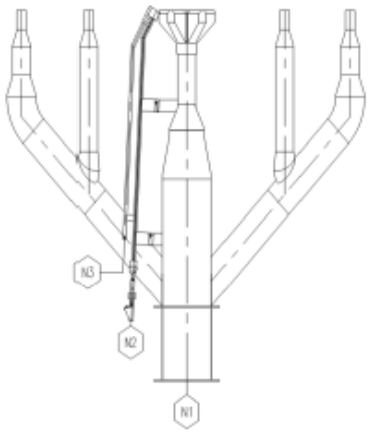
Client:	Williams	Zeeco Ref.:	2017-03133FL-01	Date:	13-Jul-17
Location:	West Virgina	Client Ref.:	Pioneer	Rev.	2

General Information:

Tag No.:	FL-7002 Pioneer	
Model:	MJ-16	Type: Sonic
Length:	10'- 0 "	
Weight:	1298.26444444444 lbs	
No. of Pilots:	2	

Design Case:

Governing Case:	Pioneer Max
Molecular Weight:	22.0
L. H. V. :	1,200 BTU/SCF
Temperature:	-26 Deg. F
Available Static Pressure:	35 psig
Design Flow Rate:	460,660 lbs/hr
Approximate Exit Velocity:	1129 ft/s
Mach No.:	1.00
Approx. Tip Press. Drop:	31.14 psig



(Typical drawing only)

460,660 lbs/hr : 230.33 ton/hr.

F- 2.72

2.72*230.33

Emissions = 626.50 lbs/hr

Please let me know if you have any further questions or concerns.

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Thursday, February 15, 2024 5:28 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Jeff,

Thanks for letting me know about the monitoring for the thermal oxidizer. Do you have any further update for the flare's incinerator capacity?

Thanks,

- Sarah

On Thu, Feb 8, 2024 at 6:57 PM Steeber, Jeff <Jeff.Steeber@williams.com> wrote:

> Thank you for the clarification; I have no further questions.
>
> As for the residence time, we adhere to the procedural standards outlined in the Mountaineer TVOP, which includes the continuous monitoring and recording of the combustion chamber temperature. This, in turn, ensures we are aligned with the manufacturer's recommended residence time.
>
> Let me know if you need further information on RT/Temperature monitoring methods. Working on getting flare loading over by tomorrow.
>
> Thanks,
>
> Jeff
>
> ---
>
> **From:** Barron, Sarah K <sarah.k.barron@wv.gov>
> **Sent:** Thursday, February 8, 2024 5:30 PM
> **To:** Steeber, Jeff <Jeff.Steeber@Williams.com>
> **Subject:** Re: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477
>
> Hi, Jeff.

The factor F was established when 45CSR6 was written and likely accounts for the unit change. The incinerator capacity is meant to be in units of lbs/hr when determining the value of the factor F and in units of tons/hr when substituted into the formula. The product of the factor and the incinerator capacity then yields the allowable PM emissions limit in units of lbs/hr.

So if the thermal oxidizer's incinerator capacity is 668 lbs/hr:

- As you stated in your message, the factor F would be 5.43 because 668 lbs/hr < 15,000 lbs/hr.
- The incinerator capacity of 668 lbs/hr would then be converted to units of tons/hr, or 0.334 tons/hr.
- The product of this incinerator capacity (0.334 tons/hr) and the applicable factor F (5.43) then yields the particulate matter emissions limit in units of lbs/hr.

Emissions (lbs/hr) = F x Incinerator Capacity (tons/hr)

Emissions = 5.43 x 0.334 tons/hr

Emissions = 1.81 lbs/hr

So with an incinerator capacity of 668 lbs/hr, the thermal oxidizer's PM emission limit is 1.81 lbs/hr. In the application, you reported that the PTE for PM from the thermal oxidizer is 0.07 lbs/hr. The PTE for PM is significantly less than the 45CSR6 PM emission limit which is to be expected given that the thermal oxidizer is being used to combust waste gas.

Please let me know if you have any further questions.

- Sarah Barron

On Thu, Feb 8, 2024 at 3:17 PM Steeber, Jeff <Jeff.Steeber@williams.com> wrote:

> Good Afternoon Sarah,
>
> I believe I have the loading values for the thermal oxidizer.
>
> According to Zeeco's Guarantee (Streams 1-4) have a total lb/hr of 668.0 lb/hr (Streams 5 & 6 are not included they were included in the original proposal and never pursued design-wise)
>
> F Factor - 5.43 as the loading value is less than 15,000 lb/hr. – Although I'm having issues understanding the WV Incinerator Code Formula, as the units do not match?

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions.

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

Can you clarify, as they state to use incinerator capacity in tons/year but then have emissions in lb/hr? – This yields questionable results.

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Tuesday, February 6, 2024 7:35 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hi, Jeff.

Thanks for forwarding this to me. I've added the minimum operating temperature to the Title V permit with the requirement to operate the thermal oxidizer according to the manufacturer's specifications.

In addition to the loading values for the thermal oxidizer and flare, could you also let me know how the temperature and residence time of the thermal oxidizer are currently monitored? I think that monitoring language will need to be added to the permit for the operating specifications.

Thanks,

- Sarah

On Wed, Jan 31, 2024 at 11:06 AM Steeber, Jeff <Jeff.Steeber@williams.com> wrote:

> Hi Sarah,
>
> Find Zeecos Guarantee letter for Pioneer – will provide loading values shortly.
>
> ---
>
> **From:** Sree Krishnan <Sree_Krishnan@zeeco.com>
> **Sent:** Tuesday, January 30, 2024 11:29 AM
> **To:** Steeber, Jeff <Jeff.Steeber@Williams.com>
> **Cc:** Sydney Levine <Sydney_Levine@zeeco.com>; Tom Owoc <Tom_Owoc@zeeco.com>
> **Subject:** RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477
>
> Morning, Jeff!
>
> Here is the Emissions Guarantee Letter for the Pioneer TO Package – take a look and let me know if you have any questions.
>
> Feel free to give me a call if you need anything else on my end – thanks again for your patience and support!
>
> Regards,
>
> ---
>
> **Sree Krishnan** | Applications Engineer - Thermal Oxidizers & Combustion Systems
>
> | Desk: +1 918 893 8606 | Cell: +1 918 815 8894
>
> 
>
>
> 
>
> ---
>
> **From:** Steeber, Jeff <Jeff.Steeber@Williams.com>
> **Sent:** Monday, January 22, 2024 7:46 AM

To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

!!

Hi Sree,

Glad the holidays went well! I understand. After speaking with WVDAQ, they request that we submit by the end of the month (1/31) at the latest.

Let me know if you have any questions or concerns, I appreciate the support.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Thursday, January 18, 2024 3:57 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hey, Jeff!

The holidays were chaotic but good – I hope you enjoyed them as well!

To be honest, I haven't had a *single* opportunity to work on the Pioneer Guarantee Letter since our last conversation in December – it has been crazy at work for the past several months and it still hasn't let up.

Is there any way you could buy me some more time to get this done for you? The Letter shouldn't take too long for me to complete – just haven't been able to carve out some time to get it done. If you could give me until the end of the month, I'd really appreciate it – let me know if that's too late and I'll do my best to accommodate.

Thanks again for your patience!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Wednesday, January 17, 2024 8:03 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

Hi Sree,

Hope you had a great holiday, just wanted to check in on the status of the TO guarantee letter.

Thanks,

Jeff

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, December 15, 2023 11:15 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Thanks again for taking my call this morning – it was good to hear from you!

Based on my preliminary review of the attached compositions, I still believe that the Pioneer TO will only be able to achieve a 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

As we discussed, the attached compositions are pretty similar to what the unit was originally designed for – there are slight variances, but the major constituents for each Stream are pretty consistent with what we recently evaluated. Drastic changes in flow would definitely have an impact on Destruction Efficiency, but that isn't the

case here – we are considering the same flows of the Flash Gas and Still Vent Wastes (*Wastes 1-4*) as the original design, and the flow of Wastes 5-6 (*going through the N5 nozzle on the Burner*) are not significant (*large*) enough to have a major impact on the unit's overall Destruction Efficiency.

Please share this information with your Environmental Team and let me know if they have any other questions. I will definitely send you guys an updated guarantee letter, but please give me some more time to put it together – I should be able to get it to you after the new year.

Feel free to give me a call if you need anything else in the meantime – thanks again for all of your patience and support thus far!

Have a very Merry Christmas and Happy New Year!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

PLEASE NOTE THAT THE ZEECO HEADQUARTERS OFFICE WILL BE CLOSED BETWEEN MONDAY, DECEMBER 25TH, 2023 AND MONDAY, JANUARY 1ST, 2024 IN OBSERVANCE OF THE CHRISTMAS AND NEW YEAR HOLIDAYS IN THE UNITED STATES. NORMAL BUSINESS HOURS WILL RESUME AT 8:00 AM ON TUESDAY, JANUARY 2ND, 2024.

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, December 14, 2023 8:52 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

No worries, sounds like a plan.

Thank you.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Thursday, December 14, 2023 9:35 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: Re: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Apologies for the delay - it has been crazy over the past few months.

I will give you a call tomorrow to discuss - may be able to get you some preliminary info quickly.

Again - so sorry for the delay.

Regards,

Sree Krishnan | *Applications Engineer, Thermal Oxidizers & Combustion Systems*
Zeeco World Headquarters | 22151 East 91st Street | Broken Arrow, Oklahoma 74014, USA
Main: +1 918 258 8551 | Direct: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, December 14, 2023 3:23:50 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: FW: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

Hi All,

WVDAQ had some questions about the maximum incinerator capacity for our flare and thermal oxidizer at Pioneer Compressor Station, are you able to provide any insight into this?

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Wednesday, December 13, 2023 11:15 AM

To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hi, Jeff.

I just wanted to check in again to see if you have any further information for the operating specifications of the thermal oxidizer?

Additionally, regarding the maximum incinerator capacity of the flare and the thermal oxidizer, it appears that the values that you reported (0.06 lbs/hr for the flare; 0.07 lbs/hr for the thermal oxidizer) are the controlled potential emissions of particulate matter from each of the control devices. Rather than the potential emissions from the devices, the maximum incinerator capacity refers to the maximum rate (lbs/hr) at which the gas/waste gas is loaded into the flare/thermal oxidizer. The incinerator capacity is then used to determine a limit for particulate matter emissions based on the equation in 45CSR§6-4.1. Could you send these rates for the flare and for the thermal oxidizer at the Pioneer Compressor Station?

Thanks,

- Sarah

From: Steeber, Jeff Jeff.Steeber@Williams.com
Sent: Thursday, December 7, 2023 8:54 AM
To: Sree Krishnan Sree_Krishnan@zeeco.com
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Good Morning Sree,

I wanted to check in on the process of this request.

Thanks for the support.

Jeff

From: Steeber, Jeff
Sent: Wednesday, November 15, 2023 3:37 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Hi Sree,

Find an updated Flash/Still composition attached for Pioneer, I've also included a recent fuel gas analysis.

Still working on Blakes information.

Let me know if you have any questions or concerns.

Thanks,

Jeff

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Tuesday, October 31, 2023 10:22 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

No problem, Sir!

Let me know when you have the updated compositions available and I would be happy to take another look for you.

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Monday, October 30, 2023 1:58 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Hi Sree,

Still working on getting an updated composition, will follow up this week.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, October 20, 2023 5:23 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Sounds good, Jeff!

More than happy to jump on a call, if you think it would be helpful.

I look forward to hearing from you soon – have a good weekend!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Friday, October 20, 2023 12:11 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Good Afternoon, Sree,

I'm going to set up a brief call with our facility engineer next week to discuss this further. I want to make sure we are using the most up-to-date gas composition to represent our most current operating practice.

Let me know If you have any questions and be on the lookout for an invite shortly.

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: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, October 20, 2023 12:10 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Good morning, Jeff!

Based on my calculations, the Pioneer and Blake TOs will be able to achieve the 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

I can send you the guarantee letters for both Units based on this temperature – will that work for you?

Feel free to give me a call if you'd like to discuss path forward in more detail – I look forward to hearing from you soon!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, October 12, 2023 8:01 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Sounds Good, Thank you!

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Wednesday, October 11, 2023 4:51 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Thanks for confirming, Jeff!

It will take me some time to prepare the Guarantee Letters for the Pioneer and Blake TOs, but I should be able to have them ready for you in a couple weeks.

Let me know if you have any issues with this timeline and I will do my best to work around your schedule!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Wednesday, October 11, 2023 11:06 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

If you are able to provide a demonstration for Blake as well, it may save time in the long run if this request comes up again.

I appreciate it, please let me know if you need further information.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Wednesday, October 11, 2023 12:00 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Good morning, Jeff!

Sure – I should be able to put together a similar "*VOC Destruction Efficiency Guarantee Letter*" for the unit at an operating temperature of 1,400°F (*minimum*).

Just to confirm – you only need a Letter for the HTO at the Pioneer Compressor Station, right (*WPO 667250 / Zeeco SO 32477*)? I only ask because our quote was for the units that were supplied to both the Blake and Pioneer Facilities.

Let me know if my understanding is correct!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Tuesday, October 10, 2023 12:56 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency

!!

Good Afternoon Sreeram,

Williams Appalachia Midstream has recently submitted an initial Title V Permit Application, for our Pioneer Compressor Station located in Brooke County WV. This facility includes a Zeeco Z-HTO Thermal Oxidizer and a Zeeco MJ-16 Elevated Flare. Upon our submittal to the agency, WVDAQ has requested the minimum VOC Destruction Efficiency in reference to our Thermal Oxidizer. This has similarly been requested recently at Mountaineer (Attached), as you assisted Peter Merranko with the department's request.

Specifically: *"What is the minimum operating temperature necessary for the thermal oxidizer to achieve the required 99.5% control efficiency for VOCs? Sections 4.4 and 5.0 of the proposal reference an operating temperature of 1,800°F. Is this the minimum operating temperature?"* - Currently we are operating the TO in the range of 1400 to 1800, being low and high setpoints.

Would you be able to provide a Zeeco minimum VOC Destruction Efficiency guarantee for the Thermal Oxidizer? – I have attached the initial Zeeco Proposal No. 2017-02645IN-01 Rev 4. (Note: Waste Streams 4 and 5 have not been installed)

Please let me know if you have any questions or concerns regarding this request.

Thanks,

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

2 attachments

image009.png
13K

Pioneer Flare Max 2023-05-24-AMS Pioneer TVOP APPLICATION.pdf
194K

Flare Tip Specification Sheet

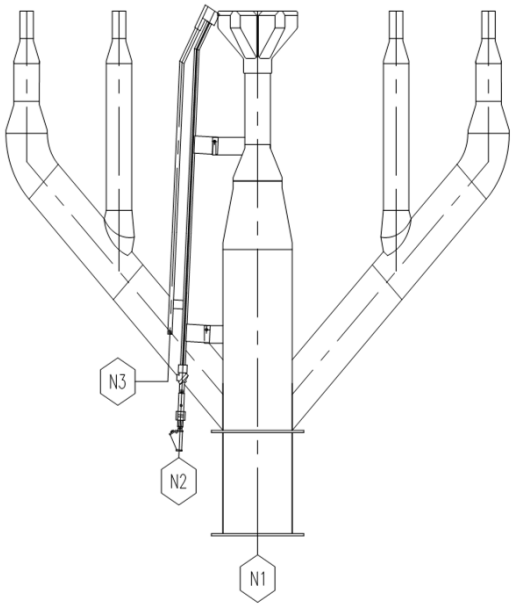
Client:	Williams	Zeeco Ref.:	2017-03133FL-01	Date:	13-Jul-17
Location:	West Virgina	Client Ref.:	Pioneer	Rev.	2

General Information:

Tag No.:	FL-7002 Pioneer	
Model:	MJ-16	Type: Sonic
Length:	10'- 0 "	
Weight:	1298.26444444444 lbs	
No. of Pilots:	2	

Design Case:

Governing Case:	Pioneer Max
Molecular Weight:	22.0
L. H. V. :	1,200 BTU/SCF
Temperature:	-26 Deg. F
Available Static Pressure:	35 psig
Design Flow Rate:	460,660 lbs/hr
Approximate Exit Velocity:	1129 ft/s
Mach No.:	1.00
Approx. Tip Press. Drop:	31.14 psig



(Typical drawing only)

Construction:

Upper Section:	310 SS	Windshield:	NO
Lower Section:	304 SS	Flame Retention Ring:	n/a
Refractory:	None	Lifting Lugs:	YES - S.S. Type
Refractory Thk:	N/A		

Surface Finish (Carbon Steel Surfaces):

Surface Preparation:	SSPC-SP6	Primer:	Inorganic Zinc
Paint (c. s. surfaces):	High Heat Aluminum		

Connections:

	Qty.	Size	Type	Material
N1 - Flare Gas Inlet:	1	16 "	150# RFSO	304 SS
N2 - Pilot Gas:	1	1"	150# RFSW	304 SS
N3 - Ignition Line:	2	1 "	FNPT	304 SS

Miscellaneous Notes:

1. Includes Integral Purge Reducing Velocity Seal.
2. Required Fuel Gas Purge Rate = 760 SCFH.

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

FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Barron, Sarah K <sarah.k.barron@wv.gov> Thu, Feb 15, 2024 at 5:27 PM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Jeff,

Thanks for letting me know about the monitoring for the thermal oxidizer. Do you have any further update for the flare's incinerator capacity?

Thanks,
- Sarah

[Quoted text hidden]
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[Quoted text hidden]

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[Quoted text hidden]
[Quoted text hidden]
[Quoted text hidden]
[Quoted text hidden]

Good morning, Jeff!

Based on my calculations, the Pioneer and Blake TOs will be able to achieve the 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

I can send you the guarantee letters for both Units based on this temperature – will that work for you?

Feel free to give me a call if you'd like to discuss path forward in more detail – I look forward to hearing from you soon!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, October 12, 2023 8:01 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Sounds Good, Thank you!

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Wednesday, October 11, 2023 4:51 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Thanks for confirming, Jeff!

It will take me some time to prepare the Guarantee Letters for the Pioneer and Blake TOs, but I should be able to have them ready for you in a couple weeks.

Let me know if you have any issues with this timeline and I will do my best to work around your schedule!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Wednesday, October 11, 2023 11:06 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>

Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

If you are able to provide a demonstration for Blake as well, it may save time in the long run if this request comes up again.

I appreciate it, please let me know if you need further information.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Wednesday, October 11, 2023 12:00 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Good morning, Jeff!

Sure – I should be able to put together a similar "*VOC Destruction Efficiency Guarantee Letter*" for the unit at an operating temperature of 1,400°F (*minimum*).

Just to confirm – you only need a Letter for the HTO at the Pioneer Compressor Station, right (*WPO 667250 / Zeeco SO 32477*)? I only ask because our quote was for the units that were supplied to both the Blake and Pioneer Facilities.

Let me know if my understanding is correct!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Tuesday, October 10, 2023 12:56 PM

To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency

!!

Good Afternoon Sreeram,

Williams Appalachia Midstream has recently submitted an initial Title V Permit Application, for our Pioneer Compressor Station located in Brooke County WV. This facility includes a Zeeco Z-HTO Thermal Oxidizer and a Zeeco MJ-16 Elevated Flare. Upon our submittal to the agency, WVDAQ has requested the minimum VOC Destruction Efficiency in reference to our Thermal Oxidizer. This has similarly been requested recently at Mountaineer (Attached), as you assisted Peter Merranko with the department's request.

Specifically: *"What is the minimum operating temperature necessary for the thermal oxidizer to achieve the required 99.5% control efficiency for VOCs? Sections 4.4 and 5.0 of the proposal reference an operating temperature of 1,800°F. Is this the minimum operating temperature?"* - Currently we are operating the TO in the range of 1400 to 1800, being low and high setpoints.

Would you be able to provide a Zeeco minimum VOC Destruction Efficiency guarantee for the Thermal Oxidizer? – I have attached the initial Zeeco Proposal No. 2017-02645IN-01 Rev 4. (Note: Waste Streams 4 and 5 have not been installed)

Please let me know if you have any questions or concerns regarding this request.

Thanks,

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

[Quoted text hidden]

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

FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Steeber, Jeff <Jeff.Steeber@williams.com> Thu, Feb 8, 2024 at 6:56 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Thank you for the clarification; I have no further questions.

As for the residence time, we adhere to the procedural standards outlined in the Mountaineer TVOP, which includes the continuous monitoring and recording of the combustion chamber temperature. This, in turn, ensures we are aligned with the manufacturer's recommended residence time.

Let me know if you need further information on RT/Temperature monitoring methods. Working on getting flare loading over by tomorrow.

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Thursday, February 8, 2024 5:30 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hi, Jeff.

The factor F was established when 45CSR6 was written and likely accounts for the unit change. The incinerator capacity is meant to be in units of lbs/hr when determining the value of the factor F and in units of tons/hr when substituted into the formula. The product of the factor and the incinerator capacity then yields the allowable PM emissions limit in units of lbs/hr.

So if the thermal oxidizer's incinerator capacity is 668 lbs/hr:

- As you stated in your message, the factor F would be 5.43 because 668 lbs/hr < 15,000 lbs/hr.
- The incinerator capacity of 668 lbs/hr would then be converted to units of tons/hr, or 0.334 tons/hr.
- The product of this incinerator capacity (0.334 tons/hr) and the applicable factor F (5.43) then yields the particulate matter emissions limit in units of lbs/hr.

Emissions (lbs/hr) = F x Incinerator Capacity (tons/hr)

Emissions = 5.43 x 0.334 tons/hr

Emissions = 1.81 lbs/hr

So with an incinerator capacity of 668 lbs/hr, the thermal oxidizer's PM emission limit is 1.81 lbs/hr. In the application, you reported that the PTE for PM from the thermal oxidizer is 0.07 lbs/hr. The PTE for PM is significantly less than the 45CSR6 PM emission limit which is to be expected given that the thermal oxidizer is being used to combust waste gas.

Please let me know if you have any further questions.

- Sarah Barron

On Thu, Feb 8, 2024 at 3:17 PM Steeber, Jeff <Jeff.Steeber@williams.com> wrote:

> Good Afternoon Sarah,
>
> I believe I have the loading values for the thermal oxidizer.
>
> According to Zeeco's Guarantee (Streams 1-4) have a total lb/hr of 668.0 lb/hr (Streams 5 & 6 are not included they were included in the original proposal and never pursued design-wise)
>
> F Factor - 5.43 as the loading value is less than 15,000 lb/hr. – Although I'm having issues understanding the WV Incinerator Code Formula, as the units do not match?

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions.

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

Can you clarify, as they state to use incinerator capacity in tons/year but then have emissions in lb/hr? – This yields questionable results.

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Tuesday, February 6, 2024 7:35 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hi, Jeff.

Thanks for forwarding this to me. I've added the minimum operating temperature to the Title V permit with the requirement to operate the thermal oxidizer according to the manufacturer's specifications.

In addition to the loading values for the thermal oxidizer and flare, could you also let me know how the temperature and residence time of the thermal oxidizer are currently monitored? I think that monitoring language will need to be added to the permit for the operating specifications.

Thanks,

- Sarah

On Wed, Jan 31, 2024 at 11:06 AM Steeber, Jeff <Jeff.Steeber@williams.com> wrote:

> Hi Sarah,
>
> Find Zeecos Guarantee letter for Pioneer – will provide loading values shortly.
>
> ---
>
> **From:** Sree Krishnan <Sree_Krishnan@zeeco.com>
> **Sent:** Tuesday, January 30, 2024 11:29 AM
> **To:** Steeber, Jeff <Jeff.Steeber@Williams.com>
> **Cc:** Sydney Levine <Sydney_Levine@zeeco.com>; Tom Owoc <Tom_Owoc@zeeco.com>
> **Subject:** RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477
>
> Morning, Jeff!
>
> Here is the Emissions Guarantee Letter for the Pioneer TO Package – take a look and let me know if you have any questions.
>
> Feel free to give me a call if you need anything else on my end – thanks again for your patience and support!
>
> Regards,
>
> ---
>
> **Sree Krishnan** | Applications Engineer - Thermal Oxidizers & Combustion Systems
>
> | Desk: +1 918 893 8606 | Cell: +1 918 815 8894
>
> ZEECO REDEFINING [COMBUSTION]
>
> ---
>
> **From:** Steeber, Jeff <Jeff.Steeber@Williams.com>
> **Sent:** Monday, January 22, 2024 7:46 AM

To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

!!

Hi Sree,

Glad the holidays went well! I understand. After speaking with WVDAQ, they request that we submit by the end of the month (1/31) at the latest.

Let me know if you have any questions or concerns, I appreciate the support.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Thursday, January 18, 2024 3:57 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hey, Jeff!

The holidays were chaotic but good – I hope you enjoyed them as well!

To be honest, I haven't had a *single* opportunity to work on the Pioneer Guarantee Letter since our last conversation in December – it has been crazy at work for the past several months and it still hasn't let up.

Is there any way you could buy me some more time to get this done for you? The Letter shouldn't take too long for me to complete – just haven't been able to carve out some time to get it done. If you could give me until the end of the month, I'd really appreciate it – let me know if that's too late and I'll do my best to accommodate.

Thanks again for your patience!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Wednesday, January 17, 2024 8:03 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

Hi Sree,

Hope you had a great holiday, just wanted to check in on the status of the TO guarantee letter.

Thanks,

Jeff

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, December 15, 2023 11:15 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Thanks again for taking my call this morning – it was good to hear from you!

Based on my preliminary review of the attached compositions, I still believe that the Pioneer TO will only be able to achieve a 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

As we discussed, the attached compositions are pretty similar to what the unit was originally designed for – there are slight variances, but the major constituents for each Stream are pretty consistent with what we recently evaluated. Drastic changes in flow would definitely have an impact on Destruction Efficiency, but that isn't the case here – we

are considering the same flows of the Flash Gas and Still Vent Wastes (*Wastes 1-4*) as the original design, and the flow of Wastes 5-6 (*going through the N5 nozzle on the Burner*) are not significant (*large*) enough to have a major impact on the unit's overall Destruction Efficiency.

Please share this information with your Environmental Team and let me know if they have any other questions. I will definitely send you guys an updated guarantee letter, but please give me some more time to put it together – I should be able to get it to you after the new year.

Feel free to give me a call if you need anything else in the meantime – thanks again for all of your patience and support thus far!

Have a very Merry Christmas and Happy New Year!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

PLEASE NOTE THAT THE ZEECO HEADQUARTERS OFFICE WILL BE CLOSED BETWEEN MONDAY, DECEMBER 25TH, 2023 AND MONDAY, JANUARY 1ST, 2024 IN OBSERVANCE OF THE CHRISTMAS AND NEW YEAR HOLIDAYS IN THE UNITED STATES. NORMAL BUSINESS HOURS WILL RESUME AT 8:00 AM ON TUESDAY, JANUARY 2ND, 2024.

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, December 14, 2023 8:52 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

No worries, sounds like a plan.

Thank you.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Thursday, December 14, 2023 9:35 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: Re: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Apologies for the delay - it has been crazy over the past few months.

I will give you a call tomorrow to discuss - may be able to get you some preliminary info quickly.

Again - so sorry for the delay.

Regards,

Sree Krishnan | *Applications Engineer, Thermal Oxidizers & Combustion Systems*
Zeeco World Headquarters | 22151 East 91st Street | Broken Arrow, Oklahoma 74014, USA
Main: +1 918 258 8551 | Direct: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, December 14, 2023 3:23:50 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: FW: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

Hi All,

WVDAQ had some questions about the maximum incinerator capacity for our flare and thermal oxidizer at Pioneer Compressor Station, are you able to provide any insight into this?

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Wednesday, December 13, 2023 11:15 AM

To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hi, Jeff.

I just wanted to check in again to see if you have any further information for the operating specifications of the thermal oxidizer?

Additionally, regarding the maximum incinerator capacity of the flare and the thermal oxidizer, it appears that the values that you reported (0.06 lbs/hr for the flare; 0.07 lbs/hr for the thermal oxidizer) are the controlled potential emissions of particulate matter from each of the control devices. Rather than the potential emissions from the devices, the maximum incinerator capacity refers to the maximum rate (lbs/hr) at which the gas/waste gas is loaded into the flare/thermal oxidizer. The incinerator capacity is then used to determine a limit for particulate matter emissions based on the equation in 45CSR§6-4.1. Could you send these rates for the flare and for the thermal oxidizer at the Pioneer Compressor Station?

Thanks,

- Sarah

From: Steeber, Jeff Jeff.Steeber@Williams.com
Sent: Thursday, December 7, 2023 8:54 AM
To: Sree Krishnan Sree_Krishnan@zeeco.com
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Good Morning Sree,

I wanted to check in on the process of this request.

Thanks for the support.

Jeff

From: Steeber, Jeff
Sent: Wednesday, November 15, 2023 3:37 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Hi Sree,

Find an updated Flash/Still composition attached for Pioneer, I've also included a recent fuel gas analysis.

Still working on Blakes information.

Let me know if you have any questions or concerns.

Thanks,

Jeff

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Tuesday, October 31, 2023 10:22 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

No problem, Sir!

Let me know when you have the updated compositions available and I would be happy to take another look for you.

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Monday, October 30, 2023 1:58 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Hi Sree,

Still working on getting an updated composition, will follow up this week.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, October 20, 2023 5:23 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Sounds good, Jeff!

More than happy to jump on a call, if you think it would be helpful.

I look forward to hearing from you soon – have a good weekend!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Friday, October 20, 2023 12:11 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Good Afternoon, Sree,

I'm going to set up a brief call with our facility engineer next week to discuss this further. I want to make sure we are using the most up-to-date gas composition to represent our most current operating practice.

Let me know If you have any questions and be on the lookout for an invite shortly.

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: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, October 20, 2023 12:10 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Good morning, Jeff!

Based on my calculations, the Pioneer and Blake TOs will be able to achieve the 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

I can send you the guarantee letters for both Units based on this temperature – will that work for you?

Feel free to give me a call if you'd like to discuss path forward in more detail – I look forward to hearing from you soon!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, October 12, 2023 8:01 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Sounds Good, Thank you!

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Wednesday, October 11, 2023 4:51 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Thanks for confirming, Jeff!

It will take me some time to prepare the Guarantee Letters for the Pioneer and Blake TOs, but I should be able to have them ready for you in a couple weeks.

Let me know if you have any issues with this timeline and I will do my best to work around your schedule!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Wednesday, October 11, 2023 11:06 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

If you are able to provide a demonstration for Blake as well, it may save time in the long run if this request comes up again.

I appreciate it, please let me know if you need further information.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Wednesday, October 11, 2023 12:00 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Good morning, Jeff!

Sure – I should be able to put together a similar "*VOC Destruction Efficiency Guarantee Letter*" for the unit at an operating temperature of 1,400°F (*minimum*).

Just to confirm – you only need a Letter for the HTO at the Pioneer Compressor Station, right (*WPO 667250 / Zeeco SO 32477*)? I only ask because our quote was for the units that were supplied to both the Blake and Pioneer Facilities.

Let me know if my understanding is correct!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

REDEFINING [COMBUSTION]

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Tuesday, October 10, 2023 12:56 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency

!!

Good Afternoon Sreeram,

Williams Appalachia Midstream has recently submitted an initial Title V Permit Application, for our Pioneer Compressor Station located in Brooke County WV. This facility includes a Zeeco Z-HTO Thermal Oxidizer and a Zeeco MJ-16 Elevated Flare. Upon our submittal to the agency, WVDAQ has requested the minimum VOC Destruction Efficiency in reference to our Thermal Oxidizer. This has similarly been requested recently at Mountaineer (Attached), as you assisted Peter Merranko with the department's request.

Specifically: *"What is the minimum operating temperature necessary for the thermal oxidizer to achieve the required 99.5% control efficiency for VOCs? Sections 4.4 and 5.0 of the proposal reference an operating temperature of 1,800°F. Is this the minimum operating temperature?"* - Currently we are operating the TO in the range of 1400 to 1800, being low and high setpoints.

Would you be able to provide a Zeeco minimum VOC Destruction Efficiency guarantee for the Thermal Oxidizer? – I have attached the initial Zeeco Proposal No. 2017-02645IN-01 Rev 4. (Note: Waste Streams 4 and 5 have not been installed)

Please let me know if you have any questions or concerns regarding this request.

Thanks,

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>

FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Barron, Sarah K <sarah.k.barron@wv.gov> Thu, Feb 8, 2024 at 5:30 PM
To: Jeff.Steeber@williams.com

Hi, Jeff.

The factor F was established when 45CSR6 was written and likely accounts for the unit change. The incinerator capacity is meant to be in units of lbs/hr when determining the value of the factor F and in units of tons/hr when substituted into the formula. The product of the factor and the incinerator capacity then yields the allowable PM emissions limit in units of lbs/hr.

So if the thermal oxidizer's incinerator capacity is 668 lbs/hr:

- As you stated in your message, the factor F would be 5.43 because 668 lbs/hr < 15,000 lbs/hr.
- The incinerator capacity of 668 lbs/hr would then be converted to units of tons/hr, or 0.334 tons/hr.
- The product of this incinerator capacity (0.334 tons/hr) and the applicable factor F (5.43) then yields the particulate matter emissions limit in units of lbs/hr.

  Emissions (lbs/hr) = F x Incinerator Capacity (tons/hr)

  Emissions = 5.43 x 0.334 tons/hr

  Emissions = 1.81 lbs/hr

So with an incinerator capacity of 668 lbs/hr, the thermal oxidizer's PM emission limit is 1.81 lbs/hr. In the application, you reported that the PTE for PM from the thermal oxidizer is 0.07 lbs/hr. The PTE for PM is significantly less than the 45CSR6 PM emission limit which is to be expected given that the thermal oxidizer is being used to combust waste gas.

Please let me know if you have any further questions.

- Sarah Barron

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> > [Quoted text hidden]
> > **Subject:** [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency
> >
> > !!
> >
> > Good Afternoon Sreeram,
> >
> > Williams Appalachia Midstream has recently submitted an initial Title V Permit Application, for our Pioneer Compressor Station located in Brooke County WV. This facility includes a Zeeco Z-HTO Thermal Oxidizer and a

Zeeco MJ-16 Elevated Flare. Upon our submittal to the agency, WVDAQ has requested the minimum VOC Destruction Efficiency in reference to our Thermal Oxidizer. This has similarly been requested recently at Mountaineer (Attached), as you assisted Peter Merranko with the department's request.

Specifically: *"What is the minimum operating temperature necessary for the thermal oxidizer to achieve the required 99.5% control efficiency for VOCs? Sections 4.4 and 5.0 of the proposal reference an operating temperature of 1,800°F. Is this the minimum operating temperature?"* - Currently we are operating the TO in the range of 1400 to 1800, being low and high setpoints.

Would you be able to provide a Zeeco minimum VOC Destruction Efficiency guarantee for the Thermal Oxidizer? – I have attached the initial Zeeco Proposal No. 2017-02645IN-01 Rev 4. (Note: Waste Streams 4 and 5 have not been installed)

Please let me know if you have any questions or concerns regarding this request.

Thanks,

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

[Quoted text hidden]

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

FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Steeber, Jeff <Jeff.Steeber@williams.com> Thu, Feb 8, 2024 at 3:16 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Good Afternoon Sarah,

I believe I have the loading values for the thermal oxidizer.

According to Zeeco's Guarantee (Streams 1-4) have a total lb/hr of 668.0 lb/hr (Streams 5 & 6 are not included they were included in the original proposal and never pursued design-wise)

F Factor - 5.43 as the loading value is less than 15,000 lb/hr. – Although I'm having issues understanding the WV Incinerator Code Formula, as the units do not match?

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions.

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

Can you clarify, as they state to use incinerator capacity in tons/year but then have emissions in lb/hr? – This yields questionable results.

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Tuesday, February 6, 2024 7:35 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hi, Jeff.

Thanks for forwarding this to me. I've added the minimum operating temperature to the Title V permit with the requirement to operate the thermal oxidizer according to the manufacturer's specifications.

In addition to the loading values for the thermal oxidizer and flare, could you also let me know how the temperature and residence time of the thermal oxidizer are currently monitored? I think that monitoring language will need to be added to the permit for the operating specifications.

Thanks,

- Sarah

On Wed, Jan 31, 2024 at 11:06 AM Steeber, Jeff <Jeff.Steeber@williams.com> wrote:

> Hi Sarah,
>
> Find Zeecos Guarantee letter for Pioneer – will provide loading values shortly.
>
> ---
>
> **From:** Sree Krishnan <Sree_Krishnan@zeeco.com>
> **Sent:** Tuesday, January 30, 2024 11:29 AM
> **To:** Steeber, Jeff <Jeff.Steeber@Williams.com>
> **Cc:** Sydney Levine <Sydney_Levine@zeeco.com>; Tom Owoc <Tom_Owoc@zeeco.com>
> **Subject:** RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477
>
> Morning, Jeff!
>
> Here is the Emissions Guarantee Letter for the Pioneer TO Package – take a look and let me know if you have any questions.

Feel free to give me a call if you need anything else on my end – thanks again for your patience and support!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Monday, January 22, 2024 7:46 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

!!

Hi Sree,

Glad the holidays went well! I understand. After speaking with WVDAQ, they request that we submit by the end of the month (1/31) at the latest.

Let me know if you have any questions or concerns, I appreciate the support.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Thursday, January 18, 2024 3:57 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hey, Jeff!

The holidays were chaotic but good – I hope you enjoyed them as well!

To be honest, I haven't had a *single* opportunity to work on the Pioneer Guarantee Letter since our last conversation in December – it has been crazy at work for the past several months and it still hasn't let up.

Is there any way you could buy me some more time to get this done for you? The Letter shouldn't take too long for me to complete – just haven't been able to carve out some time to get it done. If you could give me until the end of the month, I'd really appreciate it – let me know if that's too late and I'll do my best to accommodate.

Thanks again for your patience!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Wednesday, January 17, 2024 8:03 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

Hi Sree,

Hope you had a great holiday, just wanted to check in on the status of the TO guarantee letter.

Thanks,

Jeff

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, December 15, 2023 11:15 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Thanks again for taking my call this morning – it was good to hear from you!

Based on my preliminary review of the attached compositions, I still believe that the Pioneer TO will only be able to achieve a 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

As we discussed, the attached compositions are pretty similar to what the unit was originally designed for – there are slight variances, but the major constituents for each Stream are pretty consistent with what we recently evaluated. Drastic changes in flow would definitely have an impact on Destruction Efficiency, but that isn't the case here – we are considering the same flows of the Flash Gas and Still Vent Wastes (*Wastes 1-4*) as the original design, and the flow of Wastes 5-6 (*going through the N5 nozzle on the Burner*) are not significant (*large*) enough to have a major impact on the unit's overall Destruction Efficiency.

Please share this information with your Environmental Team and let me know if they have any other questions. I will definitely send you guys an updated guarantee letter, but please give me some more time to put it together – I should be able to get it to you after the new year.

Feel free to give me a call if you need anything else in the meantime – thanks again for all of your patience and support thus far!

Have a very Merry Christmas and Happy New Year!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

PLEASE NOTE THAT THE ZEECO HEADQUARTERS OFFICE WILL BE CLOSED BETWEEN MONDAY, DECEMBER 25TH, 2023 AND MONDAY, JANUARY 1ST, 2024 IN OBSERVANCE OF THE CHRISTMAS AND NEW YEAR HOLIDAYS IN THE UNITED STATES. NORMAL BUSINESS HOURS WILL RESUME AT 8:00 AM ON TUESDAY, JANUARY 2ND, 2024.

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, December 14, 2023 8:52 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

No worries, sounds like a plan.

Thank you.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Thursday, December 14, 2023 9:35 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: Re: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Apologies for the delay - it has been crazy over the past few months.

I will give you a call tomorrow to discuss - may be able to get you some preliminary info quickly.

Again - so sorry for the delay.

Regards,

Sree Krishnan | *Applications Engineer, Thermal Oxidizers & Combustion Systems*
Zeeco World Headquarters | 22151 East 91st Street | Broken Arrow, Oklahoma 74014, USA
Main: +1 918 258 8551 | Direct: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, December 14, 2023 3:23:50 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: FW: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

Hi All,

WVDAQ had some questions about the maximum incinerator capacity for our flare and thermal oxidizer at Pioneer Compressor Station, are you able to provide any insight into this?

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Wednesday, December 13, 2023 11:15 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hi, Jeff.

I just wanted to check in again to see if you have any further information for the operating specifications of the thermal oxidizer?

Additionally, regarding the maximum incinerator capacity of the flare and the thermal oxidizer, it appears that the values that you reported (0.06 lbs/hr for the flare; 0.07 lbs/hr for the thermal oxidizer) are the controlled potential emissions of particulate matter from each of the control devices. Rather than the potential emissions from the devices, the maximum incinerator capacity refers to the maximum rate (lbs/hr) at which the gas/waste gas is loaded into the flare/thermal oxidizer. The incinerator capacity is then used to determine a limit for particulate matter emissions based on the equation in 45CSR§6-4.1. Could you send these rates for the flare and for the thermal oxidizer at the Pioneer Compressor Station?

Thanks,

- Sarah

From: Steeber, Jeff Jeff.Steeber@Williams.com
Sent: Thursday, December 7, 2023 8:54 AM
To: Sree Krishnan Sree_Krishnan@zeeco.com
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Good Morning Sree,

I wanted to check in on the process of this request.

Thanks for the support.

Jeff

From: Steeber, Jeff
Sent: Wednesday, November 15, 2023 3:37 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Hi Sree,

Find an updated Flash/Still composition attached for Pioneer, I've also included a recent fuel gas analysis.

Still working on Blakes information.

Let me know if you have any questions or concerns.

Thanks,

Jeff

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Tuesday, October 31, 2023 10:22 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

No problem, Sir!

Let me know when you have the updated compositions available and I would be happy to take another look for you.

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Monday, October 30, 2023 1:58 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Hi Sree,

Still working on getting an updated composition, will follow up this week.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, October 20, 2023 5:23 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>

Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Sounds good, Jeff!

More than happy to jump on a call, if you think it would be helpful.

I look forward to hearing from you soon – have a good weekend!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Friday, October 20, 2023 12:11 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Good Afternoon, Sree,

I'm going to set up a brief call with our facility engineer next week to discuss this further. I want to make sure we are using the most up-to-date gas composition to represent our most current operating practice.

Let me know If you have any questions and be on the lookout for an invite shortly.

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: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, October 20, 2023 12:10 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Good morning, Jeff!

Based on my calculations, the Pioneer and Blake TOs will be able to achieve the 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

I can send you the guarantee letters for both Units based on this temperature – will that work for you?

Feel free to give me a call if you'd like to discuss path forward in more detail – I look forward to hearing from you soon!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

ZEECO REDEFINING [COMBUSTION]

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, October 12, 2023 8:01 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Sounds Good, Thank you!

!!

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Wednesday, October 11, 2023 4:51 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Thanks for confirming, Jeff!

It will take me some time to prepare the Guarantee Letters for the Pioneer and Blake TOs, but I should be able to have them ready for you in a couple weeks.

Let me know if you have any issues with this timeline and I will do my best to work around your schedule!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

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From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Wednesday, October 11, 2023 11:06 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

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If you are able to provide a demonstration for Blake as well, it may save time in the long run if this request comes up again.

I appreciate it, please let me know if you need further information.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Wednesday, October 11, 2023 12:00 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Good morning, Jeff!

Sure – I should be able to put together a similar "*VOC Destruction Efficiency Guarantee Letter*" for the unit at an operating temperature of 1,400°F (*minimum*).

Just to confirm – you only need a Letter for the HTO at the Pioneer Compressor Station, right (*WPO 667250 / Zeeco SO 32477*)? I only ask because our quote was for the units that were supplied to both the Blake and Pioneer Facilities.

Let me know if my understanding is correct!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Tuesday, October 10, 2023 12:56 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency

!!

Good Afternoon Sreeram,

Williams Appalachia Midstream has recently submitted an initial Title V Permit Application, for our Pioneer Compressor Station located in Brooke County WV. This facility includes a Zeeco Z-HTO Thermal Oxidizer and a Zeeco MJ-16 Elevated Flare. Upon our submittal to the agency, WVDAQ has requested the minimum VOC Destruction Efficiency in

reference to our Thermal Oxidizer. This has similarly been requested recently at Mountaineer (Attached), as you assisted Peter Merranko with the department's request.

Specifically: *"What is the minimum operating temperature necessary for the thermal oxidizer to achieve the required 99.5% control efficiency for VOCs? Sections 4.4 and 5.0 of the proposal reference an operating temperature of 1,800°F. Is this the minimum operating temperature?"* - Currently we are operating the TO in the range of 1400 to 1800, being low and high setpoints.

Would you be able to provide a Zeeco minimum VOC Destruction Efficiency guarantee for the Thermal Oxidizer? – I have attached the initial Zeeco Proposal No. 2017-02645IN-01 Rev 4. (Note: Waste Streams 4 and 5 have not been installed)

Please let me know if you have any questions or concerns regarding this request.

Thanks,

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>

FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Barron, Sarah K <sarah.k.barron@wv.gov> Tue, Feb 6, 2024 at 7:35 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Hi, Jeff.

Thanks for forwarding this to me. I've added the minimum operating temperature to the Title V permit with the requirement to operate the thermal oxidizer according to the manufacturer's specifications.

In addition to the loading values for the thermal oxidizer and flare, could you also let me know how the temperature and residence time of the thermal oxidizer are currently monitored? I think that monitoring language will need to be added to the permit for the operating specifications.

Thanks,
- Sarah

[Quoted text hidden]

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

FW: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Steeber, Jeff <Jeff.Steeber@williams.com> Wed, Jan 31, 2024 at 11:05 AM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

Find Zeecos Guarantee letter for Pioneer – will provide loading values shortly.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Tuesday, January 30, 2024 11:29 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>; Tom Owoc <Tom_Owoc@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Morning, Jeff!

Here is the Emissions Guarantee Letter for the Pioneer TO Package – take a look and let me know if you have any questions.

Feel free to give me a call if you need anything else on my end – thanks again for your patience and support!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Monday, January 22, 2024 7:46 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

!!

Hi Sree,

Glad the holidays went well! I understand. After speaking with WVDAQ, they request that we submit by the end of the month (1/31) at the latest.

Let me know if you have any questions or concerns, I appreciate the support.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Thursday, January 18, 2024 3:57 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information / Application No. R30-06900143-2023 / Williams Pioneer CF // SO 32477

Hey, Jeff!

The holidays were chaotic but good – I hope you enjoyed them as well!

To be honest, I haven't had a *single* opportunity to work on the Pioneer Guarantee Letter since our last conversation in December – it has been crazy at work for the past several months and it still hasn't let up.

Is there any way you could buy me some more time to get this done for you? The Letter shouldn't take too long for me to complete – just haven't been able to carve out some time to get it done. If you could give me until the end of the month, I'd really appreciate it – let me know if that's too late and I'll do my best to accommodate.

Thanks again for your patience!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Wednesday, January 17, 2024 8:03 AM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

Hi Sree,

Hope you had a great holiday, just wanted to check in on the status of the TO guarantee letter.

Thanks,

Jeff

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, December 15, 2023 11:15 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Thanks again for taking my call this morning – it was good to hear from you!

Based on my preliminary review of the attached compositions, I still believe that the Pioneer TO will only be able to achieve a 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

As we discussed, the attached compositions are pretty similar to what the unit was originally designed for – there are slight variances, but the major constituents for each Stream are pretty consistent with what we recently evaluated. Drastic changes in flow would definitely have an impact on Destruction Efficiency, but that isn't the case here – we are

considering the same flows of the Flash Gas and Still Vent Wastes (*Wastes 1-4*) as the original design, and the flow of Wastes 5-6 (*going through the N5 nozzle on the Burner*) are not significant (*large*) enough to have a major impact on the unit's overall Destruction Efficiency.

Please share this information with your Environmental Team and let me know if they have any other questions. I will definitely send you guys an updated guarantee letter, but please give me some more time to put it together – I should be able to get it to you after the new year.

Feel free to give me a call if you need anything else in the meantime – thanks again for all of your patience and support thus far!

Have a very Merry Christmas and Happy New Year!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

PLEASE NOTE THAT THE ZEECO HEADQUARTERS OFFICE WILL BE CLOSED BETWEEN MONDAY, DECEMBER 25TH, 2023 AND MONDAY, JANUARY 1ST, 2024 IN OBSERVANCE OF THE CHRISTMAS AND NEW YEAR HOLIDAYS IN THE UNITED STATES. NORMAL BUSINESS HOURS WILL RESUME AT 8:00 AM ON TUESDAY, JANUARY 2ND, 2024.

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, December 14, 2023 8:52 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

No worries, sounds like a plan.

Thank you.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Thursday, December 14, 2023 9:35 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: Re: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Apologies for the delay - it has been crazy over the past few months.

I will give you a call tomorrow to discuss - may be able to get you some preliminary info quickly.

Again - so sorry for the delay.

Regards,

Sree Krishnan | *Applications Engineer, Thermal Oxidizers & Combustion Systems*
Zeeco World Headquarters | 22151 East 91st Street | Broken Arrow, Oklahoma 74014, USA
Main: +1 918 258 8551 | Direct: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Thursday, December 14, 2023 3:23:50 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: FW: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

!!

Hi All,

WVDAQ had some questions about the maximum incinerator capacity for our flare and thermal oxidizer at Pioneer Compressor Station, are you able to provide any insight into this?

Thanks,

Jeff

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Wednesday, December 13, 2023 11:15 AM

To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Subject: Re: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hi, Jeff.

I just wanted to check in again to see if you have any further information for the operating specifications of the thermal oxidizer?

Additionally, regarding the maximum incinerator capacity of the flare and the thermal oxidizer, it appears that the values that you reported (0.06 lbs/hr for the flare; 0.07 lbs/hr for the thermal oxidizer) are the controlled potential emissions of particulate matter from each of the control devices. Rather than the potential emissions from the devices, the maximum incinerator capacity refers to the maximum rate (lbs/hr) at which the gas/waste gas is loaded into the flare/thermal oxidizer. The incinerator capacity is then used to determine a limit for particulate matter emissions based on the equation in 45CSR§6-4.1. Could you send these rates for the flare and for the thermal oxidizer at the Pioneer Compressor Station?

Thanks,

- Sarah

From: Steeber, Jeff Jeff.Steeber@Williams.com
Sent: Thursday, December 7, 2023 8:54 AM
To: Sree Krishnan Sree_Krishnan@zeeco.com
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Good Morning Sree,

I wanted to check in on the process of this request.

Thanks for the support.

Jeff

From: Steeber, Jeff
Sent: Wednesday, November 15, 2023 3:37 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Hi Sree,

Find an updated Flash/Still composition attached for Pioneer, I've also included a recent fuel gas analysis.

Still working on Blakes information.

Let me know if you have any questions or concerns.

Thanks,

Jeff

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Tuesday, October 31, 2023 10:22 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

No problem, Sir!

Let me know when you have the updated compositions available and I would be happy to take another look for you.

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

From: Steeber, Jeff <Jeff.Steeber@Williams.com>
Sent: Monday, October 30, 2023 1:58 PM
To: Sree Krishnan <Sree_Krishnan@zeeco.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

!!

Hi Sree,

Still working on getting an updated composition, will follow up this week.

From: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, October 20, 2023 5:23 PM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency // SO 32477

Sounds good, Jeff!

More than happy to jump on a call, if you think it would be helpful.

I look forward to hearing from you soon – have a good weekend!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

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Good Afternoon, Sree,

I'm going to set up a brief call with our facility engineer next week to discuss this further. I want to make sure we are using the most up-to-date gas composition to represent our most current operating practice.

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Good morning, Jeff!

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I can send you the guarantee letters for both Units based on this temperature – will that work for you?

Feel free to give me a call if you'd like to discuss path forward in more detail – I look forward to hearing from you soon!

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ZEECO REDEFINING [COMBUSTION]

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Thanks for confirming, Jeff!

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Let me know if you have any issues with this timeline and I will do my best to work around your schedule!

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Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

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Sure – I should be able to put together a similar "*VOC Destruction Efficiency Guarantee Letter*" for the unit at an operating temperature of 1,400°F (*minimum*).

Just to confirm – you only need a Letter for the HTO at the Pioneer Compressor Station, right (*WPO 667250 / Zeeco SO 32477*)? I only ask because our quote was for the units that were supplied to both the Blake and Pioneer Facilities.

Let me know if my understanding is correct!

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Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

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Subject: [EXTERNAL] Williams AMS - Pioneer Compressor Station - Thermal Oxidizer Minimum VOC Destruction Efficiency

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Specifically: *"What is the minimum operating temperature necessary for the thermal oxidizer to achieve the required 99.5% control efficiency for VOCs? Sections 4.4 and 5.0 of the proposal reference an operating temperature of 1,800°F. Is this the minimum operating temperature?"* - Currently we are operating the TO in the range of 1400 to 1800, being low and high setpoints.

Would you be able to provide a Zeeco minimum VOC Destruction Efficiency guarantee for the Thermal Oxidizer? – I have attached the initial Zeeco Proposal No. 2017-02645IN-01 Rev 4. (Note: Waste Streams 4 and 5 have not been installed)

Please let me know if you have any questions or concerns regarding this request.

Thanks,

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

Zeeco Emissions Guarantee Letter_PO 667250_SO 32477_R0.pdf
198K

Zeeco, Inc.
22151 East 91st Street
Broken Arrow, OK 74014 USA

Tel: +1 918 258-8551
Fax: +1 918 251 5519
sales@zeeco.com
zeeco.com

DATE: January 30th, 2024

CUSTOMER: **Williams**
2000 Commerce Drive
Pittsburgh, PA 15275

ATTENTION: **Mr. Jeff Steeber**
Environmental Specialist
Email: Jeff.Steeber@Williams.com
Phone: +1 (304) 843-3125

REFERENCE: Williams Pioneer Thermal Oxidizer
Williams Purchase Order No: 667250
Zeeco Sales Order No: 32477

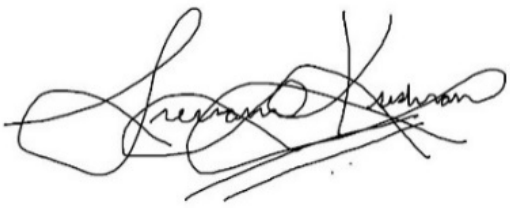
SUBJECT: Thermal Oxidizer Emissions Guarantee Letter

Dear Jeff,

This purpose of this letter is to confirm that the above referenced equipment supplied by Zeeco will provide a minimum VOC Destruction Efficiency of **99.5%** when operated and maintained per the operating and system design conditions noted within Attachment A below as well as the industry standards for this type of equipment.

If you would like to discuss this matter further, please feel free to call me at (918) 893-8606 or email me at sree_krishnan@zeeco.com.

Best Regards,



Sreeram “Sree” Krishnan
Applications Engineer - Thermal Oxidizers & Combustion Systems
Zeeco World Headquarters

ATTACHMENTS:
A. Thermal Oxidizer System Operating and Design Conditions

Zeeco, Inc.
22151 East 91st Street
Broken Arrow, OK 74014 USA

Tel: +1 918 258-8551
Fax: +1 918 251 5519
sales@zeeco.com
zeeco.com

ATTACHMENT A:
THERMAL OXIDIZER SYSTEM OPERATING AND DESIGN CONDITIONS

Zeeco, Inc.
22151 East 91st Street
Broken Arrow, OK 74014 USA

Tel: +1 918 258-8551
Fax: +1 918 251 5519
sales@zeeco.com
zeeco.com

1.0 System Operating Conditions and Design Criteria (*Reference Drawing 32477-G006A-001*)

2.0 Thermal Oxidizer Description

The Zeeco Standard Skidded Horizontal Thermal Oxidizer Package supplied under the reference Purchase Order / Sales Order has been designed to accommodate the following Site and Operating/Design Conditions, as previously stipulated by Williams.

3.0 DESIGN BASIS

3.1 Site Conditions

ITEM	UNITS	VALUE
Elevation	ft	1,250
Barometric Pressure	psia	13.9
Ambient Temperature (*Min/Max*)	°F	-20[1] / 104
Design Relative Humidity	%	90
Wind Design	-	ASCE 7-10, 120 mph

(1) Applicable to all items within the supplied Thermal Oxidizer Package, except for the HMI, which is guaranteed to 32°F

3.2 Fuel Gas Summary

ITEM	UNITS	FUEL GAS
Methane	mol %	71.6162
Ethane	mol %	17.0404
Propane (g)	mol %	6.6780
Butane-n (g)	mol %	2.1619
Butane-iso	mol %	0.6673
Pentane (gas)	mol %	0.5333
Nitrogen	mol %	0.4144
Isopentane (g)	mol %	0.3376
n-Hexane (g)	mol %	0.1126
Carbon dioxide	mol %	0.1098
n-Hexane (g)	mol %	0.0796
Methyl pentane	mol %	0.0736
n-Heptane (g)	mol %	0.0408
Methylhexane (2)	mol %	0.0237
Methylhexane (3)	mol %	0.0201
Methylcyclohexane	mol %	0.0185
Octane (g)	mol %	0.0102
Cyclohexane	mol %	0.0096
n-Heptane (g)	mol %	0.0091
Methyl heptane	mol %	0.0066
Methylcyclopentane	mol %	0.0050
Water (g)	mol %	0.0029
Ethyl pentane	mol %	0.0028
Nonane	mol %	0.0024
Toluene	mol %	0.0024
TOTAL	**mol %**	**99.9788**

MW	lb/lb-mol	22.38
LHV	Btu/SCF	1,217.56
Supply Temperature	°F	80.00

Zeeco, Inc.
22151 East 91st Street
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sales@zeeco.com
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3.3 Waste Stream Summary

ITEM	UNITS	WASTE GAS 1 & 2	WASTE GAS 3 & 4	WASTE GAS 3 & 4
Water	mol%	81.0034	0.1499	0.0000
TEG	mol%	0.0001	0.0001	0.0000
Oxygen	mol%	0.0000	0.0000	0.0000
Nitrogen	mol%	0.0007	0.0976	0.0000
Methane	mol%	1.5641	52.1447	0.0000
CO2	mol%	0.2111	0.6008	0.0000
Ethane	mol%	3.0488	25.4677	20.9861
Propane	mol%	3.1508	12.7276	11.1651
i-Butane	mol%	0.4200	1.2014	41.2659
n-Butane	mol%	2.3720	4.4424	6.8907
i-Pentane	mol%	0.6323	0.7169	10.9547
n-Pentane	mol%	1.3712	1.2600	2.4705
2,2-Dimethylbutane	mol%	0.0169	0.0132	1.5553
2,3-Dimethylbutane	mol%	0.3308	0.0683	1.7404
2-Methylpentane	mol%	0.3227	0.1967	0.0151
3-Methylpentane	mol%	0.2422	0.1190	0.1282
Hexane	mol%	0.7371	0.3447	0.0118
2,2-Dimethylpentane	mol%	0.0079	0.0034	0.0124
Methylcyclopentane	mol%	0.3752	0.0580	0.1671
Benzene	mol%	0.3930	0.0092	0.1272
3,3-Dimethylpentane	mol%	0.0077	0.0020	0.0152
Cyclohexane	mol%	0.3651	0.0515	0.4129
2-Methylhexane	mol%	0.1461	0.0457	0.8027
2,3-Dimethylpentane	mol%	0.0448	0.0106	0.0374
3-Methylhexane	mol%	0.2038	0.0511	0.1909
Heptane	mol%	0.1440	0.0137	0.0210
Toluene	mol%	0.0000	0.0000	0.0029
Octane	mol%	0.0237	0.0056	0.1766
Ethylbenzene	mol%	0.3832	0.0867	0.3790
o-Xylene	mol%	0.4280	0.0468	0.0391
2-Methylheptane	mol%	0.0211	0.0051	0.0109
1,t-2-Dimethylcyclopentane	mol%	0.0095	0.0019	0.0433
1,t-3Dimethylcyclopentane	mol%	0.0115	0.0019	5.70E-04
Methylcyclohexane	mol%	0.0078	0.0010	0.0076
2,5-Dimethylhexane	mol%	0.8249	0.0099	5.64E-05
2,3-Dimethylhexane	mol%	0.0113	0.0019	5.43E-06
4-Methylheptane	mol%	0.0281	0.0040	5.72E-07
3-Methylheptane	mol%	0.0845	0.0092	1.56E-07
1,t-4-Dimethylcyclohexane	mol%	0.0073	0.0014	1.24E-07
1,t-3-Dimethylcyclohexane	mol%	0.0234	0.0013	2.76E-08
2,4,4-Trimethylhexane	mol%	0.1006	0.0124	1.08E-08
2,6-Dimethylheptane	mol%	0.0142	0.0013	2.49E-09
Ethylcyclohexane	mol%	0.0200	0.0010	9.04E-10
Nonane	mol%	0.0291	0.0016	1.05E-09
Neopentane	mol%	0.0649	0.0005	8.08E-10
n-Undecane	mol%	0.6523	0.0046	4.00E-10
n-Decane	mol%	0.0560	0.0003	2.17E-11
Dodecane	mol%	0.0776	0.0050	0.0139
Tridecane	mol%	0.0091	0.0003	0.0102
Tetradecane	mol%	81.0034	0.1499	0.0369
Pentadecane	mol%	0.0001	0.0001	0.0055
Hexadecane	mol%	0.0000	0.0000	0.0571
Heptadecane	mol%	0.0007	0.0976	0.0382

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Octadecane	mol%	1.5641	52.1447	0.1352
Nonadecane	mol%	0.2111	0.6008	0.0511
Eicosane	mol%	3.0488	25.4677	0.0199
C21	mol%	3.1508	12.7276	0.0000
C22	mol%	0.4200	1.2014	0.0000
C23	mol%	2.3720	4.4424	0.0000
C24	mol%	0.6323	0.7169	0.0000
C25	mol%	1.3712	1.2600	0.0000
C26	mol%	0.0169	0.0132	0.0000
C27	mol%	0.3308	0.0683	20.9861
C28	mol%	0.3227	0.1967	11.1651
C29	mol%	0.2422	0.1190	41.2658
C30	mol%	0.7371	0.3447	6.8906
Carbon Monoxide	mol%	0.0079	0.0034	10.9547
m-Xylene	mol%	0.3752	0.0580	2.4705
p-Xylene	mol%	0.3930	0.0092	1.5553
2,2,4-Trimethylpentane	mol%	0.0077	0.0020	1.7404
2,4-Dimethylpentane	mol%	0.3651	0.0515	0.0151
3-Ethylpentane	mol%	0.1461	0.0457	0.1282
2,4-Dimethylhexane	mol%	0.0448	0.0106	0.0118
trans-1,2-Dimethylcyclohexane	mol%	0.2038	0.0511	0.0124
cis-1,2-Dimethylcyclohexane	mol%	0.1440	0.0137	0.1671
cis-1,3-Dimethylcyclohexane	mol%	0.0000	0.0000	0.1272
TOTAL	**mol%**	**100.0000**	**100.0000**	**100.0000**

MW	lb/lb-mol	25.58	27.70	59.59
LHV	Btu/SCF	549.08	1,474.58	3,066.99
Supply Pressure	psig	0.10	57.00	1.00
Supply Temperature	°F	205.00	108.00	100.00
Supply Flowrate[1]	lb/hr	460.00	208.00	**0.00**

(1) Combined Flowrate for both Waste Streams (*equally distributed*)

3.3.1 All Waste Streams are assumed to be in vapor phase, no liquid has been considered within this design. It has also been assumed that the Waste Streams noted within the above table will be continuously flowing to the Thermal Oxidizer in separate pipes, and that Waste Gasses 5 and 6 will no longer be sent to the Thermal Oxidizer, as previously indicated by the Buyer.

3.4 Flue Gas Summary @ 1,650°F Operating Temperature

ITEM	UNITS	WASTES 1,2,3,4,5 & 6	WASTES 2,3,4, & 6	WASTES 1,3,5 & 6	WASTES 1,3, & 6
CO_2	mol %	4.37	4.35	4.56	4.56
H_2O	mol %	11.48	11.01	11.78	11.78
N_2	mol %	72.31	72.79	72.22	72.22
O_2	mol %	11.84	11.85	11.44	11.44
TOTAL	**mol %**	**100.00**	**100.00**	**100.00**	**100.00**

MW	lb/lb-mol	28.04	28.08	28.02	28.02
Operating Temperature	°F	1,650.00	1,650.00	1,650.00	1,650.00
Total Flowrate	lb/hr	18,807.01	14,515.14	9,627.38	9,627.38

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3.5 Utility Summary

UTILITY	UNITS	AMOUNT REQUIRED
Electrical Power	V / Phase / Hz	460 / 3 / 60
Instrument Air Flowrate	SCFH	2,000
Fuel Gas Heat Release (*Min.*)	MMBtu/hr	1.0

3.6 System Performance

STACK PARAMETER	UNITS	GUARANTEED VALUE
VOC Destruction Efficiency	%	99.5

3.6.1 These values are understood to apply only when the system is operated in accordance with the operating conditions stipulated in this design summary and for the Fuel(s) and Waste(s) stipulated in the Design Basis section of this document. VOCs are defined as non-methane and non-ethane hydrocarbons.

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

Title V Permit - Request for Information; Application No. R30-06900143-2023

Barron, Sarah K <sarah.k.barron@wv.gov> Mon, Jan 22, 2024 at 7:37 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Jeff,

Thank you for the update. January 31st should be fine.

- Sarah
[Quoted text hidden]

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

Title V Permit - Request for Information; Application No. R30-06900143-2023

Steeber, Jeff <Jeff.Steeber@williams.com> Sun, Jan 21, 2024 at 8:45 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

Zeeco's Engineer informed me last week (1/18/2024) that they have been extremely busy and haven't had a chance to work on the Pioneer Guarantee Letter since our last conversation in December… They've requested additional time to complete it. Accordingly, I've requested that it be completed no later than January 31st, as It has been a few months since initial request. Please let me know if this revised timeline is feasible.

Similarly, I will get you the limits for particulate matter emissions early this week.

I apologize for the delay on these matters, please let me know if any of these will not meet your timeline.

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

[Quoted text hidden]

[Quoted text hidden]

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

Title V Permit - Request for Information; Application No. R30-06900143-2023

Barron, Sarah K <sarah.k.barron@wv.gov> Wed, Jan 17, 2024 at 7:12 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Hi, Jeff.

I'm hoping to soon send you a copy of the pre-draft permit and fact sheet for you to review. However, I still need the maximum incinerator capacity of the flare and of the thermal oxidizer to determine the 45CSR§6-4.1. limits for particulate matter emissions. Do you have any update for these rates?

I also wanted to check if there are any further updates for the thermal oxidizer's operating specifications?

Thanks,
- Sarah
[Quoted text hidden]

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

Title V Permit - Request for Information; Application No. R30-06900143-2023

Steeber, Jeff <Jeff.Steeber@williams.com> Sun, Dec 17, 2023 at 7:47 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Good Evening Sarah,

Based on Zeeco's review of the updated Pioneer compositions, they believe that the Pioneer TO will only be able to achieve a 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

Zeeco is working on a formalized guaranteed letter, and I will provide it as soon as I receive it.

Working with Zeeco for loading values – and should have an answer tomorrow.

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: Sree Krishnan <Sree_Krishnan@zeeco.com>
Sent: Friday, December 15, 2023 11:15 AM
To: Steeber, Jeff <Jeff.Steeber@Williams.com>
Cc: Tom Owoc <Tom_Owoc@zeeco.com>; Sydney Levine <Sydney_Levine@zeeco.com>
Subject: RE: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

Hey, Jeff.

Thanks again for taking my call this morning – it was good to hear from you!

Based on my preliminary review of the attached compositions, I still believe that the Pioneer TO will only be able to achieve a 99.5% VOC Destruction Efficiency at a minimum operating temperature of 1,650°F.

As we discussed, the attached compositions are pretty similar to what the unit was originally designed for – there are slight variances, but the major constituents for each Stream are pretty consistent with what we recently evaluated. Drastic

changes in flow would definitely have an impact on Destruction Efficiency, but that isn't the case here – we are considering the same flows of the Flash Gas and Still Vent Wastes (*Wastes 1-4*) as the original design, and the flow of Wastes 5-6 (*going through the N5 nozzle on the Burner*) are not significant (*large*) enough to have a major impact on the unit's overall Destruction Efficiency.

Please share this information with your Environmental Team and let me know if they have any other questions. I will definitely send you guys an updated guarantee letter, but please give me some more time to put it together – I should be able to get it to you after the new year.

Feel free to give me a call if you need anything else in the meantime – thanks again for all of your patience and support thus far!

Have a very Merry Christmas and Happy New Year!

Regards,

Sree Krishnan | Applications Engineer - Thermal Oxidizers & Combustion Systems

| Desk: +1 918 893 8606 | Cell: +1 918 815 8894

ZEECO REDEFINING [COMBUSTION]®

PLEASE NOTE THAT THE ZEECO HEADQUARTERS OFFICE WILL BE CLOSED BETWEEN MONDAY, DECEMBER 25TH, 2023 AND MONDAY, JANUARY 1ST, 2024 IN OBSERVANCE OF THE CHRISTMAS AND NEW YEAR HOLIDAYS IN THE UNITED STATES. NORMAL BUSINESS HOURS WILL RESUME AT 8:00 AM ON TUESDAY, JANUARY 2ND, 2024.

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

Title V Permit - Request for Information; Application No. R30-06900143-2023

Barron, Sarah K <sarah.k.barron@wv.gov> Wed, Dec 13, 2023 at 11:15 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Hi, Jeff.

I just wanted to check in again to see if you have any further information for the operating specifications of the thermal oxidizer?

Additionally, regarding the maximum incinerator capacity of the flare and the thermal oxidizer, it appears that the values that you reported (0.06 lbs/hr for the flare; 0.07 lbs/hr for the thermal oxidizer) are the controlled potential emissions of particulate matter from each of the control devices. Rather than the potential emissions from the devices, the maximum incinerator capacity refers to the maximum rate (lbs/hr) at which the gas/waste gas is loaded into the flare/thermal oxidizer. The incinerator capacity is then used to determine a limit for particulate matter emissions based on the equation in 45CSR§6-4.1. Could you send these rates for the flare and for the thermal oxidizer at the Pioneer Compressor Station?

Thanks,
- Sarah
[Quoted text hidden]

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

Title V Permit - Request for Information; Application No. R30-06900143-2023

Steeber, Jeff <Jeff.Steeber@williams.com> Wed, Nov 15, 2023 at 1:43 PM
To: "Barron, Sarah K" <sarah.k.barron@wv.gov>

Hi Sarah,

I received information required to prepare the Zeeco VOC Destruction Efficiency Guarantee from the Engineering Team today. I still need to work with Zeeco to finalize our guarantee with our updated vales but am aiming to have something submitted by end of week/early next week.

Thank you for the patience during this process, let me know if you have any further questions or concerns.

Thanks,

Jeff

[Quoted text hidden]

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

Title V Permit - Request for Information; Application No. R30-06900143-2023

Barron, Sarah K <sarah.k.barron@wv.gov> Wed, Nov 15, 2023 at 8:30 AM
To: "Steeber, Jeff" <Jeff.Steeber@williams.com>

Hi, Jeff.

I wanted to check in and see if you have received any updates about the operating specifications for the thermal oxidizer TO-01 at the Pioneer Compressor Station?

Thanks,
- Sarah
[Quoted text hidden]

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

Title V Permit - Request for Information; Application No. R30-06900143-2023

Steeber, Jeff <Jeff.Steeber@williams.com> Tue, Oct 17, 2023 at 11:59 AM
To: "sarah.k.barron@wv.gov" <sarah.k.barron@wv.gov>

Good Afternoon Sarah,

Just wanted to provide an update: Zeeco is currently working on a minimum VOC Destruction Efficiency guarantee for the Thermal Oxidizer, and I will provide once received.

Please reach out with any questions

Thanks,

Jeff

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

[Quoted text hidden]

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

Title V Permit - Request for Information; Application No. R30-06900143-2023

Steeber, Jeff <Jeff.Steeber@williams.com> Mon, Oct 9, 2023 at 3:46 PM
To: "sarah.k.barron@wv.gov" <sarah.k.barron@wv.gov>

Good Afternoon Sarah,

Peter has transitioned to another role with Williams, I now cover Pioneer.

Regarding your questions:

1. Yes, the Flare is used as a backup control device to the Vapor Recovery Unit, so I would agree with that being listed in the Emission Unit Table.

2. The maximum incinerator capacity for each unit is as follows:

- TO-01: 0.07 lb/hr (as detailed on page 107 of the TVOP Permit Application)
- FLR-01: 0.06 lb/hr (as detailed on page 108 of the TVOP Permit Application)

These values are referenced from the EPA AP-42 Table 1.4-2 titled “Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion” which is tailored to natural gas combustion.

3. I am currently working with the manufacturer to validate the minimum operating temperature and will follow back up.

Let me know If you have any further questions or concerns.

Thanks,

Jeff Steeber

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

From: Barron, Sarah K <sarah.k.barron@wv.gov>
Sent: Thursday, October 5, 2023 5:24 PM
To: Merranko, Peter <Peter.Merranko@williams.com>
Subject: [EXTERNAL] Title V Permit - Request for Information; Application No. R30-06900143-2023

[Quoted text hidden]

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

Title V Permit - Request for Information; Application No. R30-06900143-2023

Barron, Sarah K <sarah.k.barron@wv.gov> Thu, Oct 5, 2023 at 5:24 PM
To: peter.merranko@williams.com

Hello, Peter.

I have a few questions regarding the application for the Pioneer Compressor Station's initial Title V operating permit.

1. In the Emission Units table of the Title V permit, should the flare (FLR-01) be included as a backup control device to the vapor recovery unit (VRU-01) for the tanks/truck load-out?

2. The thermal oxidizer TO-01 and the flare FLR-01 are subject to the particulate matter emissions limit of 45CSR§6-4.1. Please send me the maximum incinerator capacity (lbs/hr) of each unit so that these limits can be included in the operating permit.

3. Condition 6.1.3.c. in R13-3491B contains a requirement that the thermal oxidizer should be operated according to the manufacturer's specifications for residence time and the minimum combustion chamber temperature. Recently in a Title V permit for another of Appalachia Midstream Services L.L.C.'s compressor stations, the EPA commented that the specific minimum operating temperature of the thermal oxidizer should be included. Similarly, the minimum operating temperature should be added to this requirement.

I saw that the manufacturer's proposal for the thermal oxidizer was included in Supplement S5 of the Title V application. The proposal states the operating conditions are included in the design summary, however, that section does not seem to be included in the proposal. What is the minimum operating temperature necessary for the thermal oxidizer to achieve the required 99.5% control efficiency for VOCs? Sections 4.4 and 5.0 of the proposal reference an operating temperature of 1,800°F. Is this the minimum operating temperature?

Additionally, specific monitoring requirements will also need to be included for the temperature and residence time of the thermal oxidizer. How is this thermal oxidizer currently monitored? Is there any issue with including a requirement to continuously monitor and record the combustion chamber temperature and residence time?

Please, let me know if you have any questions or would like to discuss these topics further.

Thanks,
- Sarah

--
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

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

Completeness Determination, Pioneer Compressor Station, Application No. R30-06900143-2023

3 messages

Barron, Sarah K <sarah.k.barron@wv.gov> Wed, May 31, 2023 at 12:15 PM
To: peter.merranko@williams.com, t.j.rinke@williams.com

Your Title V application for a permit to operate the above referenced facility was received by this Division on May 24, 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

Merranko, Peter <Peter.Merranko@williams.com> Wed, May 31, 2023 at 12:37 PM
To: "sarah.k.barron@wv.gov" <sarah.k.barron@wv.gov>

Your message

To: Merranko, Peter
Subject: [EXTERNAL] Completeness Determination, Pioneer Compressor Station, Application No. R30-06900143-2023
Sent: Wednesday, May 31, 2023 12:15:42 PM (UTC-05:00) Eastern Time (US & Canada)

was read on Wednesday, May 31, 2023 12:36:58 PM (UTC-05:00) Eastern Time (US & Canada).

Rinke, TJ <T.J.Rinke@williams.com> Wed, May 31, 2023 at 2:40 PM
To: "sarah.k.barron@wv.gov" <sarah.k.barron@wv.gov>

Your message

To: Rinke, TJ
Subject: [EXTERNAL] Completeness Determination, Pioneer Compressor Station, Application No. R30-06900143-2023
Sent: Wednesday, May 31, 2023 11:15:42 AM (UTC-06:00) Central Time (US & Canada)

was read on Wednesday, May 31, 2023 1:39:24 PM (UTC-06:00) Central Time (US & Canada).

Received
May 24, 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; Pioneer Compressor Station
[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): **069–00143**
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): **R13-3491B**

- 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: **Peter Merranko, Environmental Specialist**
    - Email: **Peter.Merranko@Williams.com**
    - Phone Number: **(304) 843-3162**
  - ☐ Consultant
    - Name:
    - Email:
    - Phone Number:

Appalachia Midstream Services, LLC
100 Teletech Drive, Suite 2
Moundsville, WV 26041-2352
Telephone: (304) 843-3100

May 24, 2023

Via e-mail to:
DEPAirQualityPermitting@wv.gov
Appalachia Midstream Services, LLC; Pioneer 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 Initial 45CSR30 Title V Operating Permit**
Appalachia Midstream Services, LLC
Pioneer Compressor Station
Plant ID No. 069-00143
Ohio County, West Virginia

Dear Ms. McCumbers:

Appalachia Midstream Services, LLC is submitting an Application for an Initial 45CSR30 Title V Operating Permit for the existing Pioneer Compressor Station located at 300 Elysian Lane (aka Harvey's Road), approximately 1.6 miles south of West Liberty, Wheeling, in Ohio County, West Virginia.

The facility receives natural gas from local production wells then compresses and dehydrates the gas for delivery to a gathering pipeline. Additionally, raw field condensate is received at the site, stabilized, and then sent offsite via tanker trucks or pipeline.

If you have any questions concerning this submittal, or need additional information, please contact me by telephone at (304) 843-3162 or by e-mail at Peter.Merranko@Williams.com.

Sincerely,

Peter Merranko

Peter Merranko
Environmental Specialist

Attachments:
Facility-Wide Potential to Emit (PTE)
Enclosures:
Title V Operating Permit Application – Checklist
Application for Initial Title V Operating Permit
Attachments A thru H
Supplements S1 thru S7

Appalachia Midstream Services, LLC

Pioneer Compressor Station

Application for Initial 45CSR30 Title V Operating Permit

Facility-Wide Potential to Emit (PTE) [Tons per Year]

Unit ID	Point ID	Unit Description	NOX	CO	VOC	HCHO	Total HAP	GHG (CO2e)
Pioneer Compressor Station - Point Source PTE								
CE-01	1E	Compressor Engine 01 - CAT G3616LE A4	20.66	10.87	18.87	1.86	3.06	25,351
CE-02	2E	Compressor Engine 02 - CAT G3616LE A4	20.66	10.87	18.87	1.86	3.06	25,351
CE-03	3E	Compressor Engine 03 - CAT G3616LE A4	20.66	10.87	18.87	1.86	3.06	25,351
CE-04	4E	Compressor Engine 04 - CAT G3616LE A4	20.66	10.87	18.87	1.86	3.06	25,351
CRP	5E	Compressor Rod Packing	---	---	25.07	---	1.02	1,330
CBD	6E	Compressor Blowdown (and Shutdown Tests)	---	---	3.79	---	0.15	203.24
STAB	25E	Condensate Stabilizer (Electric Heater)	---	---	0.63	---	0.01	2
DFT-01	7E	Dehydrator 01 - Flash Tank	---	---	1.01	---	0.03	24.00
DSV-01	8E	Dehydrator 01 - Still Vent	---	---	1.77	---	0.81	5.17
RBV-01	12E	Dehydrator 01 - Reboiler	0.86	0.72	0.05	6E-04	0.02	1,037
DFT-02	9E	Dehydrator 02 - Flash Tank	---	---	1.01	---	0.03	24.00
DSV-02	10E	Dehydrator 02 - Still Vent	---	---	1.77	---	0.81	5.17
RBV-02	13E	Dehydrator 02 - Reboiler	0.86	0.72	0.05	6E-04	0.02	1,037
T-01	15E	Storage Tank 01 - Stabilized Condensate	---	---	0.08	---	0.01	---
T-02	16E	Storage Tank 02 - Stabilized Condensate	---	---	0.08	---	0.01	---
T-03	17E	Storage Tank 03 - Stabilized Condensate	---	---	0.08	---	0.01	---
T-04	18E	Storage Tank 04 - Stabilized Condensate	---	---	0.08	---	0.01	---
T-05	19E	Storage Tank 05 - Stabilized Condensate	---	---	0.08	---	0.01	---
T-06	20E	Storage Tank 06 - Stabilized Condensate	---	---	0.08	---	0.01	---
T-07	21E	Storage Tank 07 - Produced Water	---	---	7E-04	---	1E-04	---
T-08	22E	Storage Tank 08 - Produced Water	---	---	7E-04	---	1E-04	---
TLO	23E	Truck Load-Out - Stabilized Condensate	---	---	7.32	---	1.15	---
		Truck Load-Out - Produced Water	---	---	0.07	---	0.01	---
PIG	24E	Pigging Operations (3 Receivers, 1 Launcher)	---	---	1.57	---	0.06	84.51
TO-01	11E	DFT/DSV Thermal Oxidizer (Combustion Only)	4.29	13.58	0.24	3E-03	0.08	5,158
FLR-01	14E	CBD/PIG Elevated Flare (Comb. Only)	3.44	10.86	0.19	3E-03	0.06	4,127
VRU	---	TK/TLO/STAB VRU (Electric Compressor)	Negligible Emissions from Totally Enclosed VRU					
		Total Point Source PTE:	**92.10**	**69.36**	**120.50**	**7.45**	**16.59**	**114,440**
		TVOP Threshold:	100	100	100	See Total		na
Pioneer Compressor Station - Fugitive Source PTE								
FUG-G	1F	Process Piping & Equipment Leaks - Gas	---	---	3.67	---	0.15	7.16
FUG-L	2F	Process Piping & Equipment Leaks - Light Oil	---	---	5.96	---	0.94	---
ECC	3F	Engine Crankcase (CE-01 thru -04)	0.23	1.51	0.64	0.12	0.15	282.35
		Total Fugitive Source PTE:	**0.23**	**1.51**	**10.27**	**0.12**	**1.24**	**289.51**
Pioneer Compressor Station - Total PTE								
		Total Facility-Wide PTE:	**92.33**	**70.87**	**130.77**	**7.56**	**17.83**	**114,730**
		TVOP Threshold:	See Point Sources			10	25	na

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).

Application for
Initial 45CSR30 Title V Operating Permit

For the:

Appalachia Midstream Services, LLC

Pioneer Compressor Station

NSR Permit No. R13-3491B - Issued 06/02/22

Plant ID No. 069-00143

Ohio 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

May 2023

Application for
Initial 45CSR30 Title V Operating Permit

Appalachia Midstream Services, LLC

Pioneer Compressor Station

Plant ID No. 069-00143
Ohio County, West Virginia

Table of Contents

Appalachia Midstream Services, LLC
Pioneer Compressor Station

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 Responsible Official
☐	Confidential Information submitted in accordance with 45CSR31 - **NOT APPLICABLE**

Application for
45CSR30 Title V Operating Permit (TVOP)

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):

Appalachia Midstream Services, LLC

2. Facility Name or Location:

Pioneer Compressor Station

3. DAQ Plant ID No.:

0 6 9 - 0 0 1 4 3

4. Federal Employer ID No. (FEIN):

2 6 - 3 6 7 8 9 7 2

5. Permit Application Type:

☑ **Initial Permit**
☐ Permit Renewal
☐ Update to Initial/Renewal Permit Application

When did operations commence? **2017**
What is the expiration date of the existing permit? **na**

6. Type of Business Entity:

☐ Corporation ☐ Government Agency ☑ **LLC**
☐ Partnership ☐ Limited Partnership

7. Is the Applicant the:

☐ Owner ☐ Operator ☑ **Both**

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

na

8. Number of On-site Employees:

Less than ten (10)

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) 843-3100	**(304) 843-3131**	

12. Facility Location					
Street:		**City:**		**County:**	
300 Elysian Ln (a.k.a. Harvey's Rd)		**West Liberty**		**Ohio**	
UTM Easting:	**534.794 km**	**UTM Northing:**	**4,443.746 km**	**Zone:** ☑ **17**	☐ 18

Directions:

From West Liberty:

1) Head west on Van Meter Way ~1.0 mi;
2) Turn left onto Weidman Run Rd / Bethany Rd ~1.7 mi;
3) Sharp right onto Elysian Ln (aka, Harvey's Rd) ~0.3 mi;
4) Destination is straight ahead.

From 1-70 in Wheeling:

1) Exit 1-70 to U.S 40 E ~0.3 mi;
2) Slight right onto National Rd (SR-88) ~0.4 mi;
3) Slight left to stay on SR-88 (Oglebay Rd) ~7.5 mi;
4) Turn right onto Bells Ln (CR-7/2) ~1.2 mi;
5) Turn right onto Weidman Run Rd (CR 7/3) ~0.4 mi;
6) Sharp right onto Elysian Ln (aka, Harvey's Rd) ~0.3 mi;
7) Destination is straight ahead

Portable Source?	☐ Yes	☑ **No**		
Is facility located w/in a nonattainment area? (https://www.epa.gov/green-book: Ohio Co, WV)	☐ 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
Telephone Number:	**Cell Number:**	
(918) 573-9968	na	
E-mail address:		
t.j.rinke@williams.com		
Environmental Contact:	**Title:**	
Peter Merranko	Environmental Specialist	
Street or P.O. Box:		
Appalachia Midstream Services, LLC 100 Teletech Drive, Suite 2		
City:	**State:**	**Zip:**
Moundsville	WV	26041
Telephone Number:	**Cell Number:**	
(304) 639-9076	na	
E-mail address:		
Peter.Merranko@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
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 - Please reference SUPPLEMENT 1 – Process Description

Appalachia Midstream Services, LLC (AMS) operates the Pioneer Compressor Station at 300 Elysian Ln (aka Harvey's Rd) (~1.6 Mi South of West Liberty), Wheeling, in Ohio Co, WV 26003.

The facility receives up to 250.0 MMscfd of natural gas from local production wells then compresses and dehydrates the gas for delivery to a gathering pipeline. Additionally, raw field condensate is received at the site, stabilized, and then sent offsite via tanker trucks.

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) (HH and ZZZZ)**	☐ Nonattainment NSR (45CSR19)
☑ **Section 111 NSPS (JJJJ and OOOOa)**	☐ Section 112(d) MACT Standard
☑ **Section 112(g) Case-by-case MACT (HH and ZZZZ)**	☐ 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**

19. Non Applicability Determinations

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

<u>Please reference Supplement S2 - Regulatory Discussion</u>

☑ **Permit Shield**

20. Facility-Wide Applicable Requirements - Please reference Supplement S2 - Regulatory Discussion

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) .

The applicable Title V Permit requirements are identical to the
WVDEP-DAQ New Source Review (NSR)
Construction Permit No. R13-3491B, issued June 01, 2022.
Also reference Supplement S3 - 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.)

The applicable Title V Permit requirements are identical to the
WVDEP-DAQ New Source Review (NSR)
Construction Permit No. R13-3491B, issued June 01, 2022.
Also reference Supplement S3 - 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)**

20. Facility-Wide Applicable Requirements - Please reference Supplement S2 - Regulatory Discussion

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)*.**

The applicable Title V Permit requirements are identical to the
WVDEP-DAQ New Source Review (NSR)
Construction Permit No. R13-3491B, issued June 01, 2022.
Also reference Supplement S3 - 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.)

The applicable Title V Permit requirements are identical to the
WVDEP-DAQ New Source Review (NSR)
Construction Permit No. R13-3491B, issued June 01, 2022.
Also reference Supplement S3 - 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)**
R13-3491B	**06/01/2022**	**na**

22. Inactive Permits/Obsolete Permit Conditions		
Permit Number	**Date of Issuance**	**Permit Condition Number**
R13-3491A		**Replaced w/ R-13 Class II Administrative Update**
G35-D127B		**Replaced w/ R-13 Construction Permit**

23. Facility-Wide Emissions Summary [Tons per Year] - Reference SUPPLEMENT 03 – Emission Calculations	
Criteria Pollutants	**Potential Emissions**
Carbon Monoxide (CO)	**70.87**
Nitrogen Oxides (NOX)	**92.33**
Lead (Pb)	**---**
Particulate Matter (PM2.5)[1]	**7.59**
Particulate Matter (PM10)[1]	**7.59**
Total Particulate Matter (TSP)	**7.59**
Sulfur Dioxide (SO2)	**0.46**
Volatile Organic Compounds (VOC)	**130.77**
Hazardous Air Pollutants[2]	**Potential Emissions**
Acetaldehyde	**2.08**
Acrolein	**1.28**
Benzene	**0.31**
Butadiene, 1,3-	**0.07**
Ethylbenzene	**0.41**
Fornaldehyde (HCHO	**7.56**
Hexane, n-	**2.90**
Methanol (MeOH)	**0.85**
Polycyclic Organic Matter (POM/PAH)	**0.09**
Toluene	**0.62**
TMP, 2,2,4- (i-Octane)	**0.26**
Xylenes	**1.32**
Other/Trace HAP*	**0.08**
TOTAL HAPs	**17.83**
Regulated Pollutants other than Criteria and HAP	**Potential Emissions**
Carbon Dioxide (CO_2)	**104,815**
Nitrous Oxide (N_2O)	**394.12**
Methane (CH_4)	**0.21**
CO_2 equivalent (CO_2e)	**114,730**

[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	4,200 gal	Negligible	Negligible	Negligible	Negligible
TK-10	Storage Tank - Used Oil	4,200 gal	Negligible	Negligible	Negligible	Negligible
TK-11	Storage Tank - Coolant	4,200 gal	---	---	---	---
TK-12	Storage Tank - Used Coolant	4,200 gal	Negligible	Negligible	Negligible	Negligible
TK-13	Storage Tank - Methanol Blend	500 gal	3E-03	24	3E-03	24
TK-14	Storage Tank - Methanol Blend	500 gal	3E-03	24	3E-03	24
TK-15	Storage Tank - Methanol Blend	500 gal	3E-03	24	3E-03	24
TK-16	Storage Tank - Methanol Blend	500 gal	3E-03	24	3E-03	24
TK-17	Storage Tank - Methanol Blend	500 gal	3E-03	24	3E-03	24
TK-18	Storage Tank - Methanol Blend	500 gal	3E-03	24	3E-03	24
TK-19	Storage Tank - Methanol Blend	500 gal	3E-03	24	3E-03	24
TK-20	Storage Tank - Methanol Blend	500 gal	3E-03	24	3E-03	24
TK-21	Storage Tank - Engine Oil	520 gal	Negligible	Negligible	Negligible	Negligible
TK-22	Storage Tank - Engine Oil	520 gal	Negligible	Negligible	Negligible	Negligible
TK-23	Storage Tank - Engine Oil	520 gal	Negligible	Negligible	Negligible	Negligible
TK-24	Storage Tank - Engine Oil	520 gal	Negligible	Negligible	Negligible	Negligible
TK-25	Storage Tank - Compressor Oil	520 gal	Negligible	Negligible	Negligible	Negligible
TK-26	Storage Tank - Compressor Oil	520 gal	Negligible	Negligible	Negligible	Negligible
TK-27	Storage Tank - Compressor Oil	520 gal	Negligible	Negligible	Negligible	Negligible
TK-28	Storage Tank - Compressor Oil	520 gal	Negligible	Negligible	Negligible	Negligible
TK-29	Storage Tank - Triethylene Glycol	1,000 gal	---	---	Negligible	Negligible
TK-30	Storage Tank - Defoamer	500 gal	---	---	---	---

☑	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**. **(Not Applicable)**

Section 6: Certification of Information

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

Note: This Certification must be signed by a responsible official 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 DE680755CD4A4F0... Signature Date: 5/23/2023 | 6:31 AM PDT

(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) **(Not Applicable/Deferred)**

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:**
  Appalachia Midstream Services, LLC
  Pioneer Compressor Station
  300 Elysian Ln (aka Harvey's Rd)
  (~1.6 Mi South of West Liberty)
  Wheeling, in Ohio Co, WV 26003

- **Latitude and Longitude:**
  DMS: 40° 8'35.0"N x -80°35'28.0"W
  DD: 40.14306°N x -80.59111°W

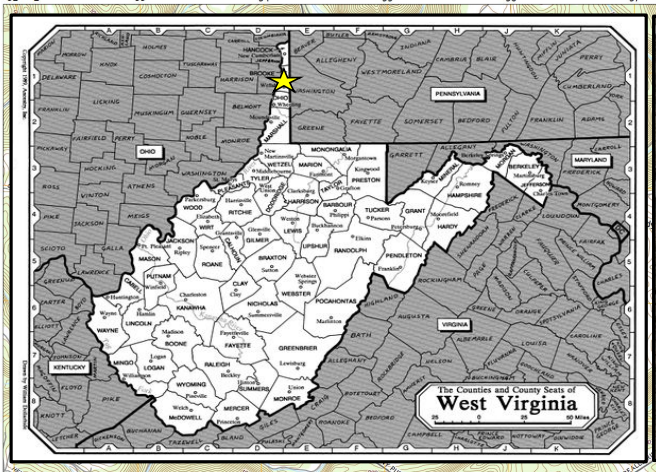
- **UTM:**
  534.830 km E x 4,443.715 km N x 17T

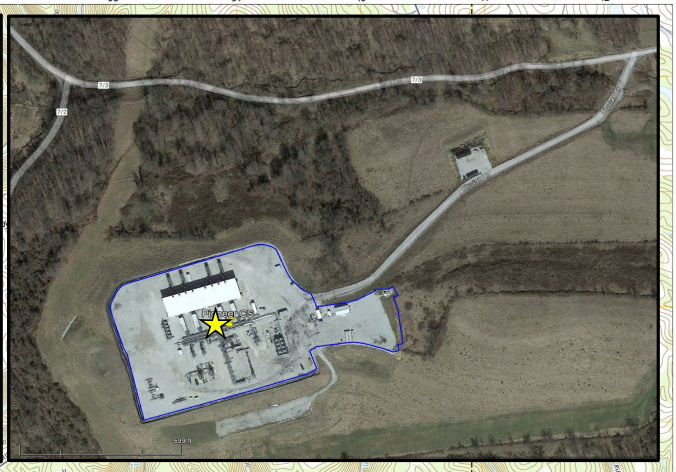
- **Elevation:**
  ~1,235'

- **USGS:**
  2019 USGS 7.5 Minute Topo - Bethany, WV-PA

- **Directions:**
  From West Liberty:
  1) Head west on Van Meter Way ~1.0 mi;
  2) Turn left onto Weidman Run Rd / Bethany Rd ~1.7 mi;
  3) Sharp right onto Elysian Ln (aka, Harvey's Rd) ~0.3 mi;
  4) Destination is straight ahead.

  From 1-70 in Wheeling:
  1) Exit 1-70 to U.S 40 E ~0.3 mi;
  2) Slight right onto National Rd (SR-88) ~0.4 mi;
  3) Slight left to stay on SR-88 ~7.5 mi;
  4) Turn right onto Bells Ln (CR-7/2) ~1.2 mi;
  5) Turn right onto Weidman Run Rd (CR 7/3) ~0.4 mi;
  6) Sharp right onto Elysian Ln (aka Harvey's Rd) ~0.3 mi;
  7) Destination is straight ahead.





Directions from **West Liberty**:
1) Head west on Van Meter Way ~1.0 mi;
2) Turn left onto Weidman Run Rd (aka Bethany Rd) ~1.7 mi;
3) Sharp right onto Elysian Ln (aka Harvey's Rd) ~0.3 mi;

Appalachia Midstream Services, LLC
Pioneer Compressor Station
~1.6 Mi South of West Liberty
300 Elysian Ln (aka Harvey's Rd)
Wheeling, in Ohio Co, WV 26003
Lat: 40°08'35.0"N Lon: -80°35'28.0"W
Lat: 40.14306°N Lon: -80.59111°W
UTM: 534.794 km E 4,443.830 km N 17T
USGS Topo: Bethany, WV-PA Quadrangle
7.5 Minute Series - 2019

Directions from 1-70 in **Wheeling**:
1) Exit 1-70 to U.S. 40 E ~0.3 mi;
2) Slight right onto National Rd (SR-88) ~0.4 mi;
3) Slight left to stay on SR-88 (Oglebay Dr) ~7.5 mi;
4) Turn right onto Bells Ln (CR-7/2) ~1.2 mi;
5) Turn right onto Weidman Run Rd (CR 7/3) ~0.4 mi;
6) Sharp right onto Elysian Ln (aka Harvey's Rd) ~0.3 mi;

~7.0 mi to Wheeling

Brooke County, WV
Ohio County, WV
West Liberty
Bethany
Frogtown
Donegal Bridge
Apple Pie Ridge
Welch Hollow
Tomac
Ohio County, WV
Washington County, PA

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 17T
This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.
Imagery.....HAIP, May 2017 - December 2017
Roads.....U.S. Census Bureau, 2016
Names.....GNIS, 1979 - 2019
Hydrography.....National Hydrography Dataset, 2002 - 2019
Contours.....National Elevation Dataset, 2006 - 2010
Boundaries.....Multiple sources; see metadata file 2017 - 2018
Wetlands.....FWS National Wetlands Inventory 1976 - 2014
UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011. A metadata file associated with this product is draft version 0.6.18
ADJOINING QUADRANGLES
1 Steubenville West
2 Steubenville East
3 Avella
4 Tiltonsville
5 West Middletown
6 Wheeling
7 Valley Grove
8 Claysville
ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route
BETHANY, WV, PA
2019

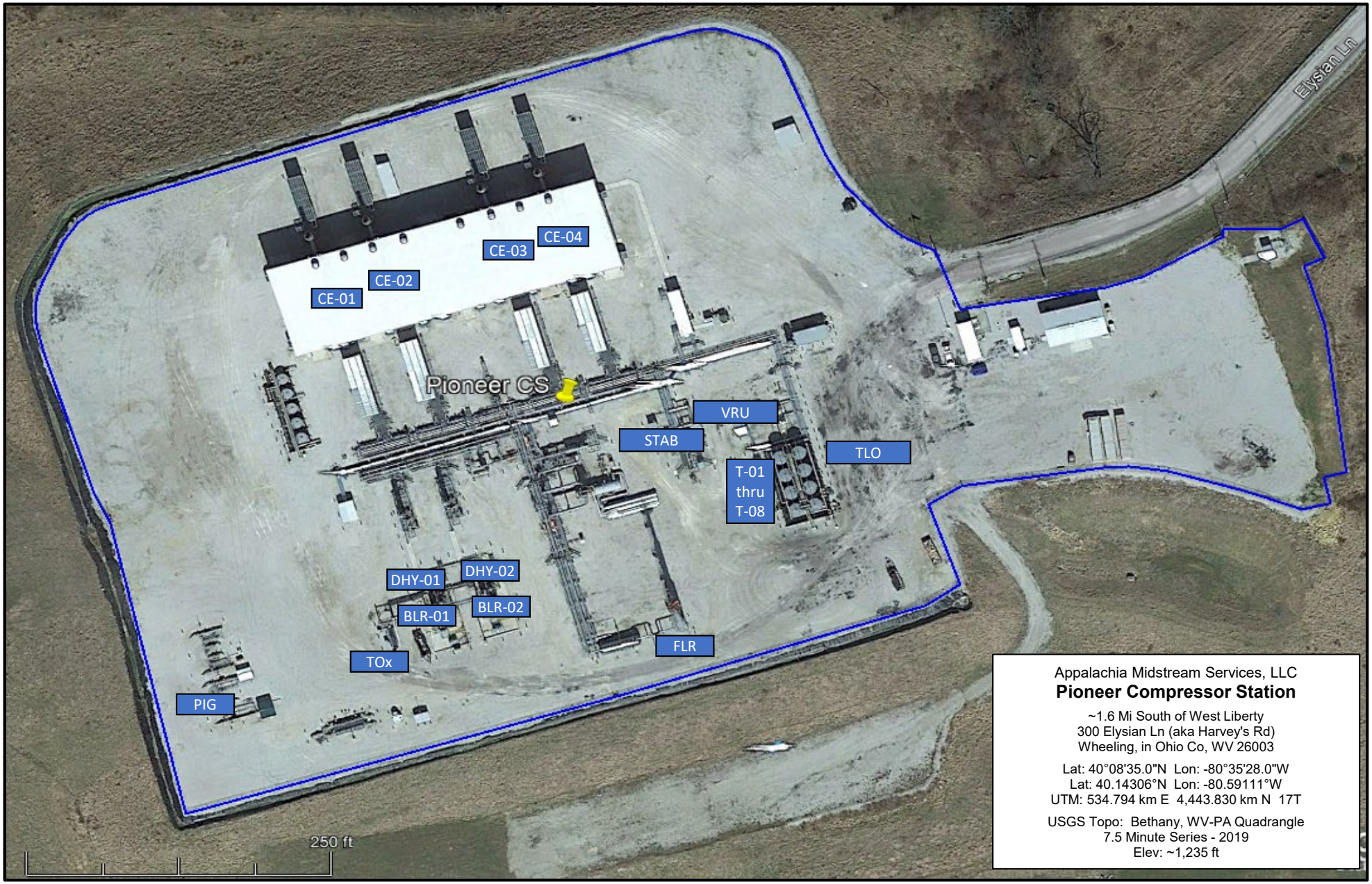
Attachment B

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**

Plot Plan


Elysian Ln
CE-01
CE-02
CE-03
CE-04
Pioneer CS
VRU
STAB
TLO
T-01
thru
T-08
DHY-01
DHY-02
BLR-01
BLR-02
FLR
TOx
PIG
250 ft
Appalachia Midstream Services, LLC
Pioneer Compressor Station
~1.6 Mi South of West Liberty
300 Elysian Ln (aka Harvey's Rd)
Wheeling, in Ohio Co, WV 26003
Lat: 40°08'35.0"N Lon: -80°35'28.0"W
Lat: 40.14306°N Lon: -80.59111°W
UTM: 534.794 km E 4,443.830 km N 17T
USGS Topo: Bethany, WV-PA Quadrangle
7.5 Minute Series - 2019
Elev: ~1,235 ft

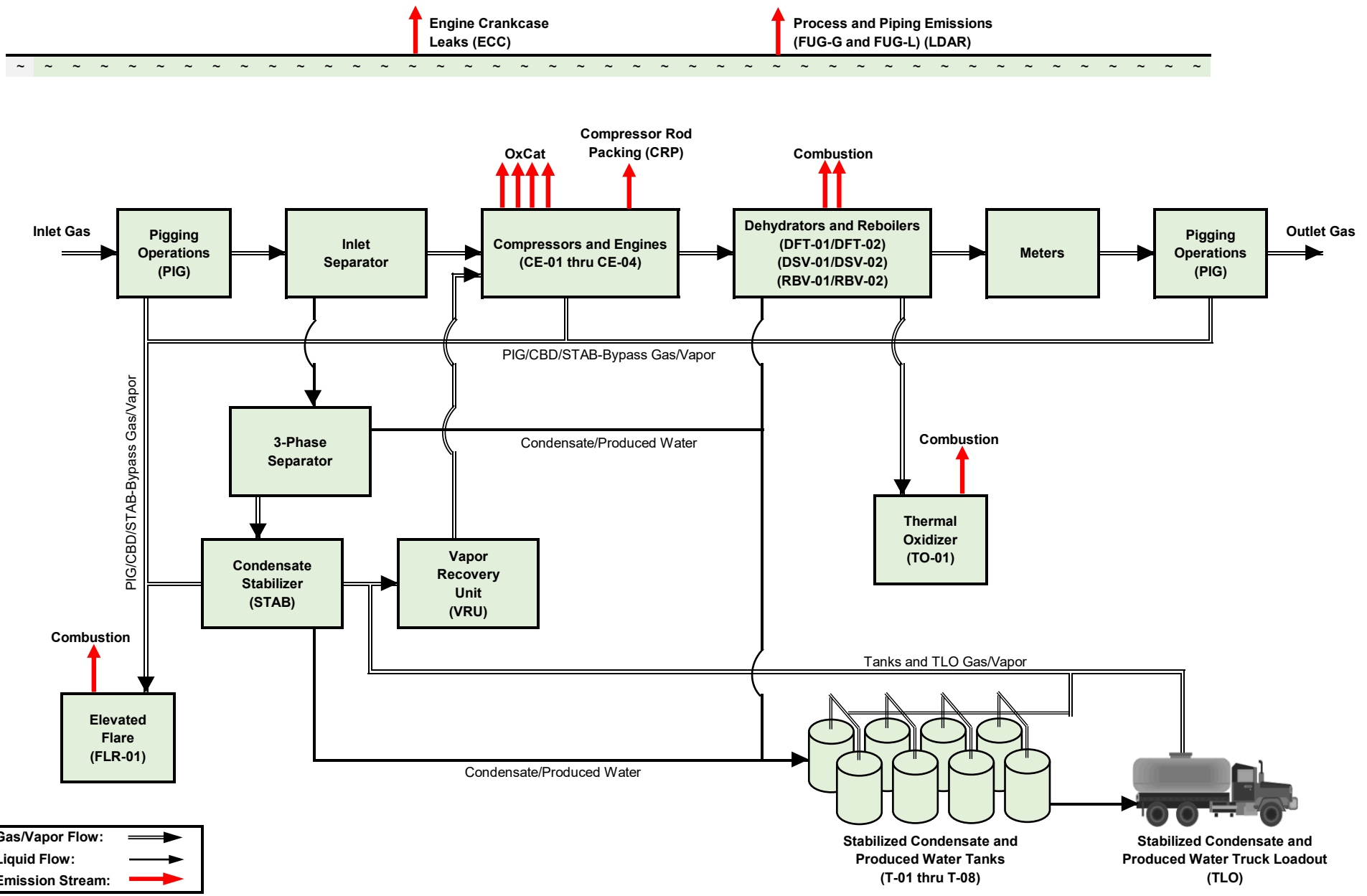
Attachment C

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)**

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**

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	Design Capacity	Year Installed/ Modified	Control Device[1]
CE-01	1E	Compressor Engine 01 - CAT G3616LE A4	5,350 bhp	2017/---	OxCat-01
CE-02	2E	Compressor Engine 02 - CAT G3616LE A4	5,350 bhp	2017/---	OxCat-02
CE-03	3E	Compressor Engine 03 - CAT G3616LE A4	5,350 bhp	2017/---	OxCat-03
CE-04	4E	Compressor Engine 04 - CAT G3616LE A4	5,350 bhp	2017/---	OxCat-04
CRP	5E	Compressor Rod Packing	5 Compr's	2017/2022	---
CBD	6E	Compressor Blowdown (and Shutdown Tests)	5 Compr's	2017/---	FLR-01
STAB	25E	Condensate Stabilizer (Electric Heater)	---	2017/---	FLR-01
DFT-01	7E	Dehydrator 01 - Flash Tank	125.0 MMscfd	2017/---	TO-01
DSV-01	8E	Dehydrator 01 - Still Vent			
RBV-01	12E	Dehydrator 01 - Reboiler	2.00 MMBtu/hr	2017/---	---
DFT-02	9E	Dehydrator 02 - Flash Tank	125.0 MMscfd	2017/---	TO-01
DSV-02	10E	Dehydrator 02 - Still Vent		2017/---	
RBV-02	13E	Dehydrator 02 - Reboiler	2.00 MMBtu/hr	2017/---	---
T-01	15E	Storage Tank 01 - Stabilized Condensate	400 bbl	2017/---	VRU-01
T-02	16E	Storage Tank 02 - Stabilized Condensate	400 bbl	2017/---	
T-03	17E	Storage Tank 03 - Stabilized Condensate	400 bbl	2017/---	
T-04	18E	Storage Tank 04 - Stabilized Condensate	400 bbl	2017/---	
T-05	19E	Storage Tank 05 - Stabilized Condensate	400 bbl	2017/---	
T-06	20E	Storage Tank 06 - Stabilized Condensate	400 bbl	2017/---	
T-07	21E	Storage Tank 07 - Produced Water	400 bbl	2017/---	
T-08	22E	Storage Tank 08 - Produced Water	400 bbl	2017/---	
TLO	23E	Truck Load-Out - Stabilized Condensate	168,000 bbl/yr	2017/---	VRU-01
		Truck Load-Out - Produced Water	30,000 bbl/yr	2017/---	
PIG	24E	Pigging Operations (3 Receivers, 1 Launcher)	1,772 events/yr	2017/---	FLR-01
TO-01	11E	DFT/DSV Thermal Oxidizer (Combustion Only)	10.00 MMBtu/hr	2017/---	---
FLR-01	14E	CBD/PIG Elevated Flare (Comb. Only)	8.00 MMBtu/hr	2017/2022	---
VRU	---	TK/TLO/STAB VRU (Electric Compressor)	---	2017/---	---
FUG-G	1F	Process Piping & Equipment Leaks - Gas	4,981 Fittings	2017/---	LDAR
FUG-L	2F	Process Piping & Equipment Leaks - Light Oil	2,271 Fittings		
ECC	3F	Engine Crankcase (CE-01 thru -04)	4 Engines	2017/---	---

[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)

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

- **5,350 bhp CAT G3616LE A4 Compressor Engines (CE-01/1E thru CE-04/4E)**
- **Compressor Rod Packing (CRP/5E)**
- **Compressor Blowdown (BD/6E)**
- **Condensate Stabilizer (STAB/25E)**
- **125.0 MMscfd Dehydrators (DFT-01/7E:DSV-01/8E and DFT-02/9E:DSV-02/10E)**
- **2.00 MMBtu/hr Dehydrator Reboiler (RBV-01/12E and RBV-02/13E)**
- **400 bbl (ea) Storage Tanks - Stabilized Condensate (SC) (TK-01/15E thru TK-06/20E)**
- **400 bbl (ea) Storage Tanks - Produced Water (PW) (TK-07/21E and TK-08/22E)**
- **Truck Load-Out - Stabilized Condensate (TLO/23E) and Produced Water (TLO/23E)**
- **Pigging Operations (3 Receivers, 1 Launcher) (PIG/24E)**
- **Thermal Oxidizer (TO-01/11E)**
- **Elevated Flare (FLR-01/14E)**
- **Process Piping and Equipment Leaks (FUG-G/1F and FUG-L/2F)**
- **Engine Crankcase (ECC/3F)**

Attachment E - Emission Unit Form

Emission Unit Description		CE-01 (1E) through CE-04 (4E)
Emission unit ID number: CE-01 (1E) through CE-04 (4E)	**Emission unit name:** Compressor Engine (Each of Four (4) Units)	**List any control devices associated with this emission unit:** OxCat-01 through OxCat-04

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Each of four (4) 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 are controlled by an oxidation catalyst (OxCat-01 through OxCat-04).

Manufacturer:	**Model number:**	**Serial number(s):**
Caterpillar (CAT)	G3616LE-A4	ZZY00742, ZZY00745, ZZY00748, ZZY00756
Construction date:	**Installation date:**	**Modification date(s):**
After 2012	2017	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

5,350 bhp

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
Natural Gas	
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
5,350 bhp	39.15 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 38,384 scf/hr 336.24 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-01 (1E) through CE-04 (4E)

Criteria Pollutants	Pollutant Emissions	
	PPH	TPY
Carbon Monoxide (CO)	2.48	10.87
Nitrogen Oxides (NOX)	4.72	20.66
Lead (Pb)	---	---
Particulate Matter (PM2.5)	0.39	1.71
Particulate Matter (PM10)	0.39	1.71
Total Particulate Matter (TSP)	0.39	1.71
Sulfur Dioxide (SO2)	0.02	0.10
Volatile Organic Compounds (VOC)	4.31	18.87

Hazardous Air Pollutants	Pollutant Emissions	
	PPH	TPY
Acetaldehyde	0.12	0.52
Acrolein	0.07	0.32
Benzene	0.01	0.03
Butadiene, 1,3-	4E-03	0.02
Ethylbenzene	6E-04	2E-03
Formaldehyde	0.42	1.86
Hexane, n-	0.02	0.07
Methanol	0.04	0.15
POM/PAH	0.01	0.02
Toluene	0.01	0.03
TMP, 2,2,4-	4E-03	0.02
Xylenes	3E-03	0.01
Other/Trace HAP	5E-03	0.02
Total HAP	0.70	3.06

Regulated Pollutants other than Criteria and HAP	Pollutant Emissions	
	PPH	TPY
Carbon Dioxide (CO2)	5,319	23,299
Methane (CH4) (GWP=25)	18.64	81.62
Nitrous Oxide (N2O) (GWP=298)	0.01	0.04
CO2 Equivalent (CO2e)	5,788	25,351

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, and HCO: 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-01 (1E) through CE-04 (4E)

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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

_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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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 (5E)
Emission unit ID number: CRP (5E)	**Emission unit name:** Compressor Rod Packing (Sum of Five (5) 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-01 (1E) through CE-04 (4E)) and the electric driven Vapor Recovery Unit (VRU).

Manufacturer:	**Model number:**	**Serial number(s):**
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2017	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		**CRP (5E)**
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)	**5.72**	**25.07**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**0.01**	**0.04**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**0.01**	**0.04**
Formaldehyde	**---**	**---**
Hexane, n-	**0.18**	**0.79**
Methanol	**0.01**	**0.04**
POM/PAH	**---**	**---**
Toluene	**0.01**	**0.04**
TMP, 2,2,4-	**0.01**	**0.04**
Xylenes	**0.01**	**0.04**
Other/Trace HAP	**---**	**---**
Total HAP	**0.23**	**1.02**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**0.07**	**0.31**
Methane (CH4) (GWP=25)	**12.15**	**53.20**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**303.71**	**1,330**

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 (5E)**

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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

_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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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		CBD (6E)
Emission unit ID number: CBD (6E)	**Emission unit name:** Compressor Blowdown and Emergency Shutdown Testing	**List any control devices associated with this emission unit:** FLR-01 (14E)

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, CBD). Additionally, there will be other infrequent emissions such as emergency shutdown (ESD) testing. Gas vapors from the Blowdown Operations are routed to a Flare (FLR-01).

Manufacturer:	Model number:	Serial number(s):
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2017	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		**CBD (6E)**
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)	**0.86**	**3.79**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**1E-03**	**0.01**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**1E-03**	**0.01**
Formaldehyde	**---**	**---**
Hexane, n-	**3E-02**	**0.12**
Methanol	**1E-03**	**0.01**
POM/PAH	**---**	**---**
Toluene	**1E-03**	**0.01**
TMP, 2,2,4-	**1E-03**	**0.01**
Xylenes	**1E-03**	**0.01**
Other/Trace HAP	**---**	**---**
Total HAP	**0.04**	**0.15**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**0.54**	**2.37**
Methane (CH4) (GWP=25)	**1.83**	**8.03**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**46.40**	**203.24**

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 **CBD (6E)**

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

Please Reference WVDEP-DAQ NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

Emissions from the ~~CRP~~, CBD, PIG, and STAB operations are shown as limitations from the Elevated Flare (FLR-01/14E); and include pilot gas, purge gas, and combustion gases.

10.1.5. Maximum emissions from the elevated flare (FLR-01) shall not exceed the following limits:

Pollutant	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	3.44
Carbon Monoxide	10.86
Volatile Organic Compounds	6.18

_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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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 (25E)**
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
STAB (25E)	**Condensate Stabilizer**	**FLR-01 (14E)**

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

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 elevated Flare (FLR-01 (14E)) 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	**2017**	**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		**STAB (25E)**
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)	**10.45**	**0.63**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**1E-03**	**9E-05**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**4E-03**	**2E-04**
Formaldehyde	**---**	**---**
Hexane, n-	**0.15**	**0.01**
Methanol	**1E-05**	**7E-07**
POM/PAH	**---**	**---**
Toluene	**0.01**	**4E-04**
TMP, 2,2,4-	**4E-03**	**3E-04**
Xylenes	**5E-03**	**3E-04**
Other/Trace HAP	**---**	**---**
Total HAP	**0.17**	**0.01**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**0.61**	**0.04**
Methane (CH4) (GWP=25)	**1.03**	**0.06**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**26.36**	**1.58**

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 **STAB (25E)**

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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

_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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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 (24E)
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
PIG (24E)	Pigging Operations Three (3) Recievers, One (1) Launcher	FLR-01 (14E)

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 and receiver for insertion and removal of the pig, respectively. Gas vapors from the pigging operations are routed to Flare (FLR-01) for 98% CH4, VOC and HAP destruction.

Manufacturer:	**Model number:**	**Serial number(s):**
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2017	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		**PIG (24E)**
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)	**0.36**	**1.57**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**6E-04**	**6E-04**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**6E-04**	**2E-03**
Formaldehyde	**---**	**---**
Hexane, n-	**1E-02**	**0.05**
Methanol	**6E-04**	**2E-03**
POM/PAH	**---**	**---**
Toluene	**6E-04**	**2E-03**
TMP, 2,2,4-	**6E-04**	**2E-03**
Xylenes	**6E-04**	**2E-03**
Other/Trace HAP	**---**	**---**
Total HAP	**0.01**	**0.06**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**0.23**	**0.99**
Methane (CH4) (GWP=25)	**0.76**	**3.34**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**19.30**	**84.51**

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 (24E)**

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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

10.1.5. Maximum emissions from the elevated flare (FLR-01) shall not exceed the following limits:

Pollutant	**Maximum Annual Emissions (ton/year)**
Nitrogen Oxides	3.44
Carbon Monoxide	10.86
Volatile Organic Compounds	6.18

_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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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		DFT-01/-02 (7E/9E) and DSV-01/-02 (8E/10E))
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
DFT-01/-02 (7E/9E) and DSV-01/-02 (8E/10E))	125.0 MMscfd TEG Dehydrator (Flash Tank (DFT) and Still Vent (DSV)	TO-01 (11E)

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Two (2) Triethylene Glycol (TEG) Dehydrators are utilized at the facility. Each dehydrator is comprised of a Contactor/Absorber Tower (no vented emissions), a Flash Tank (DFT), and a Regenerator/Still Vent (DSV).

Manufacturer:	**Model number:**	**Serial number(s):**
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2017	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

125.0 MMscfd (Each)

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
5.21 MMscf/hr (Each)	45,625 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.

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	**DFT-01/-02 (7E/9E) and DSV-01/-02 (8E/10E))**	
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)	**0.63**	**2.77**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**0.02**	**0.07**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**4E-03**	**0.02**
Formaldehyde	**---**	**---**
Hexane, n-	**0.02**	**0.11**
Methanol	**0.02**	**0.08**
POM/PAH	**---**	**---**
Toluene	**0.04**	**0.15**
TMP, 2,2,4-	**4E-03**	**0.02**
Xylenes	**0.09**	**0.40**
Other/Trace HAP	**---**	**---**
Total HAP	**0.19**	**0.84**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**2.16**	**9.47**
Methane (CH4) (GWP=25)	**0.18**	**0.79**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**6.66**	**29.17**

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

Please reference Supplement S3 - Emission Calculations
Also Supplement S6 - Emission Programs

Emission Unit Description **DFT-01/-02 (7E/9E) and DSV-01/-02 (8E/10E))**

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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

6.1.4. Emissions from the thermal oxidizer shall not exceed the following maximum hourly and annual emission limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	0.98	4.29
Carbon Monoxide	3.10	13.58
Volatile Organic Compounds	1.31	5.80
Total HAPs	0.42	1.76

_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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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		RBV-01/-02 (12E/13E)
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
RBV-01/-02 (12E/13E)	Dehydration Unit Reboiler	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 eqch Dehydrator's Regenerator/Still.

Manufacturer:	**Model number:**	**Serial number(s):**
na	na	BP12011806, 1805-309
Construction date:	**Installation date:**	**Modification date(s):**
na	2017	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

2.00 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:**
2.00 MMBtu/hr	2.00 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 17.18 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	RBV-01/-02 (12E/13E)	
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**0.16**	**0.72**
Nitrogen Oxides (NOX)	**0.20**	**0.86**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**0.01**	**0.07**
Particulate Matter (PM10)	**0.01**	**0.07**
Total Particulate Matter (TSP)	**0.01**	**0.07**
Sulfur Dioxide (SO2)	**0.00**	**0.01**
Volatile Organic Compounds (VOC)	**0.01**	**0.05**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**4E-06**	**2E-05**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**---**	**---**
Formaldehyde	**1E-04**	**6E-04**
Hexane, n-	**4E-03**	**0.02**
Methanol	**---**	**---**
POM/PAH	**1E-06**	**6E-06**
Toluene	**7E-06**	**3E-05**
TMP, 2,2,4-	**---**	**---**
Xylenes	**---**	**---**
Other/Trace HAP	**2E-06**	**1E-05**
Total HAP	**4E-03**	**0.02**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**235.29**	**1,031**
Methane (CH4) (GWP=25)	**5E-03**	**0.02**
Nitrous Oxide (N2O) (GWP=298)	**4E-03**	**0.02**
CO2 Equivalent (CO2e)	**236.69**	**1,037**

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 **RBV-01/-02 (12E/13E)**

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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

_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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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 (15E) thru TK-08 (22E)
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
TK-01 (15E) thru TK-08 (22E)	Six (6) Stabilized Condensate and Two (2) Produced Water Storage Tanks	VRU

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Six (6) 400 bbl storage tanks are used to hold the stabilized condensate from the stabilizer and two (2) 400 bbl storage tanks are used to hold the produced water from the inlet separator and the dehydrator. Gas vapors from these tanks are routed to a Vapor Recovery Unit (VRU) with a guaranteed control efficiency of 98%.

Manufacturer:	Model number:	Serial number(s):
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2017	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

3,200 bbl (Total)

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule:
22.60 bbl/hr (Total)	198,000 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 (15E) thru TK-08 (22E)

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)	**0.12**	**0.51**

Hazardous Air Pollutants	Pollutant Emissions	
	PPH	TPY
Acetaldehyde	---	---
Acrolein	---	---
Benzene	**1E-04**	**4E-04**
Butadiene, 1,3-	---	---
Ethylbenzene	**3E-03**	**0.01**
Formaldehyde	---	---
Hexane, n-	**0.01**	**0.04**
Methanol	---	---
POM/PAH	---	---
Toluene	**1E-03**	**0.01**
TMP, 2,2,4-	**9E-04**	**4E-03**
Xylenes	**3E-03**	**0.02**
Other/Trace HAP	---	---
Total HAP	**0.02**	**0.08**

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.).

AP-42

Please reference Supplement S3 - Emission Calculations

Emission Unit Description	TK-01 (15E) thru TK-08 (22E)

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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

_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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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		TLO (23E)
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
TLO (23E)	Stabilized Condensate and Produced Water Truck Load-Out	VRU

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Loading of stabilized condensate and produced water into tanker trucks occur at the facility. Gas vapors from these operations are routed to a Vapor Recovery Unit (VRU) with a guaranteed control efficiency of 98%.

Manufacturer:	**Model number:**	**Serial number(s):**
na	na	na
Construction date:	**Installation date:**	**Modification date(s):**
na	2017	na

Design Capacity (examples: furnaces - tons/hr, tanks – gallons, boilers – MMBtu/hr, engines - hp):

na

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
34.13 bbl/hr (Ave)	298,998 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		TLO (23E)
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	---	---
Nitrogen Oxides (NOX)	---	---
Lead (Pb)	---	---
Particulate Matter (PM2.5)	---	---
Particulate Matter (PM10)	---	---
Total Particulate Matter (TSP)	---	---
Sulfur Dioxide (SO2)	---	---
Volatile Organic Compounds (VOC)	**0.01**	**0.07**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	---	---
Acrolein	---	---
Benzene	**1E-03**	**0.01**
Butadiene, 1,3-	---	---
Ethylbenzene	**0.04**	**0.17**
Formaldehyde	---	---
Hexane, n-	**0.14**	**0.62**
Methanol	**1E-03**	**0.01**
POM/PAH	---	---
Toluene	**0.02**	**0.08**
TMP, 2,2,4-	**0.01**	**0.06**
Xylenes	**0.05**	**0.22**
Other/Trace HAP	---	---
Total HAP	**0.27**	**1.16**
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.).

AP-42

Please reference Supplement S3 - Emission Calculations

Emission Unit Description **TLO (23E)**

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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

_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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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 (1F) and FUG (2F)
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
FUG-G (1F) and FUG (2F)	**Process Piping and Equipment Leaks – Gas/Light Liquid (FUG-G and 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	**2017**	**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	**FUG-G (1F) and FUG (2F)**	
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)	**2.20**	**9.63**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**---**	**---**
Acrolein	**---**	**---**
Benzene	**3E-03**	**0.01**
Butadiene, 1,3-	**---**	**---**
Ethylbenzene	**0.03**	**0.14**
Formaldehyde	**---**	**---**
Hexane, n-	**0.14**	**0.62**
Methanol	**3E-03**	**0.01**
POM/PAH	**---**	**---**
Toluene	**0.02**	**0.07**
TMP, 2,2,4-	**0.01**	**0.05**
Xylenes	**0.04**	**0.18**
Other/Trace HAP	**---**	**---**
Total HAP	**0.25**	**1.09**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**4E-04**	**2E-03**
Methane (CH4) (GWP=25)	**0.07**	**0.29**
Nitrous Oxide (N2O) (GWP=298)	**---**	**---**
CO2 Equivalent (CO2e)	**1.63**	**7.16**

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 (1F) and FUG (2F)**

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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

_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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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 (3F)
Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ECC (3F)	Engine Crankcase (Sum of Four (4) Units)	na

Provide a description of the emissions unit (type. Method of operation, design parameters, etc.):

Internal combustion results in a small but continuous amount of blow-by, which occurs when some of the gases from combustion leak past the piston rings (that is, blow-by them) 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	2017	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		ECC (3F)
Criteria Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Monoxide (CO)	**0.35**	**1.51**
Nitrogen Oxides (NOX)	**0.05**	**0.23**
Lead (Pb)	**---**	**---**
Particulate Matter (PM2.5)	**4E-03**	**0.02**
Particulate Matter (PM10)	**4E-03**	**0.02**
Total Particulate Matter (TSP)	**4E-03**	**0.02**
Sulfur Dioxide (SO2)	**3E-04**	**1E-03**
Volatile Organic Compounds (VOC)	**0.15**	**0.64**
Hazardous Air Pollutants	**Pollutant Emissions**	
	PPH	**TPY**
Acetaldehyde	**4E-03**	**0.02**
Acrolein	**2E-03**	**0.01**
Benzene	**2E-04**	**8E-04**
Butadiene, 1,3-	**1E-04**	**5E-04**
Ethylbenzene	**2E-05**	**8E-05**
Formaldehyde	**0.03**	**0.12**
Hexane, n-	**5E-04**	**2E-03**
Methanol	**1E-03**	**5E-03**
POM/PAH	**2E-04**	**7E-04**
Toluene	**2E-04**	**8E-04**
TMP, 2,2,4-	**1E-04**	**5E-04**
Xylenes	**8E-05**	**4E-04**
Other/Trace HAP	**1E-04**	**6E-04**
Total HAP	**0.03**	**0.15**
Regulated Pollutants other than Criteria and HAP	**Pollutant Emissions**	
	PPH	**TPY**
Carbon Dioxide (CO2)	**59.25**	**259.50**
Methane (CH4) (GWP=25)	**0.21**	**0.91**
Nitrous Oxide (N2O) (GWP=298)	**1E-04**	**4E-04**
CO2 Equivalent (CO2e)	**64.46**	**282.35**

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 (3F)

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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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 NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
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)

"26. 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**

NOT APPLICABLE

Attachment F

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 na	
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(s)

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

- **Oxidation Catalyst (OxCat01 – OxCat04)**
- **10.00 MMBtu/hr Zeeco Z-HTO DFT/DSV Thermal Oxidizer**
- **8.00 MMBtu/hr Zeeco MJ-16 CBD/STAB/PIG Elevated Flare**
- **Vapor Recovery Unit (VRU-01)**

Appalachia Midstream Services, LLC

Pioneer Compressor Station

Application for Initial 45CSR30 Title V Operating Permit

Attachment G

Air Pollution Control Device Form

Control Device ID Number	**List all emission units associated with this control device.**	
OxCat-01 thru OxCat-04 (Each)	Compressor Engines 01 thru 04 (CE-01 thru CE-04)	
Manufacturer:	**Model Number:**	**Installation Date**
Catalytic Combustion	REMB-4815F-D	2018

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multicyclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drums	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	_X_ **Other (describe): 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

Pollutant	Capture Efficiency	Control Efficiency
CO	100%	92.0%
VOC (w/o HCHO)	100%	64.0%
VOC (w/ HCHO)	100%	67.2%
HCHO	100%	82.0%

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

Engine Exhaust Flow Rate: 32,023 acfm

Engine Exhaust temperature: 799 oF

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:

Although the potential pre-control emissions of carbon monoxide is >100% of the amount required to be classified as a major source, as this is the initial Title V application CAM is deferred until the Title V renewal.

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

Please Reference WVDEP-DAQ NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022

Also Supplement S2 - Regulatory Discussion

There are no requested changes

Appalachia Midstream Services, LLC

Pioneer Compressor Station

Application for Initial 45CSR30 Title V Operating Permit

Attachment G

Emission Unit Form

Emission Unit Description		**TO-01 (11E)**
Control device ID number:	**List all emission units associated with this control device.**	
TO-01 (11E)	**Dehydrators (DFT-01/-02 (7E/8E) and DSV-1/02 (9E/10E))**	
Manufacturer:	**Model Number:**	**Installation Date:**
Zeeco USA LLC	**Z-HTO**	**06/13/18**

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
_X_ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Prec	___ Dry Plate Electrostatic Precip	

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%**	**99.5%**
V-HAP	**100%**	**99.5%**
Methane	**100%**	**99.5%**

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

Design Flow Rate: **12,892 scf/hr** **755 Btu/scf (HHV)** **10.00 MMBtu/hr**

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

If Yes, Complete Attachment H na

If No, Provide justification:

The uncontrolled PTE for each underlying PSEU (DFT-01/-02 (7E/8E) and DSV-01/-02 (9E/10E)) is greater than than the TVOP threshold; however, preparation and submission of a CAM Plan is deferred until the TVOP Permit Renewal application.
See Supplement S2 - Regulatory Discussion.

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

Please Reference WVDEP-DAQ NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022
Also Supplement S2 - Regulatory Discussion
There are no requested changes

Appalachia Midstream Services, LLC

Pioneer Compressor Station

Application for Initial 45CSR30 Title V Operating Permit

Attachment G

Emission Unit Form

Emission Unit Description		**FLR-01 (14E)**
Control device ID number:	**List all emission units associated with this control device.**	
FLR-01 (14E)	**Blowdown (CBD (6E)), Pigging (PIG (24E)) and Stabilizer (STAB (25E))**	
Manufacturer:	**Model Number:**	**Installation Date:**
Zeeco USA LLC	**MJ-16 Elevated Flare**	**06/13/18**

Type of Air Pollution Control Device:

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

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

Pollutants	Capture Efficiency	Control Efficiency
Volatile Organic Compounds	**100%**	**98.0%**
V-HAP	**100%**	**98.0%**
Methane	**100%**	**98.0%**

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

Design Flow Rate: **12,892 scf/hr** **755 Btu/scf (HHV)** **10.00 MMBtu/hr**

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

If Yes, Complete Attachment H na

If No, Provide justification:

The pre-controlled PTE for each underlying PSEU (BD (7E) and PIG (21E)) is less than the TVOP threshold; therefore, the CAM requirements are not applicable. See Supplement S2 - Regulatory Discussion.

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

Please Reference WVDEP-DAQ NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022

Also Supplement S2 - Regulatory Discussion

There are no requested changes

Appalachia Midstream Services, LLC

Pioneer Compressor Station

Application for Initial 45CSR30 Title V Operating Permit

Attachment G

Air Pollution Control Device Form

Control Device ID Number	List all emission units associated with this control device.	
VRU-01	Stabilized Condensate and Produced Water Storage Tanks (TK-01 thru TK-10) Stabilized Condensate and Produced Water Truck Loading (TLO)	
Manufacturer:	**Model Number:**	**Installation Date**
---	---	2018

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multicyclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drums	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	_X_ **Other: Vapor Recovery Unit (VRU)**
___ 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

Pollutant	Capture Efficiency	Control Efficiency
VOC	100%	98.0%
HAP	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:

The potential pre-control emissions of the applicable regulated air pollutant is < 100% of the amount required to be classified as a major source (§64.2).

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

Please Reference WVDEP-DAQ NSR Class II Adminstrative Update No. R13-3491B, Issued 06/01/2022

Also Supplement S2 - Regulatory Discussion

There are no requested changes

Attachment H

Compliance Assurance Monitoring (CAM) Forms

(Not Applicable)

"27. 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."

- **Compliance Assurance Monitoring (CAM) Plan Form – Not Applicable**

In accordance with 40 CFR 64.5(b), for those pollutant-specific emissions units with the potential to emit (taking into account control devices to the extent appropriate under the definition of this term in §64.1) the applicable regulated air pollutant in an amount less than 100 percent of the amount, in tons per year, required for a source to be classified as a major source, the owner or operator shall submit the information required under §64.4 as part of an application for a renewal of a part 70 or 71 permit.

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

CAM Plan will be Submitted with First Title V Permit 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**

A. Project Overview

B. Compressor Engines (CE-01 (1E) thru CE-04 (4E))

C. Compressor Rod Packing Emissions (CRP (5E))

D. Compressor Blowdown Operations (CBD (6E)

E. Condensate Stabilizer (STAB (25E))

F. Tri-Ethylene Glycol (TEG) Dehydrators (DFT-01/-02 (7E/8E) and DSV-01/-01 (9E/10E))

G. Dehydrator Reboiler (RBV-01/-01 (12E/13E))

H. Storage Tanks (T-01 (15E) thru T-08 (22E), Misc. Tanks)

I. Truck Load-Out (TLO (23E))

J. Pigging Operations (PIG (24E))

K. DFT/DSV Thermal Oxidizer (TO-01 (11E))

L. CBD/STAB/PIG Elevated Flare (FLR-01 (14E))

M. Process Piping and Equipment Leaks (FUG-G (1F) and FUG-L (2F))

N. Engine Crankcase (ECC (3F))

Supplement S1

Process Description

A. Project Overview

Appalachia Midstream Services, LLC is submitting an application for Initial 45CSR30 Title V Operating Permit for the Pioneer Compressor Station located approximately 1.8 miles south of West Liberty at 300 Elysian Lane (a.k.a. Harvey's Road), Wheeling in Ohio County, West Virginia.

The facility receives natural gas from local production wells then compresses and dehydrates the gas for delivery to a gathering pipeline. Additionally, raw field condensate is received at the site, stabilized, and then sent offsite via tanker trucks.

B. Compressor Engines (CE-01 thru CE-04)

Four (4) natural gas-fueled reciprocating engines are utilized at the facility. These engines each drive a natural gas compressor to increase the pressure of the natural gas. Emissions result from the combustion of natural gas fuel. Each engine is equipped with an Oxidation Catalyst to control CO, VOC, and HAP emissions.

C. Compressor Rod Packing Leaks (CRP)

The reciprocating compressor operations result in emissions from the wear of mechanical seals around the piston rods over time. The rod packing leaks associated with the Caterpillar engine driven compressors are vented directly to the atmosphere as it is technically infeasible to control these emissions. Rod packing leaks from the electric motor driven stabilizer overheads VRU compressor are also vented directly to atmosphere as it is technically infeasible to control these emissions.

D. Compressor Blowdown (CBD)

As part of 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 must be evacuated (compressor blowdown (CBD)). Additionally, there will be other infrequent emissions from various maintenance activities at the facility that are not associated with compressor blowdowns such as emergency shutdown (ESD). Gas vapor from these blowdown operations will be routed to the Flare (FLR-01) for 98% CH4, VOC and HAP destruction.

E. Condensate Stabilizer (STAB)

An electrically heated 3-phase separator separates gas vapor, water, and condensate. Water goes to the produced water tanks. Raw condensate from the 3-phase separator is sent to a stabilizer tower skid to stabilize the condensate to an RVP 12 product. An electric immersion heater is used to provide the heat necessary to stabilize the condensate. Gas vapor and stabilizer overheads is gathered by an electric motor driven vapor recovery unit (VRU). The VRU discharges into the compressor facility suction line. The stabilizer VRU vents to the Flare (FLR-01) in the event of a shutdown and during short periods of maintenance (not to exceed 120 hours per year).

F. Tri-Ethylene Glycol (TEG) Dehydrator (DHY-01 and DHY-02)

Two (2) Triethylene Glycol (TEG) Dehydrators are utilized at the facility. Each dehydrator is comprised of a Contactor/Absorber Tower (no vented emissions), a Flash Tank (DFT-01 and DFT-02)), and a Regenerator/Still Vent (DSV-01 and DSV-02).

The TEG Dehydrator is used to remove water vapor from the inlet wet gas stream to meet pipeline specifications. In the dehydration process, 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 laden with water and trace amounts of hydrocarbons.

The rich glycol is then routed to a flash tank where the glycol pressure is reduced to liberate the lighter end hydrocarbons (especially methane). The lighter end hydrocarbons are routed from the flash tank to the reboiler for use as fuel with the excess hydrocarbons vented to the Thermal Oxidizer (TO-01) for 99.5% CH4, VOC and HAP destruction.

The rich glycol is then sent from the flash tank to the regenerator/still where the TEG is heated to drive off the water vapor and any remaining hydrocarbons. The off-gases from the regenerator/still are vented to the Thermal Oxidizer (TO-01) for 99.5% CH4, VOC and HAP destruction.

After regeneration, the glycol is returned to a lean state and used again in the process.

G. Reboilers (RBV-01 and RBV-02)

Two (2) gas-fueled reboilers are utilized to supply heat to the Regenerator/Still.

H. Storage Tanks (TK-01 thru TK-08, Misc. Tanks)

Six (6) 400 bbl storage tanks are used to hold the stabilized condensate from the condensate stabilizer and two (2) 400 bbl storage tanks will be used to hold the produced water from the inlet separator and the dehydrator. Gas vapors from these tanks are routed to the Vapor Recovery Unit (VRU) for 98% CH4, VOC and HAP recycle.

There are also tanks at the facility used to store various materials, including fresh and used lube oil, fresh and spent TEG, etc. Each of these misc. storage tanks generate de-minimis (insignificant) emissions.

I. Truck Load-Out (TLO)

Loading of stabilized condensate and produced water into tanker trucks occurs at the facility. Gas vapor from truck load-out (TLO) operations are routed to the Vapor Recovery Unit (VRU) for 98% CH4, VOC and HAP recycle.

J. 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 pigging operations result from releases of the gas vapor in the pig launcher and receiver for insertion and removal of the pig, respectively. Gas vapors from the pigging operations are routed to Flare (FLR-01) for 98% CH4, VOC and HAP destruction.

K. Thermal Oxidizer (TO-01)

One (1) Thermal Oxidizer (TO-01) with 99.5% CH4/VOC/HAPs destruction efficiency is used to control the Dehydrator's Flash Tank (DFT) and Still Vent (DSV) streams.

L. Elevated Flare (FLR-01)

One (1) Flare (FLR-01) with 98% CH4/VOC/HAPs destruction efficiency is used to control emissions from Compressor Blowdown (CBD), Pigging Operations (PIG) and the Condensate Stabilizer (STAB).

M. Piping and Equipment Fugitive Emissions (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.

N 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 piston rings (that is, blow-by them) to end up inside the crankcase, causing pressure to build up in the crank case. These Engine Crankcase (ECC) emissions are vented to the atmosphere.

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."

"**Section E**. List all applicable requirements for [each] emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. 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."

- **Regulatory Discussion**
  A. Applicability of New Source Review (NSR) Regulations
  B. Potential to Emit (PTE)
  C. Applicability of New Source Review (NSR) Regulations
  D. Applicability of Federal Regulations
  E. Applicability of Source Aggregation (Single-Source Determination)
  F. Applicability of State Regulations

Appalachia Midstream Services, LLC

Pioneer Compressor Station

Application for Initial 45CSR30 Title V Operating Permit

Supplement S2

Regulatory Discussion

A. Introduction

Appalachia Midstream Services, LLC operates Pioneer Compressor Station located approximately 1.6 miles south of West Liberty at 300 Elysian Lane (a.k.a. Harvey's Road), Wheeling in Ohio County, West Virginia.

The facility receives natural gas from local production wells then compresses and dehydrates the gas for delivery to a gathering pipeline. Additionally, raw field condensate is received at the site, stabilized, and then sent offsite via tanker trucks.

This application provides for the following equipment and operations at the subject facility:

- Four (4) 5,350 bhp CAT G3616LE Compressor Engines — CE-01 (1E) thru CE-04 (4E)
- Compressor Rod Packing — CRP (5E)
- Compressor Blowdown (and Emergency Shutdown Testing) — CBD (6E)
- Condensate Stabilizer (Electric Heater) — STAB (25E)
- Two (2) 125.0 MMscfd Dehydrators – Flash Tanks — DFT-01 (7E) and DFT-02 (9E)
- Two (2) 125.0 MMscfd Dehydrators – Still Vents — DSV-01 (8E) and DSV-02 (10E)
- Two (2) 2.00 MMBtu/hr Reboilers — RBV-01 (12E) and RBV-02 (13E)
- Six (6) Stabilized Condensate Storage Tanks (400 bbl Ea) — TK-01 (15E) thru TK-06 (20E)
- Two (2) Produced Water Storage Tanks (400 bbl Ea) — TK-07 (21E) and TK-08 (22E)
- Stabilized Condensate/Produced Water Truck Load-Out — TLO (23E)
- Pigging Operations (3 Receivers and 1 Launcher) — PIG (24E)
- One (1) 10.00 MMBtu/hr Thermal Oxidizer (Control for DFTs and DSVs) — TO-01 (11E)
- One (1) 8.00 MMBtu/hr Elevated Flare (Control for CBD and PIG) — FLR-01 (14E)
- One (1) Vapor Recovery Unit (Control for TKs, TLO, and STAB) — VRU
- Piping and Equipment Fugitives (Gas and Light Liquid) — FUG-G (1F) and FUG-L (2F)
- Engine Crankcase Emissions — ECC (3F)

B. Potential to Emit (PTE)

The facility is subject to the Title V Operating Permit (TVOP) program because the potential-to-emit (PTE) for an individual criteria pollutant (VOC) exceeds the 100 tons per year threshold. The facility is a minor (or area) source under the PSD permit regulations because the PTE for each individual criteria pollutant does not exceed the 250 tons per year threshold.

The facility-wide PTE is summarized on the following page.

Facility-Wide Potential to Emit (PTE) [Tons per Year]

Pollutant		Point Sources	Fugitive Sources	Total PTE
Criteria	NOX	92.10	0.23	92.33
	CO	69.36	1.51	70.87
	VOC	120.50	10.27	130.77
	SO2	0.46	1E-03	0.46
	PM10/2.5	7.57	0.02	7.59
HAP	Acetaldehyde	2.06	0.02	2.08
	Acrolein	1.27	0.01	1.28
	Benzene	0.30	0.01	0.31
	Butadiene, 1,3-	0.07	5E-04	0.07
	Ethylbenzene	0.27	0.14	0.41
	Formaldehyde (HCHO)	7.45	0.12	7.56
	Hexane, n-	2.28	0.62	2.90
	Methanol (MeOH)	0.84	0.02	0.85
	Polycyclic Organic Matter (POM/PAH)	0.09	7E-04	0.09
	Toluene	0.55	0.07	0.62
	Trimethylpentane, 2,2,4- (i-Octane)	0.21	0.05	0.26
	Xylenes	1.13	0.18	1.32
	Other/Trace HAP	0.08	6E-04	0.08
	Total Hazardous Air Pollutants (HAPs)	16.59	1.24	17.83
GHG	Carbon Dioxide (CO2) (GWP=1)	104,555	259.50	104,815
	Methane (CH4) (GWP=25)	392.92	1.20	394.12
	Nitrous Oxide (N2O) (GWP=298)	0.21	4E-04	0.21
	Carbon Dioxide Equivalent (CO2e)	114,440	289.51	114,730

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: BD, TLO, PIG, and FLR-01, each with intermittent operation.
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), comprised of: carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O), as adjusted for Global Warming Potential (GWP).

C. Applicability of New Source Review (NSR) Regulations

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

1. 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 Natural Minor Source with Pre-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

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

This rule does not apply. The facility is in Ohio County, WV, which is currently classified as Attainment, Unclassified, or Maintenance for all national ambient air quality standards (NAAQS) (http://www3.epa.gov/airquality/greenbook/ancl.html).

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

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

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

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

This rule does apply. With the requested Federally Enforceable Limits (FEL), the facility qualifies as a "Title V Major Source" as follows:

- NOx: Title V Natural Minor Source with Pre-Controlled PTE less than 100 tpy
- CO: Title V Synthetic Minor Source with Controlled PTE less 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.

D. Applicability of Federal Regulations

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-01 thru CE-04) because they are subject to NSPS JJJJ – Stationary Spark Ignition (SI) Internal Combustion Engines (ICE) (40CFR§60.4230-§60.4248).

This rule does apply to the facility because it is subject to NSPS OOOOa – Crude Oil and Natural Gas Production, Transmission and Distribution (40CFR§60.5360a-§60.5430a).

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 Thermal Oxidizer (TO-01) nor to the Flare (FLR-01) because they are 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 four (4) 5,000 bhp CAT G3616LE A4 lean burn Compressor Engines (CE-01 thru CE-04) because the maximum power of each engine is greater than 1,340 bhp and each engine was manufactured or reconstructed on or after 07/01/07 (§60.4230(a)(4)(i)).

Requirements include NOx, CO, and VOC emission limits (§60.4233(e-f)); operating limits (§60.4243); performance testing (§60.4244); and notification and recordkeeping (§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 [Not Applicable]

This rule does not apply because the facility was constructed 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 CAT G3616LE A4 Engines (CE-01 thru CE-04) and one electrically driven reciprocating VRU compressor 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)).

Requirements include replacing rod packing systems on a specified schedule (§60.5385(a)) and notification, monitoring, and recordkeeping and reporting (§60.5410(c), §60.5415(c), §60.5420(b)(1) and §60.5420(b)(4)).

This rule does apply to the Fugitive Emission Sources (FUG-G and FUG-L) at the facility (§60.5397a(b)).

Requirements include reducing GHG (in the form of a limitation on emissions of methane) and VOC emissions by developing a fugitive emission monitoring plan, monitoring all fugitive emission components, repairing all sources of fugitive emissions, and recordkeeping and reporting. For the purposes of this section, fugitive emissions are defined as: Any visible emission from a fugitive emissions component observed using optical gas imaging or an instrument reading of 500 ppm or greater using Method 21.

This rule does not apply to the Stabilized Condensate Storage Tanks (TK-01 thru TK-06) nor to the Produced Water Storage Tanks (TK-07 and TK-08) (nor any other tank) at the facility 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. NESHAP Part 61 - Designated Source Standards

40CFR§61.01-§61.359 [Not Applicable]

This rule does not apply because the facility is not a NESHAP Designated Facility (or Source).

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

14. NESHAP Part 63 (aka: MACT) - General Provisions

40CFR§63.1-§63.16 [Applicable/Exempt]

This rule does apply to the Dehydrators (DFT-01/-02 and DSV-01-02). However, because the facility is an area source of HAP emissions, and the actual average emissions of benzene from the glycol dehydrator is less than 0.90 megagram per year (1.0 tpy), the only requirement is to maintain records of the actual average benzene emissions to demonstrate continuing exemption status (§63.764(e)(1)(ii)).

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.

15. NESHAP HH, Oil and Natural Gas Production Facilities

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

This rule does apply to the Dehydrators (DFT-01/-02 and DSV-01-02). However, because the facility is an area source of HAP emissions, and the actual average emissions of benzene from the glycol dehydrator is less than 0.90 megagram per year (1.0 tpy), the only requirement is to maintain records of the actual average benzene emissions to demonstrate continuing exemption status (§63.764(e)(1)(ii)).

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.

16. 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)).

17. 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).

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

40CFR§63.6580-§63.6675 [Applicable/Exempt]

This rule does apply to the 5,350 bhp CAT G3616LE A4 Compressor Engines (CE-01 thru CE-04). 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.

19. 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).

20. 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 (RBV-01/-02) 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".

21. Compliance Assurance Monitoring (CAM)

40CFR§64.1-§64.10 [Applicable/Deferred]

This rule does apply to the Dehydrators (DFT-01/-02 and DSV-01/-02) controlled by Thermal Oxidizer (TO-01), and the Compressor Blowdown (CBD) controlled by the Elevated Flare (FLR-01). 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 any other PSEU at the facility because none have potential pre-controlled potential emissions equal or greater than the Title V Major Source Threshold (§64.2(a)(3)).

22. Chemical Accident Prevention Provisions (Risk Management Plan (RMP))

40CFR§68.1-§68.220 [Not Applicable]

This rule does not apply because the facility does not store more than a threshold quantity of a regulated substance in a process.

Specifically, "Prior 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)).

23. Mandatory Greenhouse Gases (GHG) Reporting

40CFR§98.1-§98.9 [Applicable]

This rule does apply because the CO2e emissions from all stationary sources combined within the hydrocarbon basin as defined in 40 CFR Part 98 is ≥ 25,000 metric ton/yr (§98.2(a)(3)).

In any case, the aggregate max heat input capacity of stationary fuel combustion units at the facility is equal to or greater than 30 MMBtu/hr.

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

E. Applicability of Source Aggregation (Single-Source Determination)

The operations of the facility have not been aggregated with any other gas production, midstream service facilities, or transportation operations because there are no other oil and gas facilities or operations that are both a) "contiguous and adjacent" and b) "under common control" to the facility.

F. 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 (RBV-01 and RBV-02); however, because the reboilers 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 reboiler combusts 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 Thermal Oxidizer (TO-01) and to the Flare (FLR-01); however, these units combust 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-01 thru CE-04), Reboilers (RBV-01/-02), Thermal Oxidizer (TO-01), Flare (FLR-01), 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 R13-3491B, issued 06/01/22.

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

- **Emission Summary Spreadsheets**
  - Potential to Emit (PTE) – Criteria Pollutants – Controlled
  - Potential to Emit (PTE) – Hazardous Air Pollutants (HAP) – Controlled
  - Potential to Emit (PTE) – Greenhouse Gases (GHG) – Controlled
  - Potential to Emit (PTE) – Criteria Pollutants – PRE-Controlled
  - Potential to Emit (PTE) – Hazardous Air Pollutants (HAP) – PRE-Controlled
  - Potential to Emit (PTE) – Greenhouse Gases (GHG) – PRE-Controlled
- **Unit-Specific Emission Spreadsheets**
  - Compressor Engine (CE-01 (1E) thru CE-04 (4E))
  - Compressor Rod Packing (CRP (5E))
  - Compressor Blowdown (and Shutdown Tests) (CBD (5E))
  - Condensate Stabilizer (Electric Heater) (STAB (25E))
  - Dehydrator (DFT-01/-02 (7E/8E) and DSV-01/-02 (9E/10E))
  - Reboiler (RBV-01/-02 (12E/13E))
  - Stabilized Condensate - Storage Tank (T-01 thru T-06 (15E thru 20E)) and Produced Water - Storage Tank (T-07 and T-08 (21E and 22E))
  - Stabilized Condensate and Produced Water - Truck Load-Out (TLO (23E))
- **Air Pollution Control Equipment**
  - DFT/DSV Thermal Oxidizer (TO-01 (11E))
  - CBD/STAB/PIG Elevated Flare (FLR-01 (14E))
- **Fugitive Emissions**
  - Process Piping and Equipment Leak (FUG-G (1F)) – Gas
  - Process Piping and Equipment Leak (FUG-O (2F)) – Light Liquid
  - Engine Crankcase (ECC (3F))

Potential-to-Emit (PTE) - Criteria Pollutants - Controlled

Unit ID	Point ID	Control ID	Description	Site Rating	NOX		CO		VOC (w/HCHO)		SO2		PM10/2.5	
					lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Pioneer Compressor Station - Point Source PTE														
CE-01	1E	OxCat-01	Compressor Engine 01 - CAT G3616LE A4	5,350 bhp	4.72	20.66	2.48	10.87	4.31	18.87	0.02	0.10	0.39	1.71
CE-02	2E	OxCat-02	Compressor Engine 02 - CAT G3616LE A4	5,350 bhp	4.72	20.66	2.48	10.87	4.31	18.87	0.02	0.10	0.39	1.71
CE-03	3E	OxCat-03	Compressor Engine 03 - CAT G3616LE A4	5,350 bhp	4.72	20.66	2.48	10.87	4.31	18.87	0.02	0.10	0.39	1.71
CE-04	4E	OxCat-04	Compressor Engine 04 - CAT G3616LE A4	5,350 bhp	4.72	20.66	2.48	10.87	4.31	18.87	0.02	0.10	0.39	1.71
CRP	5E	---	Compressor Rod Packing	5 Compr's	---	---	---	---	5.72	25.07	---	---	---	---
CBD	6E	FLR-01	Compressor Blowdown (and Shutdown Tests)	5 Compr's	---	---	---	---	0.86	3.79				
STAB	25E	FLR-01***	Condensate Stabilizer (Electric Heater)	---	---	---	---	---	10.45	0.63	---	---	---	---
DFT-01	7E	TO-01	Dehydrator 01 - Flash Tank	125.0 MMscfd	---	---	---	---	0.23	1.01	---	---	---	---
DSV-01	8E		Dehydrator 01 - Still Vent		---	---	---	---	0.40	1.77	---	---	---	---
RBV-01	12E	---	Dehydrator 01 - Reboiler	2.00 MMBtu/hr	0.20	0.86	0.16	0.72	0.01	0.05	1E-03	0.01	0.01	0.07
DFT-02	9E	TO-01	Dehydrator 02 - Flash Tank	125.0 MMscfd	---	---	---	---	0.23	1.01	---	---	---	---
DSV-02	10E		Dehydrator 02 - Still Vent		---	---	---	---	0.40	1.77	---	---	---	---
RBV-02	13E	---	Dehydrator 02 - Reboiler	2.00 MMBtu/hr	0.20	0.86	0.16	0.72	0.01	0.05	1E-03	0.01	0.01	0.07
T-01	15E	VRU-01	Storage Tank 01 - Stabilized Condensate	400 bbl	---	---	---	---	0.02	0.08	---	---	---	---
T-02	16E		Storage Tank 02 - Stabilized Condensate	400 bbl	---	---	---	---	0.02	0.08	---	---	---	---
T-03	17E		Storage Tank 03 - Stabilized Condensate	400 bbl	---	---	---	---	0.02	0.08	---	---	---	---
T-04	18E		Storage Tank 04 - Stabilized Condensate	400 bbl	---	---	---	---	0.02	0.08	---	---	---	---
T-05	19E		Storage Tank 05 - Stabilized Condensate	400 bbl	---	---	---	---	0.02	0.08	---	---	---	---
T-06	20E		Storage Tank 06 - Stabilized Condensate	400 bbl	---	---	---	---	0.02	0.08	---	---	---	---
T-07	21E		Storage Tank 07 - Produced Water	400 bbl	---	---	---	---	2E-04	7E-04	---	---	---	---
T-08	22E		Storage Tank 08 - Produced Water	400 bbl	---	---	---	---	2E-04	7E-04	---	---	---	---
TLO	23E	VRU-01	Truck Load-Out - Stabilized Condensate	168,000 bbl/yr	---	---	---	---	1.67	7.32	---	---	---	---
			Truck Load-Out - Produced Water	30,000 bbl/yr	---	---	---	---	0.01	0.07	---	---	---	---
PIG	24E	FLR-01	Pigging Operations (3 Receivers, 1 Launcher)	1,772 events/yr	---	---	---	---	0.36	1.57	---	---	---	---
TO-01	11E	---	DFT/DSV Thermal Oxidizer (Combustion Only)	10.00 MMBtu/hr	0.98	4.29	3.10	13.58	0.05	0.24	0.01	0.03	0.07	0.33
FLR-01	14E	---	CBD/PIG Elevated Flare (Comb. Only)	8.00 MMBtu/hr	0.78	3.44	2.48	10.86	0.04	0.19	5E-03	0.02	0.06	0.26
VRU	---	---	TK/TLO/STAB VRU (Electric Compressor)	---	Negligible Emissions from Totally Enclosed VRU									
			Total Point Source PTE:		**21.03**	**92.10**	**15.84**	**69.36**	**37.82**	**120.50**	**0.11**	**0.46**	**1.73**	**7.57**
			TVOP Threshold**:		---	100	---	100	---	**100**	---	100	---	100
Pioneer Compressor Station - Fugitive Source PTE														
FUG-G	1F	LDAR	Process Piping & Equipment Leaks - Gas	4,981 Fittings	---	---	---	---	0.84	3.67	---	---	---	---
FUG-L	2F		Process Piping & Equipment Leaks - Light Oil	2,271 Fittings	---	---	---	---	1.36	5.96	---	---	---	---
ECC	3F	---	Engine Crankcase (CE-01 thru -04)	4 Engines	0.05	0.23	0.35	1.51	0.15	0.64	3E-04	1E-03	4E-03	0.02
			Total Fugitive Source PTE:		**0.05**	**0.23**	**0.35**	**1.51**	**2.34**	**10.27**	**3E-04**	**1E-03**	**4E-03**	**0.02**
Pioneer Compressor Station - Total PTE														
			Total Facility-Wide PTE:		**21.08**	**92.33**	**16.18**	**70.87**	**40.16**	**130.77**	**0.11**	**0.46**	**1.73**	**7.59**
			TVOP Threshold**:		---	na	---	na	---	na	---	na	---	na

* lb/hr is based on 8,760 hr/yr, including Blowdown (BD), Truck Load-Out (TLO), Pigging Operations (PIG), and Flare-01 (FLR-01) each which operate less frequent.

** Fugitive emissions of criteria pollutants are not included in major source determination because the facility is not an EPA listed source category.

*** 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).

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
NOX		CO		VOC (w/HCHO)		SO2		PM10/2.5	

Potential-to-Emit (PTE) - Hazardous Air Pollutants (HAP) - Controlled - 01 of 02

Unit ID	Point ID	Control ID	Description	Site Rating	Acetaldehyde		Acrolein		Benzene		Butadiene, 1,3-		Ethylbenzene		HCHO		Hexane, n-	
					lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Pioneer Compressor Station - Point Source PTE																		
CE-01	1E	OxCat-01	Compressor Engine 01 - CAT G3616LE A4	5,350 bhp	0.12	0.52	0.07	0.32	0.01	0.03	4E-03	0.02	6E-04	2E-03	0.42	1.86	0.02	0.07
CE-02	2E	OxCat-02	Compressor Engine 02 - CAT G3616LE A4	5,350 bhp	0.12	0.52	0.07	0.32	0.01	0.03	4E-03	0.02	6E-04	2E-03	0.42	1.86	0.02	0.07
CE-03	3E	OxCat-03	Compressor Engine 03 - CAT G3616LE A4	5,350 bhp	0.12	0.52	0.07	0.32	0.01	0.03	4E-03	0.02	6E-04	2E-03	0.42	1.86	0.02	0.07
CE-04	4E	OxCat-04	Compressor Engine 04 - CAT G3616LE A4	5,350 bhp	0.12	0.52	0.07	0.32	0.01	0.03	4E-03	0.02	6E-04	2E-03	0.42	1.86	0.02	0.07
CRP	5E	---	Compressor Rod Packing	5 Compr's	---	---	---	---	0.01	0.04	---	---	0.01	0.04	---	---	0.18	0.79
CBD	25E	FLR-01	Compressor Blowdown (and Shutdown Tests)	5 Compr's	---	---	---	---	1E-03	6E-03	---	---	1E-03	6E-03	---	---	0.03	0.12
STAB	25E	FLR-01***	Condensate Stabilizer (Electric Heater)	---	---	---	---	---	1E-03	9E-05	---	---	4E-03	2E-04	---	---	0.15	0.01
DFT-01	7E	TO-01	Dehydrator 01 - Flash Tank	125.0 MMscfd	---	---	---	---	2E-04	8E-04	---	---	1E-05	6E-05	---	---	0.01	0.03
DSV-01	8E		Dehydrator 01 - Still Vent		---	---	---	---	0.02	0.07	---	---	4E-03	0.02	---	---	0.02	0.08
RBV-01	12E	---	Dehydrator 01 - Reboiler	2.00 MMBtu/hr	---	---	---	---	4E-06	2E-05	---	---	---	---	1E-04	6E-04	4E-03	0.02
DFT-02	9E	TO-01	Dehydrator 02 - Flash Tank	125.0 MMscfd	---	---	---	---	2E-04	8E-04	---	---	1E-05	6E-05	---	---	0.01	0.03
DSV-02	10E		Dehydrator 02 - Still Vent		---	---	---	---	0.02	0.07	---	---	4E-03	0.02	---	---	0.02	0.08
RBV-02	13E	---	Dehydrator 02 - Reboiler	2.00 MMBtu/hr	---	---	---	---	4E-06	2E-05	---	---	---	---	1E-04	6E-04	4E-03	0.02
T-01	15E	VRU-01	Storage Tank 01 - Stabilized Condensate	400 bbl	---	---	---	---	2E-05	7E-05	---	---	4E-04	2E-03	---	---	2E-03	0.01
T-02	16E		Storage Tank 02 - Stabilized Condensate	400 bbl	---	---	---	---	2E-05	7E-05	---	---	4E-04	2E-03	---	---	2E-03	0.01
T-03	17E		Storage Tank 03 - Stabilized Condensate	400 bbl	---	---	---	---	2E-05	7E-05	---	---	4E-04	2E-03	---	---	2E-03	0.01
T-04	18E		Storage Tank 04 - Stabilized Condensate	400 bbl	---	---	---	---	2E-05	7E-05	---	---	4E-04	2E-03	---	---	2E-03	0.01
T-05	19E		Storage Tank 05 - Stabilized Condensate	400 bbl	---	---	---	---	2E-05	7E-05	---	---	4E-04	2E-03	---	---	2E-03	0.01
T-06	20E		Storage Tank 06 - Stabilized Condensate	400 bbl	---	---	---	---	2E-05	7E-05	---	---	4E-04	2E-03	---	---	2E-03	0.01
T-07	21E		Storage Tank 07 - Produced Water	400 bbl	---	---	---	---	1E-07	6E-07	---	---	4E-06	2E-05	---	---	1E-05	6E-05
T-08	22E		Storage Tank 08 - Produced Water	400 bbl	---	---	---	---	1E-07	6E-07	---	---	4E-06	2E-05	---	---	1E-05	6E-05
TLO	23E	VRU-01	Truck Load-Out - Stabilized Condensate	168,000 bbl/yr	---	---	---	---	1E-03	0.01	---	---	0.04	0.17	---	---	0.14	0.62
			Truck Load-Out - Produced Water	30,000 bbl/yr	---	---	---	---	1E-05	6E-05	---	---	3E-04	1E-03	---	---	1E-03	0.01
PIG	24E	FLR-01	Pigging Operations (3 Receivers, 1 Launcher)	1,772 events/yr	---	---	---	---	6E-04	2E-03	---	---	6E-04	2E-03	---	---	0.01	0.05
TO-01	11E	---	DFT/DSV Thermal Oxidizer (Combustion Only)	10.00 MMBtu/hr	---	---	---	---	2E-05	9E-05	---	---	---	---	7E-04	3E-03	0.02	0.08
FLR-01	14E	---	CBD/PIG Elevated Flare (Comb. Only)	8.00 MMBtu/hr	---	---	---	---	2E-05	7E-05	---	---	---	---	6E-04	3E-03	0.01	0.06
VRU	---	---	TK/TLO/STAB VRU (Electric Compressor)	---	Negligible Emissions from Totally Enclosed VRU													
				Total Point Source PTE:	**0.47**	**2.06**	**0.29**	**1.27**	**0.07**	**0.30**	**0.02**	**0.07**	**0.07**	**0.27**	**1.70**	**7.45**	**0.67**	**2.28**
				TVOP Threshold**:	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pioneer Compressor Station - Fugitive Source PTE																		
FUG-G	1F	LDAR	Process Piping Fugitives - Gas	4,981 Fittings	---	---	---	---	1E-03	0.01	---	---	1E-03	0.01	---	---	0.03	0.12
FUG-L	2F		Process Piping Fugitives - Light Oil	2,271 Fittings	---	---	---	---	1E-03	0.01	---	---	0.03	0.14	---	---	0.11	0.50
ECC	3F	---	Engine Crankcase (CE-01 thru -04)	4 Engines	4E-03	0.02	2E-03	0.01	2E-04	8E-04	1E-04	5E-04	2E-05	8E-05	0.03	0.12	5E-04	2E-03
				Total Fugitive Source PTE:	**4E-03**	**0.02**	**2E-03**	**0.01**	**3E-03**	**0.01**	**1E-04**	**5E-04**	**0.03**	**0.14**	**0.03**	**0.12**	**0.14**	**0.62**
Pioneer Compressor Station - Total PTE																		
				Total Facility-Wide PTE:	**0.47**	**2.08**	**0.29**	**1.28**	**0.07**	**0.31**	**0.02**	**0.07**	**0.10**	**0.41**	**1.73**	**7.56**	**0.81**	**2.90**
				TVOP Threshold**:	---	10	---	10	---	10	---	10	---	10	---	10	---	10
					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**		**Hexane, n-**	

* lb/hr is based on 8,760 hr/yr, including Blowdown (BD), Truck Load-Out (TLO), Pigging Operations (PIG), and Flare-01 (FLR-01) each which operate less frequent.

** Fugitive emissions of criteria pollutants are not included in major source determination because the facility is not an EPA listed source category.

*** 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).

Potential-to-Emit (PTE) - Hazardous Air Pollutants (HAP) - Controlled - 02 of 02

Unit ID	Point ID	Control ID	Description	Site Rating	Methanol		POM/PAH		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
Pioneer Compressor Station - Point Source PTE																		
CE-01	1E	OxCat-01	Compressor Engine 01 - CAT G3616LE A4	5,350 bhp	0.04	0.15	0.01	0.02	0.01	0.03	4E-03	0.02	3E-03	0.01	0.00	0.02	**0.70**	**3.06**
CE-02	2E	OxCat-02	Compressor Engine 02 - CAT G3616LE A4	5,350 bhp	0.04	0.15	0.01	0.02	0.01	0.03	4E-03	0.02	3E-03	0.01	0.00	0.02	**0.70**	**3.06**
CE-03	3E	OxCat-03	Compressor Engine 03 - CAT G3616LE A4	5,350 bhp	0.04	0.15	0.01	0.02	0.01	0.03	4E-03	0.02	3E-03	0.01	0.00	0.02	**0.70**	**3.06**
CE-04	4E	OxCat-04	Compressor Engine 04 - CAT G3616LE A4	5,350 bhp	0.04	0.15	0.01	0.02	0.01	0.03	4E-03	0.02	3E-03	0.01	0.00	0.02	**0.70**	**3.06**
CRP	5E	---	Compressor Rod Packing	5 Compr's	0.01	0.04	---	---	0.01	0.04	0.01	0.04	0.01	0.04	---	---	**0.23**	**1.02**
CBD	25E	FLR-01	Compressor Blowdown (and Shutdown Tests)	5 Compr's	1E-03	6E-03	---	---	1E-03	6E-03	1E-03	6E-03	1E-03	6E-03	---	---	**0.04**	**0.15**
STAB	25E	FLR-01***	Condensate Stabilizer (Electric Heater)	---	1E-05	7E-07	---	---	0.01	4E-04	0.00	3E-04	0.00	3E-04	---	---	**0.17**	**0.01**
DFT-01	7E	TO-01	Dehydrator 01 - Flash Tank	125.0 MMscfd	6E-05	2E-04	---	---	2E-04	1E-03	1E-05	6E-05	2E-04	1E-03	---	---	**0.01**	**0.03**
DSV-01	8E		Dehydrator 01 - Still Vent		0.02	0.08	---	---	0.03	0.15	4E-03	0.02	0.09	0.40	---	---	**0.19**	**0.81**
RBV-01	12E	---	Dehydrator 01 - Reboiler	2.00 MMBtu/hr	---	---	1E-06	6E-06	7E-06	3E-05	---	---	---	---	2E-06	1E-05	**4E-03**	**0.02**
DFT-02	9E	TO-01	Dehydrator 02 - Flash Tank	125.0 MMscfd	6E-05	2E-04	---	---	2E-04	1E-03	1E-05	6E-05	2E-04	1E-03	---	---	**0.01**	**0.03**
DSV-02	10E		Dehydrator 02 - Still Vent		0.02	0.08	---	---	0.03	0.15	4E-03	0.02	0.09	0.40	---	---	**0.19**	**0.81**
RBV-02	13E	---	Dehydrator 02 - Reboiler	2.00 MMBtu/hr	---	---	1E-06	6E-06	7E-06	3E-05	---	---	---	---	2E-06	1E-05	**4E-03**	**0.02**
T-01	15E	VRU-01	Storage Tank 01 - Stabilized Condensate	400 bbl	2E-05	7E-05	---	---	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	---	---	**3E-03**	**0.01**
T-02	16E		Storage Tank 02 - Stabilized Condensate	400 bbl	2E-05	7E-05	---	---	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	---	---	**3E-03**	**0.01**
T-03	17E		Storage Tank 03 - Stabilized Condensate	400 bbl	2E-05	7E-05	---	---	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	---	---	**3E-03**	**0.01**
T-04	18E		Storage Tank 04 - Stabilized Condensate	400 bbl	2E-05	7E-05	---	---	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	---	---	**3E-03**	**0.01**
T-05	19E		Storage Tank 05 - Stabilized Condensate	400 bbl	2E-05	7E-05	---	---	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	---	---	**3E-03**	**0.01**
T-06	20E		Storage Tank 06 - Stabilized Condensate	400 bbl	2E-05	7E-05	---	---	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	---	---	**3E-03**	**0.01**
T-07	21E		Storage Tank 07 - Produced Water	400 bbl	1E-07	6E-07	---	---	2E-06	8E-06	1E-06	5E-06	5E-06	2E-05	---	---	**3E-05**	**1E-04**
T-08	22E		Storage Tank 08 - Produced Water	400 bbl	1E-07	6E-07	---	---	2E-06	8E-06	1E-06	5E-06	5E-06	2E-05	---	---	**3E-05**	**1E-04**
TLO	23E	VRU-01	Truck Load-Out - Stabilized Condensate	168,000 bbl/yr	1E-03	6E-03	---	---	0.02	0.08	0.01	0.06	0.05	0.22	---	---	**0.26**	**1.15**
			Truck Load-Out - Produced Water	30,000 bbl/yr	1E-05	6E-05	---	---	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	---	---	**2E-03**	**1E-02**
PIG	24E	FLR-01	Pigging Operations (3 Receivers, 1 Launcher)	1,772 events/yr	6E-04	2E-03	---	---	6E-04	2E-03	6E-04	2E-03	6E-04	2E-03	---	---	**0.01**	**0.06**
TO-01	11E	---	DFT/DSV Thermal Oxidizer (Combustion Only)	10.00 MMBtu/hr	---	---	7E-06	3E-05	3E-05	1E-04	---	---	---	---	1E-05	5E-05	**0.02**	**0.08**
FLR-01	14E	---	CBD/PIG Elevated Flare (Comb. Only)	8.00 MMBtu/hr	---	---	5E-06	2E-05	3E-05	1E-04	---	---	---	---	9E-06	4E-05	**0.01**	**0.06**
VRU	---	---	TK/TLO/STAB VRU (Electric Compressor)	---	Negligible Emissions from Totally Enclosed VRU													
				Total Point Source PTE:	**0.19**	**0.84**	**0.02**	**0.09**	**0.13**	**0.55**	**0.05**	**0.21**	**0.26**	**1.13**	**0.02**	**0.08**	**3.95**	**16.59**
				TVOP Threshold**:	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pioneer Compressor Station - Fugitive Source PTE																		
FUG-G	1F	LDAR	Process Piping Fugitives - Gas	4,981 Fittings	1E-03	0.01	---	---	1E-03	0.01	1E-03	0.01	1E-03	0.01	---	---	**0.03**	**0.15**
FUG-L	2F		Process Piping Fugitives - Light Oil	2,271 Fittings	1E-03	0.01	---	---	0.02	0.07	0.01	0.05	0.04	0.18	---	---	**0.21**	**0.94**
ECC	3F	---	Engine Crankcase (CE-01 thru -04)	4 Engines	1E-03	5E-03	2E-04	7E-04	2E-04	8E-04	1E-04	5E-04	8E-05	4E-04	1E-04	6E-04	**0.03**	**0.15**
				Total Fugitive Source PTE:	**4E-03**	**0.02**	**2E-04**	**7E-04**	**0.02**	**0.07**	**0.01**	**0.05**	**0.04**	**0.18**	**1E-04**	**6E-04**	**0.28**	**1.24**
Pioneer Compressor Station - Total PTE																		
				Total Facility-Wide PTE:	**0.19**	**0.85**	**0.02**	**0.09**	**0.15**	**0.62**	**0.06**	**0.26**	**0.30**	**1.32**	**0.02**	**0.08**	**4.24**	**17.83**
				TVOP Threshold**:	---	10	---	10	---	10	---	10	---	10	---	10	---	25

* lb/hr is based on 8,760 hr/yr, including Blowdown (BD), Truck Load-Out (TLO), Pigging Operations (PIG), and Flare-01 (FLR-01) each which operate less frequent.

** Fugitive emissions of criteria pollutants are not included in major source determination because the facility is not an EPA listed source category.

*** 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).

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Methanol		POM/PAH		Toluene		TMP, 2,2,4-		Xylenes		Other HAP		TOTAL HAPs	

Potential-to-Emit (PTE) - Greenhouse Gas (GHG) Pollutants - Controlled

Unit ID	Point ID	Control ID	Description	Site Rating	Heat Input MMBtu/hr (HHV)	Hours of Operation hr/yr*	CO2 GWP: 1 tpy	CO2e 1.00 tpy	CH4 GWP: 25 tpy	CO2e 25.00 tpy	N2O GWP: 298 tpy	CO2e 298.00 tpy	TOTAL CO2e lb/hr*	TOTAL CO2e tpy
Pioneer Compressor Station - Point Source PTE														
CE-01	1E	OxCat-01	Compressor Engine 01 - CAT G3616LE A4	5,350 bhp	39.15	8,760	23,299	23,299	81.62	2,041	0.04	11.27	**5,788**	**25,351**
CE-02	2E	OxCat-02	Compressor Engine 02 - CAT G3616LE A4	5,350 bhp	39.15	8,760	23,299	23,299	81.62	2,041	0.04	11.27	**5,788**	**25,351**
CE-03	3E	OxCat-03	Compressor Engine 03 - CAT G3616LE A4	5,350 bhp	39.15	8,760	23,299	23,299	81.62	2,041	0.04	11.27	**5,788**	**25,351**
CE-04	4E	OxCat-04	Compressor Engine 04 - CAT G3616LE A4	5,350 bhp	39.15	8,760	23,299	23,299	81.62	2,041	0.04	11.27	**5,788**	**25,351**
CRP	5E	---	Compressor Rod Packing	5 Compr's	---	8,760	0.31	0.31	53.20	1,330	---	---	**303.71**	**1,330**
CBD	25E	FLR-01	Compressor Blowdown (and Shutdown Tests)	---	---	8,760	2.37	2.37	8.03	200.87	---	---	**46.40**	**203.24**
STAB	25E	FLR-01***	Condensate Stabilizer (Electric Heater)	---	11.39	8,760	0.04	0.04	0.06	1.55	---	---	**26.36**	**1.58**
DFT-01	7E	TO-01	Dehydrator 01 - Flash Tank	125.0 MMscfd	---	8,760	5.36	5.36	0.75	18.63	---	---	**5.48**	**24.00**
DSV-01	8E		Dehydrator 01 - Still Vent		---	8,760	4.10	4.10	0.04	1.06	---	---	**1.18**	**5.17**
RBV-01	12E	---	Dehydrator 01 - Reboiler	2.00 MMBtu/hr	2.00	8,760	1,031	1,031	0.02	0.49	0.02	5.63	**236.69**	**1,037**
DFT-02	9E	TO-01	Dehydrator 02 - Flash Tank	125.0 MMscfd	---	8,760	5.36	5.36	0.75	18.63	---	---	**5.48**	**24.00**
DSV-02	10E		Dehydrator 02 - Still Vent		---	8,760	4.10	4.10	0.04	1.06	---	---	**1.18**	**5.17**
RBV-02	13E	---	Dehydrator 02 - Reboiler	2.00 MMBtu/hr	2.00	8,760	1,031	1,031	0.02	0.49	0.02	5.63	**236.69**	**1,037**
T-01	15E	VRU-01	Storage Tank 01 - Stabilized Condensate	400 bbl	---	8,760	Negligible GHG Emissions from Stabilized Condensate (SC)							
T-02	16E		Storage Tank 02 - Stabilized Condensate	400 bbl	---	8,760								
T-03	17E		Storage Tank 03 - Stabilized Condensate	400 bbl	---	8,760								
T-04	18E		Storage Tank 04 - Stabilized Condensate	400 bbl	---	8,760								
T-05	19E		Storage Tank 05 - Stabilized Condensate	400 bbl	---	8,760								
T-06	20E		Storage Tank 06 - Stabilized Condensate	400 bbl	---	8,760								
T-07	21E	0.00	Storage Tank 07 - Produced Water	400 bbl	---	8,760	Negligible GHG Emissions from Produced Water (PW)							
T-08	22E		Storage Tank 08 - Produced Water	400 bbl	---	8,760								
TLO	23E	VRU-01	Truck Load-Out - Stabilized Condensate	168,000 bbl/yr	---	8,760	Negligible GHG Emissions from Stabilized Condensate (SC)							
			Truck Load-Out - Produced Water	30,000 bbl/yr	---	8,760	Negligible GHG Emissions from Produced Water (PW)							
PIG	24E	FLR-01	Pigging Operations (3 Receivers, 1 Launcher)	1,772 events/yr	---	8,760	0.99	0.99	3.34	83.53	---	---	**1,352.23**	**84.51**
TO-01	11E	---	DFT/DSV Thermal Oxidizer (Combustion Only)	10.00 MMBtu/hr	10.00	8,760	5,153	5,153	0.10	2.47	0.01	2.88	**1,177.69**	**5,158**
FLR-01	14E	---	CBD/PIG Elevated Flare (Comb. Only)	8.00 MMBtu/hr	8.00	8,760	4,122	4,122	0.08	1.98	0.01	2.30	**---**	**4,127**
VRU	---	---	TK/TLO/STAB VRU (Electric Compressor)	---	---	8,760	Negligible Emissions from Totally Enclosed VRU							
					Total Point Source PTE:		**104,555**	**104,555**	**392.92**	**9,823**	**0.21**	**61.50**	**26,545**	**114,440**
					TVOP Threshold**:		na	na	na	na	na	na	na	na
Pioneer Compressor Station - Fugitive Source PTE														
FUG-G	1F	LDAR	Process Piping & Equipment Leaks - Gas	4,981 Fittings	---	8,760	2E-03	2E-03	0.29	7.15	---	---	**1.63**	**7.16**
FUG-L	2F		Process Piping & Equipment Leaks - Light Oil	2,271 Fittings	---	8,760	---	---	---	---	---	---	**---**	**---**
ECC	3F	---	Engine Crankcase (CE-01 thru -04)	4 Engines	---	8,760	259.50	259.50	0.91	22.73	4E-04	0.13	**64.46**	**282.35**
					Total Fugitive Source PTE:		**259.50**	**259.50**	**1.20**	**29.88**	**4E-04**	**0.13**	**66.10**	**289.51**
Pioneer Compressor Station - Total PTE														
					Total Facility-Wide PTE:		**104,815**	**104,815**	**394.12**	**9,853**	**0.21**	**61.63**	**26,611**	**114,730**
					TVOP Threshold**:		na	na	na	na	na	na	na	na

* lb/hr is based on 8,760 hr/yr, including Blowdown (BD), Truck Load-Out (TLO), Pigging Operations (PIG), and Flare-01 (FLR-01) each which operate less frequent.

** Fugitive emissions of criteria pollutants are not included in major source determination because the facility is not an EPA listed source category.

*** 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).

tpy CO2	tpy CO2e	tpy CH4	tpy CO2e	tpy N2O	tpy CO2e	lb/hr* TOTAL CO2e	tpy TOTAL CO2e

Potential-to-Emit (PTE) – Regulated Pollutants - PRE-Controlled

Unit ID	Point ID	Control ID	Description	Site Rating	NOX		CO		VOC (w/HCHO)		HCHO		Total HAP	
					lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Pioneer Compressor Station - Point Source PTE														
CE-01	1E	OxCat-01	Compressor Engine 01 - CAT G3616LE A4	5,350 bhp	4.72	20.66	31.02	135.87	13.15	57.59	2.36	10.33	3.12	13.66
CE-02	2E	OxCat-02	Compressor Engine 02 - CAT G3616LE A4	5,350 bhp	4.72	20.66	31.02	135.87	13.15	57.59	2.36	10.33	3.12	13.66
CE-03	3E	OxCat-03	Compressor Engine 03 - CAT G3616LE A4	5,350 bhp	4.72	20.66	31.02	135.87	13.15	57.59	2.36	10.33	3.12	13.66
CE-04	4E	OxCat-04	Compressor Engine 04 - CAT G3616LE A4	5,350 bhp	4.72	20.66	31.02	135.87	13.15	57.59	2.36	10.33	3.12	13.66
CRP	5E	---	Compressor Rod Packing	5 Compr's	---	---	---	---	5.72	25.07	---	---	0.23	1.02
CBD	6E	FLR-01	Compressor Blowdown (and Shutdown Tests)	5 Compr's	---	---	---	---	43.22	189.30	---	---	1.76	7.71
STAB	25E	FLR-01***	Condensate Stabilizer (Electric Heater)	---	0.80	3.50	2.20	9.62	0.22	0.95	0.02	0.07	0.02	0.11
DFT-01	7E	TO-01	Dehydrator 01 - Flash Tank	125.0 MMscfd	---	---	---	---	45.91	201.07	---	---	1.42	6.20
DSV-01	8E		Dehydrator 01 - Still Vent		---	---	---	---	80.79	353.84	---	---	36.45	159.67
RBV-01	12E	---	Dehydrator 01 - Reboiler	2.00 MMBtu/hr	0.20	0.86	0.16	0.72	0.01	0.05	1E-04	6E-04	4E-03	0.02
DFT-02	9E	TO-01	Dehydrator 02 - Flash Tank	125.0 MMscfd	---	---	---	---	45.91	201.07	---	---	1.42	6.20
DSV-02	10E		Dehydrator 02 - Still Vent		---	---	---	---	80.79	353.84	---	---	36.45	159.67
RBV-02	13E	---	Dehydrator 02 - Reboiler	2.00 MMBtu/hr	0.20	0.86	0.16	0.72	0.01	0.05	1E-04	6E-04	4E-03	0.02
T-01	15E	VRU-01	Storage Tank 01 - Stabilized Condensate	400 bbl	---	---	---	---	0.96	4.20	---	---	0.15	0.66
T-02	16E		Storage Tank 02 - Stabilized Condensate	400 bbl	---	---	---	---	0.96	4.20	---	---	0.15	0.66
T-03	17E		Storage Tank 03 - Stabilized Condensate	400 bbl	---	---	---	---	0.96	4.20	---	---	0.15	0.66
T-04	18E		Storage Tank 04 - Stabilized Condensate	400 bbl	---	---	---	---	0.96	4.20	---	---	0.15	0.66
T-05	19E		Storage Tank 05 - Stabilized Condensate	400 bbl	---	---	---	---	0.96	4.20	---	---	0.15	0.66
T-06	20E		Storage Tank 06 - Stabilized Condensate	400 bbl	---	---	---	---	0.96	4.20	---	---	0.15	0.66
T-07	21E	VRU-01	Storage Tank 07 - Produced Water	400 bbl	---	---	---	---	2E-04	7E-04	---	---	3E-05	1E-04
T-08	22E		Storage Tank 08 - Produced Water	400 bbl	---	---	---	---	2E-04	7E-04	---	---	3E-05	1E-04
TLO	23E	VRU-01	Truck Load-Out - Stabilized Condensate	168,000 bbl/yr	---	---	---	---	0.01	0.07	---	---	0.84	3.70
			Truck Load-Out - Produced Water	30,000 bbl/yr	---	---	---	---	0.01	0.07	---	---	2E-03	0.01
PIG	24E	FLR-01	Pigging Operations (3 Receivers, 1 Launcher)	1,772 events/yr	---	---	---	---	0.21	0.94	---	---	9E-04	4E-03
TO-01	11E	---	DFT/DSV Thermal Oxidizer (Combustion Only)	10.00 MMBtu/hr	No Pre-Controlled Emissions from the Thermal Oxider (TO-01 (11E))									
FLR-01	14E	---	CBD/PIG Elevated Flare (Comb. Only)	8.00 MMBtu/hr	No Pre-Controlled Emissions from the Flare 01 (FLR-01 (14E))									
VRU	---	---	TK/TLO/STAB VRU (Electric Compressor)	---	No Pre-Controlled Emissions from the VRU									
				Total Point Source PTE:	**20.06**	**87.87**	**126.61**	**554.54**	**361.16**	**1,582**	**9.45**	**41.40**	**92.00**	**402.95**
				TVOP Threshold**:	---	100	---	100	---	100	---	na	---	na
Pioneer Compressor Station - Fugitive Source PTE														
FUG-G	1F	LDAR	Process Piping & Equipment Leaks - Gas	4,981 Fittings	---	---	---	---	3.57	15.65	---	---	0.15	0.64
FUG-L	2F		Process Piping & Equipment Leaks - Light Oil	2,271 Fittings	---	---	---	---	4.97	21.77	---	---	0.78	3.43
ECC	3F	---	Engine Crankcase (CE-01 thru -04)	4 Engines	0.05	0.23	0.35	1.51	0.15	0.64	0.03	0.12	0.03	0.15
				Total Fugitive Source PTE:	**0.05**	**0.23**	**0.35**	**1.51**	**8.69**	**38.06**	**0.03**	**0.12**	**0.96**	**4.22**
Pioneer Compressor Station - Total PTE														
				Total Facility-Wide PTE:	**20.12**	**88.10**	**126.95**	**556.05**	**369.85**	**1,620**	**9.48**	**41.52**	**92.96**	**407.17**
				TVOP Threshold**:	---	na	---	na	---	na	---	10	---	25

* = lb/hr is based on 8,760 hr/yr, including Blowdown (BD), Truck Load-Out (TLO), Pigging Operations (PIG), and Flare-01 (FLR-01) operate less frequent.

** = Fugitive emissions of criteria pollutants are not included in major source determination because the facility is not a listed source category.

*** 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).

lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
NOX		CO		VOC (w/HCHO)		HCHO		Total HAP	

Compressor Engine (CE-01 (1E) thru CE-04 (4E))

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-01 (1E) CE-02 (2E) CE-03 (3E) CE-04 (4E) (Each)	Compressor Engines 01 thru 04 (Each) (OxCat-01 thru OxCat-04) Caterpillar (CAT) G3616LE A4 (4SLB) 5,350 bhp (Each) 8,760 hr/yr (Each) 1,000 rpm, 16 cyl 20,698 in3 Displacement 1,294 in3/cyl 799 Exhaust Temp (oF) 32,023 Exhaust Flow (acfm) MFD: > 08/23/11 NSPS JJJJ Affected 7,318 Btu/bhp-hr (HHV) 39.15 MMBtu/hr (HHV) (Each) 38,384 scf/hr (Each) 336.24 MMscf/yr (Each) 1,020 Btu/scf (HHV)	Vendor/Test Data	NOX	0.40	0.12	4.72	20.66	---	**0.40**	**4.72**	**20.66**
		Vendor Data	CO	2.63	0.79	31.02	135.87	92.0%	**0.21**	**2.48**	**10.87**
		Vendor Data	NMNEHC	0.87	0.26	10.26	44.95	64.0%	**0.31**	**3.69**	**16.18**
		Sum	VOC (w/Aldehydes)*	1.11	0.34	13.15	57.59	67.2%	**0.37**	**4.31**	**18.87**
		AP-42 Table 3.2-2	SO2	1.95E-03	5.88E-04	0.02	0.10	---	**2E-03**	**0.02**	**0.10**
		AP-42 Table 3.2-2	PM10/2.5	3.32E-02	9.99E-03	0.39	1.71	---	**0.03**	**0.39**	**1.71**
		AP-42 Table 3.2-2	*Acetaldehyde	2.78E-02	8.36E-03	0.33	1.43	64.0%	**0.01**	**0.12**	**0.52**
		AP-42 Table 3.2-2	*Acrolein	1.71E-02	5.14E-03	0.20	0.88	64.0%	**6E-03**	**0.07**	**0.32**
		AP-42 Table 3.2-2	Benzene	1.46E-03	4.40E-04	0.02	0.08	64.0%	**5E-04**	**0.01**	**0.03**
		AP-42 Table 3.2-2	Butadiene, 1,3-	8.86E-04	2.67E-04	0.01	0.05	64.0%	**3E-04**	**4E-03**	**0.02**
		AP-42 Table 3.2-2	Ethylbenzene	1.32E-04	3.97E-05	2E-03	7E-03	64.0%	**5E-05**	**6E-04**	**2E-03**
		Vendor Data	*Formaldehyde	0.20	0.06	2.36	10.33	**82.0%**	**0.04**	**0.42**	**1.86**
		AP-42 Table 3.2-2	n-Hexane	3.68E-03	1.11E-03	0.04	0.19	64.0%	**1E-03**	**0.02**	**0.07**
		AP-42 Table 3.2-2	Methanol	8.30E-03	2.50E-03	0.10	0.43	64.0%	**3E-03**	**0.04**	**0.15**
		AP-42 Table 3.2-2	POM/PAH	1.24E-03	3.74E-04	0.01	0.06	64.0%	**4E-04**	**0.01**	**0.02**
		AP-42 Table 3.2-2	Toluene	1.35E-03	4.08E-04	0.02	0.07	64.0%	**5E-04**	**0.01**	**0.03**
		AP-42 Table 3.2-2	TMP, 2,2,4-	8.86E-04	2.67E-04	0.01	0.05	64.0%	**3E-04**	**4E-03**	**0.02**
		AP-42 Table 3.2-2	Xylenes	6.11E-04	1.84E-04	0.01	0.03	64.0%	**2E-04**	**3E-03**	**0.01**
		AP-42 Table 3.2-2	Other/Trace HAP	1.06E-03	3.21E-04	0.01	0.05	64.0%	**4E-04**	**0.00**	**0.02**
		AP-42 Table 3.2-2	Total HAP	0.26	0.08	3.12	13.66	77.6%	**0.06**	**0.70**	**3.06**
		Vendor Data	CO2 (GWP=1)	451.00	135.87	5,319	23,299	---	**451.00**	**5,319**	**23,299**
		Vendor Data	CH4 (GWP=25)	1.58	0.48	18.64	81.62	---	**1.58**	**18.64**	**81.62**
		40CFR98 - Table C2	N2O (GWP=298)	7.32E-04	2.20E-04	0.01	0.04	---	**7E-04**	**0.01**	**0.04**
		Weighted Sum	CO2e	490.72	147.83	5,788	25,351	---	**490.72**	**5,788**	**25,351**

* = As per vendor data, the VOC Emission Factor is the sum of NMNEHC plus Aldehydes.

Notes:

1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr. Actual load and operating hours will be less.

2 - As per vendor data, emission values are based on adjustment to specified NOX level, all other emission values are "Not to Exceed" (i.e., Vendor Guarantee).

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-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).

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.

6 - Total NMNEHC, VOC, HCHO, HAP and CO2e emissions include Compressor Rod Packing (CRP), Compressor Blowdown (CBD), Engine Start-up (ESU), and Engine Crankcase (ECC) Emissions:

Description (Each Engine w/ Compressor)	NMNEHC	VOC	HCHO	Tot HAP	CO2e
Engine Operations (See Above)	16.18 tpy	18.87 tpy	1.86 tpy	3.06 tpy	25,351 tpy
Compressor Rod Packing (CRP)	5.78 tpy	5.78 tpy	---	0.24 tpy	307 tpy
Compressor Blowdown (CBD)	0.91 tpy	0.91 tpy	---	0.04 tpy	49 tpy
Engine Start-up (ESU)	Electric or Pneumatic Starters are Utilized				
Engine Crankcase (ECC)	0.13 tpy	0.16 tpy	0.03 tpy	0.04 tpy	70.59 tpy
TOTAL:	**23.00 tpy**	**25.73 tpy**	**1.89 tpy**	**3.37 tpy**	**25,777 tpy**

Compressor Rod Packing (CRP (5E))

Source ID	Unit Description (Compressor Rod Packing)	No of Cylinders	scfh per Cylinder	Contin-gency	Total Fugitive Leak Rate		Pre-Control VOC 15,950 lb/MMscf		Control Efficiency	VOC 15,950 lb/MMscf		CO2 (w/o Control) 200 lb/MMscf		CH4 33,850 lb/MMscf		CO2e CH4 GWP = 25	
					scfh	MMscfy	lb/hr	tpy		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CRP (5E)	Recip Compressor - 01 (Gas Engine)	6	12.0	15%	82.80	0.73	1.32	5.78	na	1.32	5.78	0.02	0.07	2.80	12.28	70.09	306.98
	Recip Compressor - 02 (Gas Engine)	6	12.0	15%	82.80	0.73	1.32	5.78		1.32	5.78	0.02	0.07	2.80	12.28	70.09	306.98
	Recip Compressor - 03 (Gas Engine)	6	12.0	15%	82.80	0.73	1.32	5.78		1.32	5.78	0.02	0.07	2.80	12.28	70.09	306.98
	Recip Compressor - 04 (Gas Engine)	6	12.0	15%	82.80	0.73	1.32	5.78		1.32	5.78	0.02	0.07	2.80	12.28	70.09	306.98
	Stabilizer Recip Compressor - (Elect)	2	12.0	15%	27.60	0.24	0.44	1.93		0.44	1.93	6E-03	0.02	0.93	4.09	23.36	102.33
				TOTAL:	**358.80**	**3.14**	**5.72**	**25.07**	**TOTAL:**	**5.72**	**25.07**	**0.07**	**0.31**	**12.15**	**53.20**	**303.71**	**1,330**
				Pre-Control:	358.80	3.14	5.72	25.07	Pre-Cont:	5.72	25.07	0.07	0.31	12.15	53.20	303.71	1,330

Source ID	Unit Description (Compressor Rod Packing)	Benzene 25.00 lb/MMscf		E-Benzene 25.00 lb/MMscf		Hexane, n- 500 lb/MMscf		Methanol 25.00 lb/MMscf		Toluene 25.00 lb/MMscf		TMP, 2,2,4- 25.00 lb/MMscf		Xylene 25.00 lb/MMscf		Tot HAP 650 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
CRP (5E)	Recip Compressor - 01 (Gas Engine)	2E-03	0.01	2E-03	0.01	0.04	0.18	2E-03	0.01	2E-03	0.01	2E-03	0.01	2E-03	0.01	0.05	0.24
	Recip Compressor - 02 (Gas Engine)	2E-03	0.01	2E-03	0.01	0.04	0.18	2E-03	0.01	2E-03	0.01	2E-03	0.01	2E-03	0.01	0.05	0.24
	Recip Compressor - 03 (Gas Engine)	2E-03	0.01	2E-03	0.01	0.04	0.18	2E-03	0.01	2E-03	0.01	2E-03	0.01	2E-03	0.01	0.05	0.24
	Recip Compressor - 04 (Gas Engine)	2E-03	0.01	2E-03	0.01	0.04	0.18	2E-03	0.01	2E-03	0.01	2E-03	0.01	2E-03	0.01	0.05	0.24
	Stabilizer Recip Compressor - (Elect)	7E-04	3E-03	7E-04	3E-03	0.01	0.06	7E-04	3E-03	7E-04	3E-03	7E-04	3E-03	7E-04	3E-03	0.02	0.08
	TOTAL:	**0.01**	**0.04**	**0.01**	**0.04**	**0.18**	**0.79**	**0.01**	**0.04**	**0.01**	**0.04**	**0.01**	**0.04**	**0.01**	**0.04**	**0.23**	**1.02**
	Pre-Control:	0.01	0.04	0.01	0.04	0.18	0.79	0.01	0.04	0.01	0.04	0.01	0.04	0.01	0.04	0.23	1.02

Notes: 1 - 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 estimate of 12 scfh/cylinder.

2 - The results of a representative **Inlet Gas Analysis** were used to determine the following worst-case components (See Attachment S6 - Lab Analysis):

	Min. Contingency:	10% VOC and GHG		
Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
CO2	110 lb/MMscf	**200 lb/MMscf**	0.341	1.254
Methane (CH4)	30,734 lb/MMscf	**33,850 lb/MMscf**	57.765	212.226
N2/Water/Ethane/Etc	13,209 lb/MMscf	**8,600 lb/MMscf**	14.676	53.918
VOC	14,481 lb/MMscf	**15,950 lb/MMscf**	27.218	100.000
TOTAL Gas	58,535 lb/MMscf	**58,600 lb/MMscf**	100.000	---
Benzene	5.35 lb/MMscf	**25 lb/MMscf**	0.043	0.157
Ethylbenzene	0.84 lb/MMscf	**25 lb/MMscf**	0.043	0.157
Hexane, n-	395.58 lb/MMscf	**500 lb/MMscf**	0.853	3.135
Methanol (MeOH)	0 lb/MMscf	**25 lb/MMscf**	0.043	0.157
Toluene	9.47 lb/MMscf	**25 lb/MMscf**	0.043	0.157
TMP, 2,2,4-	6.62 lb/MMscf	**25 lb/MMscf**	0.043	0.157
Xylenes	15.67 lb/MMscf	**25 lb/MMscf**	0.043	0.157
Total HAP	434 lb/MMscf	**650 lb/MMscf**	1.109	4.075

Compressor Blowdown / Emergency Shutdown (CBD (6E))

Source ID	Unit Description	Site Rating	Emission Factor	Blowdown Gas	Blowdown and ESD	Total Gas Vented	Pre-Control VOC 15,950 Gas lb/MMscf		FLR-01 Control %	VOC 15,950 Gas lb/MMscf		CO2 (w/o Control) 200 Gas lb/MMscf		CH4 33,850 Gas lb/MMscf		CO2e CH4 GWP = 25	
		bhp	scf/bhp	scf/Event	Events/yr	Mscf/yr	lb/hr	tpy		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CBD (6E)	Recip Comp - 01 (Gas Engine) (CBD)	5,350	10.23	54,732	104	5,692	10.36	45.39	98.0%	0.21	0.91	0.13	0.57	0.44	1.93	11.13	48.74
	Recip Comp - 02 (Gas Engine) (CBD)	5,350	10.23	54,732	104	5,692	10.36	45.39		0.21	0.91	0.13	0.57	0.44	1.93	11.13	48.74
	Recip Comp - 03 (Gas Engine) (CBD)	5,350	10.23	54,732	104	5,692	10.36	45.39		0.21	0.91	0.13	0.57	0.44	1.93	11.13	48.74
	Recip Comp - 04 (Gas Engine) (CBD)	5,350	10.23	54,732	104	5,692	10.36	45.39		0.21	0.91	0.13	0.57	0.44	1.93	11.13	48.74
	Recip Comp - 05 (Electric Motor) (CBD)	25	6.22	155.50	6	0.93	2E-03	0.01		3E-05	1E-04	2E-05	9E-05	7E-05	0.00	0.00	0.01
	Emergency Shutdown (ESD) Testing	21,425	45.13	967,000	1	967	1.76	7.71		0.04	0.15	0.02	0.10	0.07	0.33	1.89	8.28
Assumes 1 hr/Event				**TOTAL:**	**423**	**23,736**	**43.22**	**189.30**	**TOTAL:**	**0.86**	**3.79**	**0.54**	**2.37**	**1.83**	**8.03**	**46.40**	**203.24**
									Pre-Control:	43.22	189.30	0.54	2.37	91.72	402	2,294	10,046

Source ID	Unit Description	Benzene 25.00 Gas lb/MMscf		Ethylbenzene 25.00 Gas lb/MMscf		Hexane, n- 500.00 Gas lb/MMscf		Methanol 25.00 Gas lb/MMscf		Toluene 25.00 Gas lb/MMscf		TMP, 2,2,4- 25.00 Gas lb/MMscf		Xylene 25.00 Gas lb/MMscf		Total HAP 650.00 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
CBD (6E)	Recip Comp - 01 (Gas Engine) (CBD)	3E-04	1E-03	3E-04	1E-03	6E-03	0.03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	8E-03	0.04
	Recip Comp - 02 (Gas Engine) (CBD)	3E-04	1E-03	3E-04	1E-03	6E-03	0.03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	8E-03	0.04
	Recip Comp - 03 (Gas Engine) (CBD)	3E-04	1E-03	3E-04	1E-03	6E-03	0.03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	8E-03	0.04
	Recip Comp - 04 (Gas Engine) (CBD)	3E-04	1E-03	3E-04	1E-03	6E-03	0.03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	8E-03	0.04
	Recip Comp - 05 (Electric Motor) (CBD)	5E-08	2E-07	5E-08	2E-07	1E-06	5E-06	5E-08	2E-07	5E-08	2E-07	5E-08	2E-07	5E-08	2E-07	1E-06	6E-06
	Emergency Shutdown (ESD) Testing	6E-05	2E-04	6E-05	2E-04	1E-03	5E-03	6E-05	2E-04	6E-05	2E-04	6E-05	2E-04	6E-05	2E-04	1E-03	6E-03
Assumes 1 hr/Event	**TOTAL:**	**1E-03**	**0.01**	**1E-03**	**0.01**	**0.03**	**0.12**	**1E-03**	**0.01**	**1E-03**	**0.01**	**1E-03**	**0.01**	**1E-03**	**0.01**	**0.04**	**0.15**
	Pre-Control:	0.07	0.30	0.07	0.30	1.35	5.93	0.07	0.30	0.07	0.30	0.07	0.30	0.07	0.30	1.76	7.71

Notes: 1 - The results of a representative **Inlet Gas Analysis** were used to determine the following worst-case components (See Attachment S4 - Lab Analysis):

	Min. Contingency:	10% VOC and GHG		
Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
CO2	110 lb/MMscf	**200 lb/MMscf**	0.34	1.25
Methane (CH4)	30,734 lb/MMscf	**33,850 lb/MMscf**	57.76	212.23
N2/Water/Ethane/Etc	13,209 lb/MMscf	**8,600 lb/MMscf**	14.68	53.92
VOC	14,481 lb/MMscf	**15,950 lb/MMscf**	27.22	100.00
TOTAL Gas	58,535 lb/MMscf	**58,600 lb/MMscf**	100.000	---

Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
Benzene	5.35 lb/MMscf	**25 lb/MMscf**	0.04	0.16
Ethylbenzene	0.84 lb/MMscf	**25 lb/MMscf**	0.04	0.16
Hexane, n-	396 lb/MMscf	**500 lb/MMscf**	0.85	3.13
Methanol (MeOH)	0 lb/MMscf	**25 lb/MMscf**	0.04	0.16
Toluene	9.47 lb/MMscf	**25 lb/MMscf**	0.04	0.16
TMP, 2,2,4-	6.62 lb/MMscf	**25 lb/MMscf**	0.04	0.16
Xylenes	16 lb/MMscf	**25 lb/MMscf**	0.04	0.16
Total HAP	434 lb/MMscf	**650 lb/MMscf**	1.11	4.08

2 - Compressor engine, pigging and station ESD blowdown volumes provided by Engineering Department. Compressor engine blowdown volume assumed the same as Dunbar station in New York.

Compressor Engine	**54,732** scf/blowdown	**Motor Driven Compressor**	**6.22** scf/bhp-hr	**Station ESD**	**967,000** scf/blowdown

3 - Estimates are conservatively based on:

2	**Gas Compressor Blowdowns each week =**	**104 Events/yr**
6	**Elect. Compressor Blowdowns each year =**	**6 Events/yr**
1	**Emergency Shut Down Test each year =**	**1 Event/yr**

Condensate Stabilizer (STAB, 25E)

Source ID	Unit Description	Site Rating	Stabilizer Overheads Volume	Operating Time	Total Gas Vented	Pre-Control VOC 91,252 Gas lb/MMscf		FLR-01 Control %	VOC 91,252 Gas lb/MMscf		CO2 (w/o Control) 106 Gas lb/MMscf		CH4 8,995 Gas lb/MMscf		CO2e CH4 GWP = 25	
		bhp	scf/hr	hr/yr	Mscf/yr	lb/hr*	tpy		lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
STAB (25E)	Condensate Stabilizer	25	5,726	120	687.12	522.51	31.35	98.0%	10.45	0.63	0.01	0.04	1.03	0.06	25.76	1.58
* lb/hr based on 120 hr/yr.			**TOTAL:**		**687.12**	**522.51**	**31.35**	**TOTAL:**	**10.45**	**0.63**	**0.01**	**0.04**	**1.03**	**0.06**	**25.76**	**1.58**
						Pre-Control:			522.51	31.35	0.01	0.04	0.71	3.09	17.65	77.29

Source ID	Unit Description	Benzene 13.09 Gas lb/MMscf		Ethylbenzene 33.57 Gas lb/MMscf		n-Hexane 1,282.13 Gas lb/MMscf		Methanol 0.10 Gas lb/MMscf		Toluene 52 Gas lb/MMscf		2,2,4-TMP 38.65 Gas lb/MMscf		Xylene 40.29 Gas lb/MMscf		Total HAP 1,459 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 (25E)	Condensate Stabilizer	1E-03	9E-05	4E-03	2E-04	0.15	0.01	1E-05	7E-07	0.01	4E-04	4E-03	3E-04	0.00	3E-04	0.17	0.01
* lb/hr based on 120 hr/yr.	**TOTAL:**	**1E-03**	**9E-05**	**4E-03**	**2E-04**	**0.15**	**0.01**	**1E-05**	**7E-07**	**0.01**	**4E-04**	**4E-03**	**3E-04**	**0.00**	**3E-04**	**0.17**	**0.01**
	Pre-Control:	0.07	4E-03	0.19	0.01	7.34	0.44	6E-04	3E-05	0.30	0.02	0.22	0.01	0.23	0.01	8.36	0.50

Notes:

1 - The results of a representative **Condensate Stabilizer Overheads Analysis** were used to determine the following worst-case components (See Appendix S4 - Wet Gas Summary):

Pollutant	Wet Gas	Worst Case	%Total	%VOC
CO2	88.25 lb/MMscf	**105.91 lb/MMscf**	0.09	0.12
Methane (CH4)	7,496 lb/MMscf	**8,995 lb/MMscf**	7.40	9.86
N2/Water/Ethane/Etc	21,153 lb/MMscf	**21,153 lb/MMscf**	17.41	23.18
VOC	76,043 lb/MMscf	**91,252 lb/MMscf**	75.10	100.00
TOTAL Gas	104,780 lb/MMscf	**121,506 lb/MMscf**	100.00	---

Pollutant	Wet Gas	Worst Case	%Total	%VOC
Benzene	10.91 lb/MMscf	**13.09 lb/MMscf**	0.01	0.01
Ethylbenzene	27.98 lb/MMscf	**33.57 lb/MMscf**	0.03	0.04
n-Hexane	1,068 lb/MMscf	**1,282 lb/MMscf**	1.06	1.41
Methanol (MeOH)	0.08 lb/MMscf	**0.10 lb/MMscf**	0.00	0.00
Toluene	42.98 lb/MMscf	**51.57 lb/MMscf**	0.04	0.06
2,2,4-TMP	32.21 lb/MMscf	**38.65 lb/MMscf**	0.03	0.04
Xylenes	33.57 lb/MMscf	**40.29 lb/MMscf**	0.03	0.04
Total HAP	1,216 lb/MMscf	**1,459 lb/MMscf**	1.20	1.60

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.

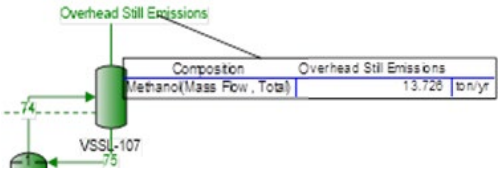
Dehydrators (DFT-01/-02 (7E/9E) and DSV-01/-02 (8E/10E))

Unit ID	Description	Capacity	Reference	Pollutant	GRI-GLYCalc Pre-Control Emissions		Worst-Case Pre-Control 20% Margin Emissions	Worst-Case Pre-Control 0% Margin	T-Ox Control %	Controlled Emissions	
					lb/hr	tpy	lb/hr	tpy		lb/hr	tpy
DFT-01 (7E) DFT-01 (9E) (Each)	Dehydrator 01 Flash Tank Dehydrator 02 Flash Tank Flash Tank Off-Gas Controlled by 99.5% Thermal Oxidizer (TO-01) (Each)	Flow Rate 125.0 MMscfd 8,760 hr/yr	GRI-GLYCalc 4.0	VOC	38.26	167.56	45.91	201.07	99.5%	**0.23**	**1.01**
			GRI-GLYCalc 4.0	Benzene	0.03	0.13	0.03	0.15		**2E-04**	**8E-04**
			GRI-GLYCalc 4.0	Ethylbenzene	2E-03	0.01	3E-03	0.01		**1E-05**	**6E-05**
			GRI-GLYCalc 4.0	Hexane, n-	1.05	4.60	1.26	5.52		**0.01**	**0.03**
			Process Simulation	Methanol	0.01	0.04	0.01	0.05		**6E-05**	**2E-04**
			GRI-GLYCalc 4.0	Toluene	0.04	0.18	0.05	0.21		**2E-04**	**1E-03**
			GRI-GLYCalc 4.0	TMP, 2,2,4-	0.01	0.05	0.01	0.06		**1E-05**	**6E-05**
			GRI-GLYCalc 4.0	Xylenes	0.04	0.17	0.05	0.21		**2E-04**	**1E-03**
			GRI-GLYCalc 4.0	Tot HAP	1.18	5.17	1.42	6.20		**0.01**	**0.03**
			GRI-GLYCalc 4.0	CO2	1.02	4.47	1.22	5.36	---	**1.22**	**5.36**
			GRI-GLYCalc 4.0	CH4	28.36	124.23	34.04	149.08	99.5%	**0.17**	**0.75**
			40CFR98 - Table A-1	CO2e	710.11	3,110	852.13	3,732	99.4%	**5.48**	**24.00**
DSV-02 (08E) DSV-02 (10E) (Each)	Dehydrator 01 Still Vent Dehydrator 02 Still Vent Still Vent Off-Gas Controlled by 99.5% Thermal Oxidizer (TO-01) (Each)	Flow Rate 125.0 MMscfd 8,760 hr/yr	GRI-GLYCalc 4.0	VOC	67.32	294.87	80.79	353.84	99.5%	**0.40**	**1.77**
			GRI-GLYCalc 4.0	Benzene	2.57	11.27	3.09	13.52		**0.02**	**0.07**
			GRI-GLYCalc 4.0	Ethylbenzene	0.59	2.61	0.71	3.13		**4E-03**	**0.02**
			GRI-GLYCalc 4.0	Hexane, n-	2.98	13.07	3.58	15.69		**0.02**	**0.08**
			Process Simulation	Methanol	3.13	13.73	3.76	16.47		**0.02**	**0.08**
			GRI-GLYCalc 4.0	Toluene	5.82	25.49	6.98	30.59		**0.03**	**0.15**
			GRI-GLYCalc 4.0	TMP, 2,2,4-	0.03	0.15	0.04	0.17		**0.00**	**0.02**
			GRI-GLYCalc 4.0	Xylenes	15.24	66.75	18.29	80.10		**0.09**	**0.40**
			GRI-GLYCalc 4.0	Tot HAP	30.38	133.06	36.45	159.67		**0.19**	**0.81**
			GRI-GLYCalc 4.0	CO2	0.78	3.42	0.94	4.10	---	**0.94**	**4.10**
			GRI-GLYCalc 4.0	CH4	1.62	7.10	1.94	8.51	99.5%	**0.01**	**0.04**
			40CFR98 - Table A-1	CO2e	41.28	180.80	49.53	216.96	97.6%	**1.18**	**5.17**
DHY-01 (Total) DHY-02 (Total) (Each)	Dehydrator 01 (Total) Dehydrator 02 (Total) (Each)	Flow Rate 125.0 MMscfd 8,760 hr/yr	GRI-GLYCalc 4.0	VOC	105.58	462.43	126.69	554.92	99.5%	**0.63**	**2.77**
			GRI-GLYCalc 4.0	Benzene	2.60	11.40	3.12	13.68		**0.02**	**0.07**
			GRI-GLYCalc 4.0	Ethylbenzene	0.60	2.62	0.72	3.14		**4E-03**	**0.02**
			GRI-GLYCalc 4.0	Hexane, n-	4.03	17.67	4.84	21.20		**0.02**	**0.11**
			Process Simulation	Methanol	3.14	13.77	3.77	16.52		**2E-02**	**0.08**
			GRI-GLYCalc 4.0	Toluene	5.86	25.66	7.03	30.80		**0.04**	**0.15**
			GRI-GLYCalc 4.0	TMP, 2,2,4-	0.04	0.19	0.05	0.23		**4E-03**	**0.02**
			GRI-GLYCalc 4.0	Xylenes	15.28	66.92	18.33	80.30		**0.09**	**0.40**
			GRI-GLYCalc 4.0	Tot HAP	31.56	138.23	37.87	165.87		**0.19**	**0.84**
			GRI-GLYCalc 4.0	CO2	1.80	7.89	2.16	9.47	---	**2.16**	**9.47**
			GRI-GLYCalc 4.0	CH4	29.98	131.33	35.98	157.59	99.5%	**0.18**	**0.79**
			40CFR98 - Table A-1	CO2e	751.39	3,291	902	3,949	99.3%	**6.66**	**29.17**

Notes: 1 - GRI-GLYCalc V4.0 used 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:

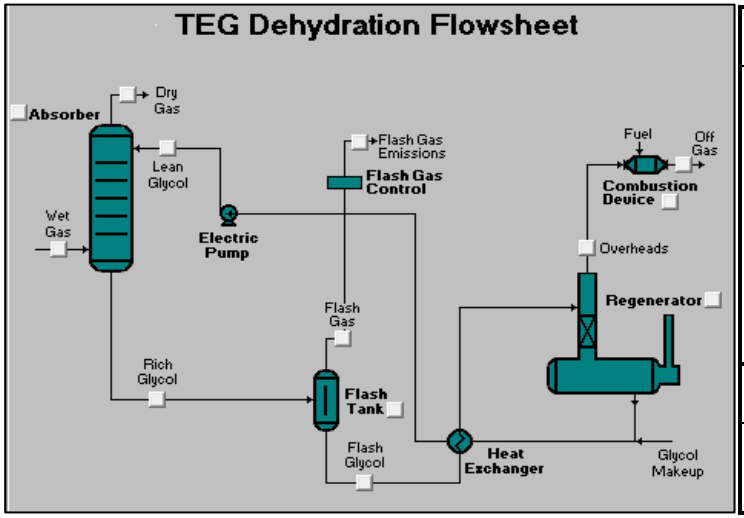
Inlet Gas:	80 oF and 1,000 psig, H2O Saturated	Primary Glycol Pump:	Electric/Pneumatic - 20 gpm
Inlet Gas Analysis:	See Supplement S1 - Inlet Gas Summary	Backup Glycol Pump:	Kimray Gas-Assist - 7.5 gpm
Dry Gas:	125.0 MMscfd, 7.0 lb-H2O/MMscf	Flash Tank:	110 oF, 60 psig, 99.5% TO-01
Lean Glycol:	1.5 wt% H2O	Stripping Gas:	None
		Regen Control:	99.5% TO-01



3 - A contingency has been added to the GRI-GLYCalc model results to account for potential future changes in gas composition.

Dehydrators 01 and 02 (Summary) – 125.0 MMscfd

Unit ID	Description	Reference	Pollutant	GRI-GLYCalc Results		W/ 20% Margin		Control Eff	Controlled Emissions	
				lb/hr	tpy	lb/hr	tpy	%	lb/hr	tpy
DEHY-01 (7E/8E) DEHY-02 (9E/10E)	Dehydrator 01 Dehydrator 02 Sum of Flash Tank and Still Vent - (Flash Tank Offgas and Still Vent Controlled w/ Thermal Oxidizer) 125.0 MMscfd 8,760 Hr/yr 45,625 MMscf/yr 5.21 MMscf/hr NESHAP HH - Exempt	---	NOX	---	---	---	---	---	---	---
		---	CO	---	---	---	---	---	---	---
		GRI-GLYCalc 4.0	VOC	105.58	462.43	126.69	554.92	99.5%	**0.63**	**2.77**
		---	SO2	---	---	---	---	---	---	---
		---	PM10/2.5	---	---	---	---	---	---	---
		GRI-GLYCalc 4.0	Benzene	2.60	11.40	3.12	13.68	99.5%	**0.02**	**0.07**
		GRI-GLYCalc 4.0	Ethylbenzene	0.60	2.62	0.72	3.14		**4E-03**	**0.02**
		---	HCHO	---	---	---	---		---	---
		GRI-GLYCalc 4.0	n-Hexane	4.03	17.67	4.84	21.20		**0.02**	**0.11**
		---	Methanol	3.14	13.77	3.77	16.52		**0.02**	**0.08**
		GRI-GLYCalc 4.0	Toluene	5.86	25.66	7.03	30.80		**0.04**	**0.15**
		GRI-GLYCalc 4.0	2,2,4-TMP	0.04	0.19	0.05	0.23		**3E-04**	**1E-03**
		GRI-GLYCalc 4.0	Xylenes	15.28	66.92	18.33	80.30		**0.09**	**0.40**
		---	Other HAP	---	---	---	---		---	---
		GRI-GLYCalc 4.0	Total HAP	31.56	138.23	37.87	165.87		**37.87**	**0.83**
		---	CO2	1.80	7.89	2.16	9.47	---	**2.16**	**9.47**
		GRI-GLYCalc 4.0	CH4	29.98	131.33	35.98	157.59	99.5%	**0.18**	**0.79**
		---	N2O	---	---	---	---	---	---	---
		40CFR98 - Table A-1	CO2e	751.39	3,291	901.66	3,949	99.3%	**6.66**	**29.17**



*Dehydrator Operating Parameters			
Dry Gas Flow Rate:	**125.0 MMscfd**	Extended Gas Analysis:	Pioneer 10/28/19
Wet Gas Temperature:	**80 oF**	Flash Tank Temperature:	**110 oF**
Wet Gas Pressure:	**1,000 psig**	Flash Tank Pressure:	**60 psig**
Wet Gas Water Content:	Saturated	Flash Tank Off-Gas:	**99.5% TO-01**
Dry Gas Water Content:	7.0 lb H2O/MMscf	Stripping Gas:	na
Lean Glycol Water Content:	1.5 wt% H2O	Stripping Gas Flow Rate:	na
Glycol Pump Type:	**Electric**	Regen Overhead Control:	**99.5% TO-01**
Glycol Pump Model:	na	Condenser Temperature:	na
Lean Glycol Circulation Rate:	**20.00 gpm**	Condenser Pressure:	na
Note: Each dehydrator equipped with an electric glycol pump (primary) and gas-assist pump (backup).			

Additional GRI-GLYCalc 4.0 Model Results:			
Flash Tank Off-Gas Flow:	**1,320 scfh**	Wet Gas Water Content:	0.068 Vol%
Regen Overhead Stream:	**3,860 scfh**	Dry Gas Water Content:	0.003 Vol%
Lean Glycol Recirc Ratio:	7.4 gal/lb-H2O	Rich Glycol Water Content:	2.850 wt%

Reboilers (RBV-01/-02) (12E/13E))

Source ID	Description	Reference	Pollutant	Emission Factor		Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy
RBV-01 (12E) RBV-02 (13E)	Dehydrator Reboiler 01 Dehydrator Reboiler 02 2.00 MMBtu/hr (HHV) (ea) 1,020 Btu/scf (HHV) 8,760 hr/yr 1,961 scf/hr 47.06 Mscfd 17.18 MMscf/yr	EPA AP-42 Table 1.4-1	NOX	100	9.80E-02	**0.20**	**0.86**
		EPA AP-42 Table 1.4-1	CO	84	8.24E-02	**0.16**	**0.72**
		EPA AP-42 Table 1.4-2	NMNEHC	5.4	5.32E-03	**0.01**	**0.05**
		EPA AP-42 Table 1.4-2	VOC	5.5	5.39E-03	**0.01**	**0.05**
		EPA AP-42 Table 1.4-2	SO2	0.6	5.88E-04	**1E-03**	**0.01**
		EPA AP-42 Table 1.4-2	PM10/2.5	7.6	7.45E-03	**0.01**	**0.07**
		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	**4E-06**	**2E-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	**1E-04**	**6E-04**
		EPA AP-42 Table 1.4-3	Hexane, n-	1.80	1.76E-03	**4E-03**	**0.02**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	POM/PAH	6.98E-04	6.85E-07	**1E-06**	**6E-06**
		EPA AP-42 Table 1.4-3	Toluene	3.40E-03	3.33E-06	**7E-06**	**3E-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	**2E-06**	**1E-05**
		SUM	Total HAP	1.88	1.85E-03	**4E-03**	**0.02**
		EPA AP-42 Table 1.4-3	CO2 (GWP=1)	118	117.65	**235.29**	**1,031**
		EPA AP-42 Table 1.4-3	CH4 (GWP=25)	2.30	2.25E-03	**5E-03**	**0.02**
		EPA AP-42 Table 1.4-3	N2O (GWP=298)	2.20	2.16E-03	**4E-03**	**2E-02**
		40CFR98 - Table A-1	CO2e	831	118.35	**236.69**	**1,037**

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr. Actual load and operating hours will be less.
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 and Produced Water - Storage Tank (TK-01 (15E) thru TK-08 (22E))

Unit ID	Material Stored	Capacity	Turn-Overs/yr	Thruput	Tanks 4.0.9d (Pre-Control)				Control Efficiency (VRU)	VOC 100.00 %VOC		CO2 (w/o Control) --- VOC		CH4 --- VOC		CO2e CH4 GWP = 25	
					Working	Breathing	Total										
		bbl		bbl/yr	lb/yr	lb/yr	lb/yr	tpy/yr		lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
TK-01 (15E)	Stabilized Condensate	400	70	28,000	6,303	2,099	8,402	4.20	98.0%	0.02	0.08	Negligible GHG Emissions from Stabilized Condensate (SC)					
TK-02 (16E)	Stabilized Condensate	400	70	28,000	6,303	2,099	8,402	4.20		0.02	0.08						
TK-03 (17E)	Stabilized Condensate	400	70	28,000	6,303	2,099	8,402	4.20		0.02	0.08						
TK-04 (18E)	Stabilized Condensate	400	70	28,000	6,303	2,099	8,402	4.20		0.02	0.08						
TK-05 (19E)	Stabilized Condensate	400	70	28,000	6,303	2,099	8,402	4.20		0.02	0.08						
TK-06 (20E)	Stabilized Condensate	400	70	28,000	6,303	2,099	8,402	4.20		0.02	0.08						
TK-07 (21E)	Produced Water	400	38	15,000	69.75	---	69.75	0.03		2E-04	7E-04	Negligible GHG Emissions from Produced Water (PW)					
TK-08 (22E)	Produced Water	400	38	15,000	69.75	---	69.75	0.03		2E-04	7E-04						
* lb/hr based on 8,760 hr/yr.	**TOTAL:**	**3,200**		**198,000**				25.28	**TOTAL:**	**0.12**	**0.51**	---	---	---	---	---	---
									PRE-Control SC/TK:	0.96	25.21	---	---	---	---	---	---
									PRE-Control PW/TK:	2E-04	1E-03	---	---	---	---	---	---

Unit ID	Material Stored	Benzene 0.09 %VOC		Ethylbenzene 2.28 %VOC		n-Hexane (C6) 8.42 %VOC		Methanol (MeOH) 9E-02 %VOC		Toluene (C7) 1.15 %VOC		2,2,4-TMP 0.77 %VOC		Xylenes (C8) 2.98 %VOC		Total HAP 15.78 %VOC	
		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 (15E)	Stabilized Condensate	2E-05	7E-05	4E-04	2E-03	2E-03	0.01	2E-05	7E-05	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	3E-03	0.01
TK-02 (16E)	Stabilized Condensate	2E-05	7E-05	4E-04	2E-03	2E-03	0.01	2E-05	7E-05	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	3E-03	0.01
TK-03 (17E)	Stabilized Condensate	2E-05	7E-05	4E-04	2E-03	2E-03	0.01	2E-05	7E-05	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	3E-03	0.01
TK-04 (18E)	Stabilized Condensate	2E-05	7E-05	4E-04	2E-03	2E-03	0.01	2E-05	7E-05	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	3E-03	0.01
TK-05 (19E)	Stabilized Condensate	2E-05	7E-05	4E-04	2E-03	2E-03	0.01	2E-05	7E-05	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	3E-03	0.01
TK-06 (20E)	Stabilized Condensate	2E-05	7E-05	4E-04	2E-03	2E-03	0.01	2E-05	7E-05	2E-04	1E-03	1E-04	6E-04	6E-04	3E-03	3E-03	0.01
TK-07 (21E)	Produced Water	1E-07	6E-07	4E-06	2E-05	1E-05	6E-05	1E-07	6E-07	2E-06	8E-06	1E-06	5E-06	5E-06	2E-05	3E-05	1E-04
TK-08 (22E)	Produced Water	1E-07	6E-07	4E-06	2E-05	1E-05	6E-05	1E-07	6E-07	2E-06	8E-06	1E-06	5E-06	5E-06	2E-05	3E-05	1E-04
TOTAL:	**TOTAL:** **TOTAL:**	**1E-04**	**4E-04**	**3E-03**	**0.01**	**0.01**	**0.04**	**1E-04**	**4E-04**	**1E-03**	**0.01**	**9E-04**	**4E-03**	**3E-03**	**0.02**	**0.02**	**0.08**
	PRE-SC/TK:	8E-04	0.02	0.02	0.57	0.08	2.12	8E-04	2E-02	0.01	0.29	0.01	0.19	0.03	0.75	0.15	3.98
	PRE-PW/TK:	1E-07	1E-06	4E-06	3E-05	1E-05	1E-04	1E-07	1E-06	2E-06	2E-05	1E-06	1E-05	5E-06	4E-05	3E-05	2E-04

* lb/hr based on 8,760 hr/yr.

Notes: 1 - The results of EPA Tanks 4.0.9d emission program was used to determine the Working Loss, Breathing Loss, and Total Emissions of Pre-Controlled VOC. (See Appendix S4 - Emission Programs)

Emissions Report for: Annual

AMS-Pioneer- 400 bbl Stabilized Condensate - Vertical Fixed Roof Tank
Moundsville, Ohio

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 12)	6,302.71	2,099.36	8,402.07

Vapor Recovery Units

- The registrant may claim a capture and control efficiency of 95% (which accounts for 5% expected downtime).
- The registrant may claim a capture and control efficiency of 98% if the VRU has a backup flare that meet the requirements of section 7.1.2 of this general permit.

2 - It is estimated that each stabilized condensate tank will be emptied up to: **70** t-o/yr = **28,000** bbl/yr

3 - It is estimated that each produced water tank will be emptied up to: **38** t-o/yr = **15,000** bbl/yr

4 - It is projected each stabilized condensate storage tank will have an average throughput of 38,000 bbl/yr; however, it is possible that all product (228,000 bbl/yr) could be moved through one tank.

5 - It is projected each produced water storage tank will have an average throughput of 15,000 bbl/yr; however, it is possible that all product (30,000 bbl/yr) could be moved through one tank.

Stabilized Condensate and Produced Water - Truck Load-Out (TLO (23E))

Source ID	Description	S	P	M	T	Control Efficiency (VRU)	L_L	VOC T-Put	VOC 100% Condensate 5% Produced Water		CO2		CH4		CO2e	
		sat. fac.	psia	lb/lb-mol	°R	%	lb/Mgal	Mgal/yr	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
TLO (23E)	Stabilized Condensate	0.60	7.00	64.00	507	68.6%	2.07	7,056	1.67	7.32	Negligible GHG Emissions from Stabilized Condensate (SC)					
	Produced Water							63.00	0.01	0.07	Negligible GHG Emissions from Produced Water (PW)					
* lb/hr is averaged over 8,760 hr/yr							**TOTAL:**	**7,119**	**1.69**	**7.38**	---	---	---	---	---	---
							PRE-Control:		5.34	23.37	---	---	---	---	---	---

Source ID	Benzene 0.09 %VOC		Ethylbenzene 2.28 %VOC		n-Hexane (C6) 8.42 %VOC		Methanol 9E-02 %VOC		Toluene (C7) 1.15 %VOC		2,2,4-TMP 0.77 %VOC		Xylenes (C8) 2.98 %VOC		Total HAP 15.78 %VOC	
	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
TLO (23E)	1E-03	0.01	0.04	0.17	0.14	0.62	1E-03	0.01	0.02	0.08	0.01	0.06	0.05	0.22	0.26	1.15
	1E-05	6E-05	3E-04	1E-03	1E-03	0.01	1E-05	6E-05	2E-04	7E-04	1E-04	5E-04	4E-04	2E-03	2E-03	0.01
TOTAL:	**1E-03**	**0.01**	**0.04**	**0.17**	**0.14**	**0.62**	**1E-03**	**7E-03**	**0.02**	**0.08**	**0.01**	**0.06**	**0.05**	**0.22**	**0.27**	**1.16**
PRE-Control:	5E-03	0.02	0.12	0.54	0.45	1.98	5E-03	2E-02	0.06	0.27	0.04	0.18	0.16	0.70	0.85	3.71

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 (70% collection efficiency x 98% FLR).

2 - Vapor pressure (P), molecular weight (M), and temperature (T) derived from EPA TANKS 4.0.9d. (See Attachment S6 - Emission Program Results.)

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
Stabilized Condensate	All	56.69	48.70	64.69	52.55	5.1274	4.3813	5.9667	60.4958			95.06

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
Produced Water	All	60.00	60.00	60.00	60.00	0.3366	0.3366	0.3366	28.3885			18.77

3 - Truck Loadout Collection Efficiency derived from WV-DEP General Permit G35-G Engineering Evaluation / Fact Sheet:

Truck Loadout Collection Efficiencies

The following applicable capture efficiencies of a truck loadout are allowed:

- For tanker trucks passing the MACT level annual leak test – 99.2%
- For tanker trucks passing the NSPS level annual leak test – 98.7%
- For tanker trucks not passing one of the annual leak tests listed above – 70%

Pigging Operations (PIG (24E)

Source ID	Unit Description	Blowdown Volume	Blowdown Frequency	Total Gas Vented	Pre-Control VOC 15,950 Gas lb/MMscf		FLR-01 Control %	VOC 15,950 Gas lb/MMscf		CO2 (w/o Control) 200 Gas lb/MMscf		CH4 33,850 Gas lb/MMscf		CO2e CH4 GWP = 25	
		scf/Event	Events/yr	Mscf/yr	lb/hr	tpy		lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
PIG (24E)	16" Pig Receiver A	3,823	730	2,791	5.08	22.26	98.0%	0.10	0.45	0.06	0.28	0.22	0.94	5.46	23.90
	16" Pig Receiver B	3,823	156	596	1.09	4.76		0.02	0.10	0.01	0.06	0.05	0.20	1.17	5.11
	16" Pig Receiver C	3,823	156	596	1.09	4.76		0.02	0.10	0.01	0.06	0.05	0.20	1.17	5.11
	16" Pig Launcher	8,064	730	5,887	10.72	46.95		0.21	0.94	0.13	0.59	0.45	1.99	11.51	50.41
* lb/hr based on 8,760 hr/yr.	**TOTAL:**	**1,772**	**9,870**		**17.97**	**78.72**	**TOTAL:**	**0.36**	**1.57**	**0.23**	**0.99**	**0.76**	**3.34**	**19.30**	**84.51**
					Pre-Control:			17.97	78.72	11.27	49.35	38.14	167.06	965	4,226

Source ID	Unit Description	Benzene 25.00 Gas lb/MMscf		Ethylbenzene 25.00 Gas lb/MMscf		n-Hexane 500.00 Gas lb/MMscf		Methanol 25.00 Gas lb/MMscf		Toluene 25.00 Gas lb/MMscf		2,2,4-TMP 25.00 Gas lb/MMscf		Xylene 25.00 Gas lb/MMscf		Total HAP 650.00 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
PIG (24E)	16" Pig Receiver A	2E-04	7E-04	2E-04	7E-04	3E-03	1E-02	2E-04	7E-04	2E-04	7E-04	2E-04	7E-04	2E-04	7E-04	4E-03	0.02
	16" Pig Receiver B	3E-05	1E-04	3E-05	1E-04	7E-04	3E-03	3E-05	1E-04	3E-05	1E-04	3E-05	1E-04	3E-05	1E-04	9E-04	4E-03
	16" Pig Receiver C	3E-05	1E-04	3E-05	1E-04	7E-04	3E-03	3E-05	1E-04	3E-05	1E-04	3E-05	1E-04	3E-05	1E-04	9E-04	4E-03
	16" Pig Launcher	3E-04	1E-03	3E-04	1E-03	0.01	0.03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	0.01	0.04
* lb/hr based on 8,760 hr/yr.	**TOTAL:**	**6E-04**	**2E-03**	**6E-04**	**2E-03**	**0.01**	**0.05**	**6E-04**	**2E-03**	**6E-04**	**2E-03**	**6E-04**	**2E-03**	**6E-04**	**2E-03**	**0.01**	**0.06**
	Pre-Control:	0.03	0.12	0.03	0.12	0.56	2.47	0.03	0.12	0.03	0.12	0.03	0.12	0.03	0.12	0.73	3.21

Notes: 1 - Pigging volumes are estimated as follows:

Description	Units	D (in)	L (ft)	Pa (psig)	Vacf	Gas (lb/ft3)	Total Mass of Flammable Gas (lbm)	Vscf*
16" Receiver (Each) (Low Pressure)	1	20	10.0	740	21.82	3.4720	75.747	1,442
	1	16	14.5	740	20.25	3.4720	70.293	1,338
	1	12	9.0	740	7.07	3.4720	24.542	467
	1	8	25.0	740	8.73	3.4720	30.299	577
							TOTAL:	**3,823**
16" Launcher (High Pressure)	1	20	10.0	1,440	21.82	7.5410	164.519	3,041
	1	16	14.5	1,440	20.25	7.5410	152.674	2,822
	1	12	9.0	1,440	7.07	7.5410	53.304	985
	1	8	25.0	1,440	8.73	7.5410	65.808	1,216
							TOTAL:	**8,064**

*Vscf = lbm gas * [379.482 scf/lb-mol] / [gas MW]

3 - Frequency of Pigging Events:

2	Pigging Events each day / Receiver A	=	**730 Events/yr**
3	Pigging Events each week / Receiver B	=	**156 Events/yr**
3	Pigging Events each week / Receiver C	=	**156 Events/yr**
2	Pigging Events each day / Launcher	=	**730 Events/yr**

2 - The results of a representative **Wet Gas Analysis** were used to determine the following worst-case components (See Appendix S1 - Wet Gas Summary):

	Min. Contingency:	10% VOC and GHG		
Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
CO2	110 lb/MMscf	**200 lb/MMscf**	0.341	1.254
Methane (CH4)	30,734 lb/MMscf	**33,850 lb/MMscf**	57.765	212.226
N2/Water/Ethane/Etc	13,209 lb/MMscf	**8,600 lb/MMscf**	14.676	53.918
VOC	14,481 lb/MMscf	**15,950 lb/MMscf**	27.218	100.000
TOTAL Gas	58,535 lb/MMscf	**58,600 lb/MMscf**	100.000	---

Pollutant	Wet Gas	Worst Case	%Total	%VOC
Benzene	5.35 lb/MMscf	**25 lb/MMscf**	0.043	0.157
Ethylbenzene	0.84 lb/MMscf	**25 lb/MMscf**	0.043	0.157
n-Hexane	395.58 lb/MMscf	**500 lb/MMscf**	0.853	3.135
Methanol (MeOH)	0.25 lb/MMscf	**25 lb/MMscf**	0.043	0.157
Toluene	9.47 lb/MMscf	**25 lb/MMscf**	0.043	0.157
2,2,4-TMP	6.62 lb/MMscf	**25 lb/MMscf**	0.043	0.157
Xylenes	15.67 lb/MMscf	**25 lb/MMscf**	0.043	0.157
Total HAP	433.79 lb/MMscf	**650 lb/MMscf**	1.109	4.075

DFT/DSV Thermal Oxidizer (TO-01 (11E))

Source ID	Description	Reference	Pollutant	Emission Factor		Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy
TO-01 (11E)	**Thermal Oxidizer (Combustion Only)** Controls Dehydrator (DHY 01/02) Flash Tanks (DFT-01/02) and Still Vents (DSV-01/02) Site Rating **10.00 MMBtu/hr (HHV)** **99.5% Control Efficiency** **755 Btu/scf (HHV)** 8,760 hr/yr 12,892 scf/hr 309 Mscf/dy 112.93 MMscf/yr	EPA AP-42 Table 1.4-1	NOX	73.98	9.80E-02	**0.98**	**4.29**
		EPA AP-42 Table 13.5-1	CO	233.92	3.10E-01	**3.10**	**13.58**
		EPA AP-42 Table 1.4-2	NMNEHC	4.01	5.32E-03	**0.05**	**0.23**
		EPA AP-42 Table 1.4-2	VOC	4.07	5.39E-03	**0.05**	**0.24**
		EPA AP-42 Table 1.4-2	SO2	0.44	5.88E-04	**0.01**	**0.03**
		EPA AP-42 Table 1.4-2	PM10/2.5	5.62	7.45E-03	**0.07**	**0.33**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	1.55E-03	2.06E-06	**2E-05**	**9E-05**
		EPA AP-42 Table 1.4-3	Butadiene, 1,3-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	0.06	7.35E-05	**7E-04**	**3E-03**
		EPA AP-42 Table 1.4-3	Hexane, n-	1.33	1.76E-03	**0.02**	**0.08**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	POM/PAH	5.17E-04	6.85E-07	**7E-06**	**3E-05**
		EPA AP-42 Table 1.4-3	Toluene	2.52E-03	3.33E-06	**3E-05**	**1E-04**
		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	8.88E-04	1.18E-06	**1E-05**	**5E-05**
		SUM	Total HAP	1.39	1.85E-03	**0.02**	**0.08**
		EPA AP-42 Table 1.4-2	CO2 (GWP=1)	88,774	117.65	**1,176**	**5,153**
		EPA AP-42 Table 1.4-2	CH4 (GWP=25)	1.70	2.25E-03	**0.02**	**0.10**
		40CFR98 - Table C-2	N2O (GWP=298)	0.17	2.20E-04	**2E-03**	**0.01**
		40CFR98 - Table A-1	CO2e	88,867	117.77	**1,178**	**5,158**

Notes:

1 - Dehydrator flash tank off-gases are generally burned as fuel in the reboiler. However, to be conservative, all flash tank off-gases are shown as being routed to the Thermal Oxidizer (TO-01 (11E))).

2 - Heat Input to the Thermal Oxidizer was determined as follows:

Waste/Pilot Gas Stream	scf/hr	Btu/scf (HHV)	MMBtu/hr
DFT-01/02 - Flash Tank Off-Gas	2,640	1,612	4.26
DSV-01/02 - Regenerator/Still Vent Gas	7,720	397.90	3.07
Purge, Fuel and Pilot Gas	850.00	1,331	1.13
15% Contingency	1,682	754.58	1.27
Total Gas to TO-01 (11E)	**12,892**	**754.58**	**9.73**
		Round-Up:	**10.00**

3 - Reference: GRI-GLYCalc Results, Worst-Case Gas Analysis, Vendor Data, and Engineering Judgment.

CBD/PIG/STAB Elevated Flare (FLR-01 (14E))

Source ID	Description	Reference	Pollutant	Emission Factor		Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy
FLR-01 (14E)	**Elevated Flare (Combustion Only)** Controls Compressor Blowdown (CBD (6E), Pigging Operations (PIG (24E)) and Stabilizer Overheads (STAB (25E)) Site Rating **8.00 MMBtu/hr (HHV) (Ave)** **98.0% Control Efficiency** **1,344 Btu/scf (HHV)** 8,760 hr/yr (intermittent) 5,730 scf/hr (Ave) 138 Mscf/dy 50.19 MMscf/yr	EPA AP-42 Table 1.4-1	NOX	131.72	9.80E-02	**0.78**	**3.44**
		EPA AP-42 Table 13.5-1	CO	416.49	3.10E-01	**2.48**	**10.86**
		EPA AP-42 Table 1.4-2	NMNEHC	7.15	5.32E-03	**0.04**	**0.19**
		EPA AP-42 Table 1.4-2	VOC	7.24	5.39E-03	**0.04**	**0.19**
		EPA AP-42 Table 1.4-2	SO2	0.79	5.88E-04	**5E-03**	**0.02**
		EPA AP-42 Table 1.4-2	PM10/2.5	10.01	7.45E-03	**0.06**	**0.26**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	2.77E-03	2.06E-06	**2E-05**	**7E-05**
		EPA AP-42 Table 1.4-3	Butadiene, 1,3-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	0.10	7.35E-05	**6E-04**	**3E-03**
		EPA AP-42 Table 1.4-3	n-Hexane	2.37	1.76E-03	**0.01**	**0.06**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	POM/PAH	9.2E-04	6.85E-07	**5E-06**	**2E-05**
		EPA AP-42 Table 1.4-3	Toluene	4.5E-03	3.33E-06	**3E-05**	**1E-04**
		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	1.6E-03	1.18E-06	**9E-06**	**4E-05**
		SUM	Total HAP	2.48	1.85E-03	**0.01**	**0.06**
		EPA AP-42 Table 1.4-2	CO2 (GWP=1)	158,062	117.65	**941.18**	**4,122**
		EPA AP-42 Table 1.4-2	CH4 (GWP=25)	3.03	2.25E-03	**0.02**	**0.08**
		40CFR98 - Table C-2	N2O (GWP=298)	0.30	2.20E-04	**2E-03**	**0.01**
		40CFR98 - Table A-1	CO2e	158,226	117.77	**942.15**	**4,127**

Notes:

1 - The average Heat Input to FLR-01 (14E) was determined as follows:

Waste/Pilot Gas Stream	scf/hr (ave)	Btu/scf (HHV)	MMBtu/hr (ave)
Compresssor Blowdown (CBD)	2,710	1,331	3.61
Pigging Operations (PIG)	1,127	1,331	1.50
Condensate Stabilizer Overheads (STAB)	78.44	2,276	0.18
Purge, Fuel, and Pilot Gas	860.00	1,331	1.14
-100% Contingency	955	1,331	1.27
Total Gas to FLR-01 (14E)	**5,730**	**1,344**	**7.70**
		Round-Up:	**8.00**

Note: Avg hourly rate based on 5 days of overheads to flare prorated over one (1) year.

2 - Reference: Worst-Case Wet Gas Analysis, Vendor Data, and Engineering Judgment.

3 - FLR-01 (14E) controls compressor blowdown (CBD), emergency shutdown (ESD), pigging operations (PIG) and stabilizer overheads (STAB).

Process Piping and Equipment Leaks – Gas (FUG-G (1F))

Source ID	Description	Component (Unit) Type (Gas)	Unit Count	Leak Factor	Pre-Controlled Leaks		LDAR Control Credit	Controlled Leaks		VOC 27.22 Wgt%		CO2 1.25% VOC		CH4 212% VOC		CO2e CH4 GWP = 25	
				lb/hr/Unit	lb/hr	tpy		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FUG-G (1F)	Process Piping and Equipment Leaks (Gas)	Valves	960	9.92E-03	9.52	41.71	92%	0.76	3.34	0.21	0.91	1E-04	4E-04	0.02	0.07	0.40	1.77
		Pump Seals	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Other	72	1.94E-02	1.40	6.12	---	1.40	6.12	0.38	1.67	2E-04	8E-04	0.03	0.13	0.74	3.25
		Connectors	3,132	4.41E-04	1.38	6.05	93%	0.10	0.42	0.03	0.12	1E-05	5E-05	2E-03	0.01	0.05	0.22
		Flanges	783	8.60E-04	0.67	2.95	---	0.67	2.95	0.18	0.80	8E-05	4E-04	0.01	0.06	0.36	1.56
		Open-ended Lines	34	4.41E-03	0.15	0.66	---	0.15	0.66	0.04	0.18	2E-05	8E-05	3E-03	0.01	0.08	0.35
		TOTAL:	**4,981**						**TOTAL:**	**0.84**	**3.67**	**4E-04**	**2E-03**	**0.07**	**0.29**	**1.63**	**7.16**
									PRE Control:	3.57	15.65	2E-03	0.01	0.28	1.22	6.97	30.51

Source ID	Description	Component (Unit) Type (Gas)	Benzene 0.157% VOC		Ethylbenzene 0.157% VOC		Hexane, n- (C6) 3.13% VOC		Methanol 0.16% VOC		Toluene (C7) 0.157% VOC		TMP, 2,2,4- 0.157% VOC		Xylenes (C8) 0.157% VOC		Total HAP 4.075% VOC	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FUG-G (1F)	Process Piping and Equipment Leaks (Gas)	Valves	3E-04	1E-03	3E-04	1E-03	0.01	0.03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	0.01	0.04
		Pump Seals	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Other	6E-04	3E-03	6E-04	3E-03	0.01	0.05	6E-04	3E-03	6E-04	3E-03	6E-04	3E-03	6E-04	3E-03	0.02	0.07
		Connectors	4E-05	2E-04	4E-05	2E-04	8E-04	0.00	4E-05	2E-04	4E-05	2E-04	4E-05	2E-04	4E-05	2E-04	1E-03	0.00
		Flanges	3E-04	1E-03	3E-04	1E-03	0.01	0.03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	3E-04	1E-03	0.01	0.03
		Open-ended Lines	6E-05	3E-04	6E-05	3E-04	1E-03	0.01	6E-05	3E-04	6E-05	3E-04	6E-05	3E-04	6E-05	3E-04	2E-03	0.01
		TOTAL:	**1E-03**	**6E-03**	**1E-03**	**6E-03**	**0.03**	**0.12**	**1E-03**	**6E-03**	**1E-03**	**6E-03**	**1E-03**	**6E-03**	**1E-03**	**0.01**	**0.03**	**0.15**
		PRE Control:	6E-03	0.02	6E-03	0.02	0.11	0.49	6E-03	0.02	6E-03	0.02	6E-03	0.02	0.01	0.02	0.15	0.64

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		Light Oil		Water/Oil	
	kg/hr	lb/hr/unit	kg/hr	lb/hr/unit	kg/hr	lb/hr/unit
Valves	4.5E-03	9.92E-03	2.5E-03	5.51E-03	9.8E-05	2.16E-04
Pump Seals	---	---	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 - The results of a representative **Inlet Gas Analysis** were used to determine the following worst-case components (See Attachment S4 - Lab Analysis):

	Min. Contingency:	10% VOC		
Pollutant	**Wet Gas**	**Worst Case**	**%Total**	**%VOC**
CO2	110.29 lb/MMscf	200.00 lb/MMscf	0.341	**1.254**
Methane (CH4)	30,734 lb/MMscf	33,850 lb/MMscf	57.765	**212.226**
N2/Water/Ethane/Etc	13,209 lb/MMscf	8,600 lb/MMscf	14.676	**53.918**
VOC	14,481 lb/MMscf	15,950 lb/MMscf	27.218	**100.000**
TOTAL Gas	58,535 lb/MMscf	58,600 lb/MMscf	100.000	**---**
Benzene	5.35 lb/MMscf	25.00 lb/MMscf	0.043	**0.157**
Ethylbenzene	0.84 lb/MMscf	25.00 lb/MMscf	0.043	**0.157**
Hexane, n-	395.58 lb/MMscf	500.00 lb/MMscf	0.853	**3.135**
Methanol (MeOH)	0.25 lb/MMscf	25.00 lb/MMscf	0.043	**0.157**
Toluene	9.47 lb/MMscf	25.00 lb/MMscf	0.043	**0.157**
TMP, 2,2,4-	6.62 lb/MMscf	25.00 lb/MMscf	0.043	**0.157**
Xylenes	15.67 lb/MMscf	25.00 lb/MMscf	0.043	**0.157**
Total HAP	433.79 lb/MMscf	650.00 lb/MMscf	1.109	**4.075**

Process Piping and Equipment Leaks – Light Oil (FUG-L (2F))

Source ID	Description	Component (Unit) Type (Light Oil)	Unit Count	Leak Factor	Pre-Controlled Leaks		LDAR Control Credit	Controlled Leaks		VOC 100.00 Wgt%		CO2 --- VOC		CH4 --- VOC		CO2e CH4 GWP = 25	
				lb/hr/Unit	lb/hr	tpy		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FUG-L (2F)	Process Piping and Equipment Leaks (Light Oil)	Valves	576	5.51E-03	3.17	13.90	88%	0.38	1.67	0.38	1.67	---	---	---	---	---	---
		Pump Seals	12	2.87E-02	0.34	1.51	75%	0.09	0.38	0.09	0.38	---	---	---	---	---	---
		Other	43	1.65E-02	0.71	3.11	---	0.71	3.11	0.71	3.11	---	---	---	---	---	---
		Connectors	1,296	4.63E-04	0.60	2.63	93%	0.04	0.18	0.04	0.18	---	---	---	---	---	---
		Flanges	324	2.43E-04	0.08	0.34	---	0.08	0.34	0.08	0.34	---	---	---	---	---	---
		Open-ended Lines	20	3.09E-03	0.06	0.27	---	0.06	0.27	0.06	0.27	---	---	---	---	---	---
		TOTAL:	**2,271**						**TOTAL:**	**1.36**	**5.96**	**---**	**---**	**---**	**---**	**---**	**---**
									PRE Control:	4.97	21.77	---	---	---	---	---	---

Source ID	Description	Component (Unit) Type (Light Oil)	Benzene 0.09% VOC		Ethylbenzene 2.28% VOC		Hexane, n- (C6) 8.42% VOC		Methanol 0.088% VOC		Toluene (C7) 1.15% VOC		TMP, 2,2,4- 0.77% VOC		Xylenes (C8) 2.98% VOC		Total HAP 15.78% VOC	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FUG-L (2F)	Process Piping and Equipment Leaks (Light Oil)	Valves	3E-04	1E-03	0.01	0.04	0.03	0.14	3E-04	1E-03	4E-03	0.02	3E-03	0.01	0.01	0.05	0.06	0.26
		Pump Seals	8E-05	3E-04	2E-03	0.01	0.01	0.03	8E-05	3E-04	1E-03	4E-03	7E-04	3E-03	3E-03	0.01	0.01	0.06
		Other	6E-04	3E-03	0.02	0.07	0.06	0.26	6E-04	3E-03	0.01	0.04	0.01	0.02	0.02	0.09	0.11	0.49
		Connectors	4E-05	2E-04	1E-03	4E-03	4E-03	0.02	4E-05	2E-04	5E-04	2E-03	3E-04	1E-03	1E-03	0.01	0.01	0.03
		Flanges	7E-05	3E-04	2E-03	0.01	0.01	0.03	7E-05	3E-04	9E-04	4E-03	6E-04	3E-03	2E-03	0.01	0.01	0.05
		Open-ended Lines	5E-05	2E-04	1E-03	0.01	0.01	0.02	5E-05	2E-04	7E-04	3E-03	5E-04	2E-03	2E-03	0.01	0.01	0.04
		TOTAL:	**1E-03**	**0.01**	**0.03**	**0.14**	**0.11**	**0.50**	**1E-03**	**5E-03**	**0.02**	**0.07**	**0.01**	**0.05**	**0.04**	**0.18**	**0.21**	**0.94**
		PRE Control:	4E-03	0.02	0.11	0.50	0.42	1.83	4E-03	2E-02	0.06	0.25	0.04	0.17	0.15	0.65	0.78	3.43

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

2 - Light Oil 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		Light Oil		Water/Oil	
	kg/hr	lb/hr/unit	kg/hr	lb/hr/unit	kg/hr	lb/hr/unit
Valves	4.5E-03	9.92E-03	**2.5E-03**	**5.51E-03**	9.8E-05	2.16E-04
Pump Seals	---	---	**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 - The results of a representative **Condensate Analysis** were used to determine the following worst-case components (See Attachment S4 - Lab Analysis):

	Min. Contingency:	10% VOC 100% HAP		
Pollutant	**Condensate**	**Worst Case**	**%Total**	**%VOC**
CO2	--- lb/MMscf	--- lb/MMscf	---	**---**
Methane (CH4)	--- lb/MMscf	--- lb/MMscf	---	**---**
N2/Water/Ethane/Etc	--- lb/MMscf	--- lb/MMscf	---	**---**
VOC	268,162 lb/MMscf	295,000 lb/MMscf	100.00	**100.00**
TOTAL Condenate	268,162 lb/MMscf	295,000 lb/MMscf	100.00	**---**
Benzene	126.59 lb/MMscf	260.00 lb/MMscf	0.09	**0.09**
Ethylbenzene	3,357 lb/MMscf	6,720 lb/MMscf	2.28	**2.28**
Hexane, n-	12,422 lb/MMscf	24,850 lb/MMscf	8.42	**8.42**
Methanol (MeOH)	--- lb/MMscf	260.00 lb/MMscf	9E-02	**0.088**
Toluene	1,687 lb/MMscf	3,380 lb/MMscf	1.15	**1.15**
TMP, 2,2,4-	1,132 lb/MMscf	2,270 lb/MMscf	0.77	**0.77**
Xylenes	4,395 lb/MMscf	8,800 lb/MMscf	2.98	**2.98**
Total HAP	23,120 lb/MMscf	46,540 lb/MMscf	15.78	**15.78**

Engine Crankcase (ECC (3F))

Unit ID	Source ID	Site Rating	Operations	CAT G3616 A4 Emission Rates
				0.42 scf/bhp-hr
				MMscf/yr
ECC (3F)	CE-01	5,350 bhp	8,760 hr/yr	19.65
	CE-02	5,350 bhp	8,760 hr/yr	19.65
	CE-03	5,350 bhp	8,760 hr/yr	19.65
	CE-04	5,350 bhp	8,760 hr/yr	19.65
	TOTAL:	**21,400 bhp**	**35,040 hr/yr**	**78.59**

	NOx		CO		VOC		SO2		PM	
	4.72 lb/hr		31.02 lb/hr		13.15 lb/hr		0.02 lb/hr		0.39 lb/hr	
	5.86 lb/MMscf		38.51 lb/MMscf		16.32 lb/MMscf		0.03 lb/MMscf		0.49 lb/MMscf	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-01	0.01	0.06	0.09	0.38	0.04	0.16	6E-05	3E-04	1E-03	5E-03
CE-02	0.01	0.06	0.09	0.38	0.04	0.16	6E-05	3E-04	1E-03	5E-03
CE-03	0.01	0.06	0.09	0.38	0.04	0.16	6E-05	3E-04	1E-03	5E-03
CE-04	0.01	0.06	0.09	0.38	0.04	0.16	6E-05	3E-04	1E-03	5E-03
Total:	**0.05**	**0.23**	**0.35**	**1.51**	**0.15**	**0.64**	**3E-04**	**1E-03**	**4E-03**	**0.02**
Pre-Control:	0.05	0.23	0.35	1.51	0.15	0.64	3E-04	1E-03	4E-03	0.02

	CO2		CH4		N2O		CO2e	
	5,319 lb/hr		18.64 lb/hr		0.01 lb/hr		5,788 lb/hr	
	6,604 lb/MMscf		23.14 lb/MMscf		0.01 lb/MMscf		7,185 lb/MMscf	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-01	14.81	64.88	0.05	0.23	2E-05	1E-04	16.12	70.59
CE-02	14.81	64.88	0.05	0.23	2E-05	1E-04	16.12	70.59
CE-03	14.81	64.88	0.05	0.23	2E-05	1E-04	16.12	70.59
CE-04	14.81	64.88	0.05	0.23	2E-05	1E-04	16.12	70.59
Total:	**59.25**	**259.50**	**0.21**	**0.91**	**1E-04**	**4E-04**	**64.46**	**282.35**
Pre-:	59.25	259.50	0.21	0.91	1E-04	4E-04	64.46	282.35

Source ID	Acetaldehyde		Acrolein		Benzene		Butadiene		Ethylbenzene		HCHO		Hexane, n-		Methanol		POM/PAH		Toluene		TMP, 2,2,4-		Xylenes		Other/Trace		Total HAPs	
	0.33 lb/hr		0.20 lb/hr		0.02 lb/hr		0.01 lb/hr		2E-03 lb/hr		2.36 lb/hr		0.04 lb/hr		0.10 lb/hr		0.01 lb/hr		0.02 lb/hr		0.01 lb/hr		0.01 lb/hr		0.01 lb/hr		3.12 lb/hr	
	0.41 lb/MMscf		0.25 lb/MMscf		0.02 lb/MMscf		0.01 lb/MMscf		2E-03 lb/MMscf		2.93 lb/MMscf		0.05 lb/MMscf		0.12 lb/MMscf		0.02 lb/MMscf		0.02 lb/MMscf		0.01 lb/MMscf		0.01 lb/MMscf		0.02 lb/MMscf		3.87 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-01	9E-04	4E-03	6E-04	2E-03	5E-05	2E-04	3E-05	1E-04	4E-06	2E-05	0.01	0.03	1E-04	5E-04	3E-04	1E-03	4E-05	2E-04	4E-05	2E-04	3E-05	1E-04	2E-05	9E-05	3E-05	2E-04	0.01	0.04
CE-02	9E-04	4E-03	6E-04	2E-03	5E-05	2E-04	3E-05	1E-04	4E-06	2E-05	0.01	0.03	1E-04	5E-04	3E-04	1E-03	4E-05	2E-04	4E-05	2E-04	3E-05	1E-04	2E-05	9E-05	3E-05	2E-04	0.01	0.04
CE-03	9E-04	4E-03	6E-04	2E-03	5E-05	2E-04	3E-05	1E-04	4E-06	2E-05	0.01	0.03	1E-04	5E-04	3E-04	1E-03	4E-05	2E-04	4E-05	2E-04	3E-05	1E-04	2E-05	9E-05	3E-05	2E-04	0.01	0.04
CE-04	9E-04	4E-03	6E-04	2E-03	5E-05	2E-04	3E-05	1E-04	4E-06	2E-05	0.01	0.03	1E-04	5E-04	3E-04	1E-03	4E-05	2E-04	4E-05	2E-04	3E-05	1E-04	2E-05	9E-05	3E-05	2E-04	0.01	0.04
Total	**4E-03**	**0.02**	**2E-03**	**0.01**	**2E-04**	**8E-04**	**1E-04**	**5E-04**	**2E-05**	**8E-05**	**0.03**	**0.12**	**5E-04**	**2E-03**	**1E-03**	**5E-03**	**2E-04**	**7E-04**	**2E-04**	**8E-04**	**1E-04**	**5E-04**	**8E-05**	**4E-04**	**1E-04**	**6E-04**	**0.03**	**0.15**
Pre-Control:	4E-03	0.02	2E-03	0.01	2E-04	8E-04	1E-04	5E-04	2E-05	8E-05	0.03	0.12	5E-04	2E-03	1E-03	5E-03	2E-04	7E-04	2E-04	8E-04	1E-04	5E-04	8E-05	4E-04	1E-04	6E-04	0.03	0.15

Notes: 1 - As per Caterpillar's Application & Installation Guide - Crankcase Ventilation Systems:
"[B]low-by on a new engine is approx. 0.5 ft3 (acf)/bhp-hr
and design for a worn engine should be 1.0 ft3 (acf)/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 (@ 799 oF vs. 68 oF (Ignore Δ psi):	1.0 acf/bhp-hr =	0.42 scf/bhp-hr

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 (@ 799 oF vs. 68 oF (Ignore Δ psi):	32,023 acfm =	13,425 scfm

Potentially Applicable

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 lb/MMBtu	4SLB lb/MMBtu	4SRB lb/MMBtu	Uncontrolled lb/MMBtu	Lean Pre-Mix# lb/MMBtu
CRITERIA	NOx (≥ 90% Load)	3.17E+00	4.08E+00	2.21E+00	3.23E-01	9.91E-02
	CO (≥ 90% Load)	3.86E-01	3.17E-01	3.72E+00	8.23E-02	1.51E-02
	VOC (NMNEHC w/o Aldehydes*)	4.93E-02	5.17E-02	3.68E-03	2.06E-03	2.06E-03
	VOC (NMNEHC w/ Aldehydes*)	1.20E-01	1.18E-01	2.96E-02	2.82E-03	2.13E-03
	SO2 (2,000 gr-S/MMscf ≈ 0.0007 W%)	5.88E-04	5.88E-04	5.88E-04	3.20E-03	3.20E-03
	PM10/2.5 (Condensible and Filterable)	4.83E-02	9.99E-03	1.94E-02	6.63E-03	6.63E-03
HAPs	Acetaldehyde*	7.76E-03	8.36E-03	2.79E-03	4.00E-05	4.00E-05
	Acrolein*	7.78E-03	5.14E-03	2.63E-03	6.40E-06	6.40E-06
	Benzene	1.94E-03	4.40E-04	1.58E-03	1.20E-05	9.10E-07
	Butadiene, 1,3-	8.20E-04	2.67E-04	6.63E-04	4.30E-07	4.30E-07
	Ethylbenzene	1.08E-04	3.97E-05	2.48E-05	3.20E-05	3.20E-05
	Formaldehyde (HCHO)*	5.52E-02	5.28E-02	2.05E-02	7.10E-04	2.00E-05
	Hexane, n-	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- (TMP) (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	Use 40CFR98	Use 40CFR98

(#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			13.5-1 06/17	3.3-1; 3.3-2 10/96
		Uncontrolled lb/MMBtu	LoNOx Burners lb/MMBtu	Flue Gas Recirc lb/MMBtu	Combustion lb/MMBtu	Uncontrolled lb/MMBtu
CRITERIA	NOx (≥ 90% Load)	9.80E-02	4.90E-02	3.14E-02	Use Ext. Comb.	4.41E+00
	CO (≥ 90% Load)	8.24E-02	8.24E-02	8.24E-02	3.10E-01	9.50E-01
	VOC (NMNEHC w/o Aldehydes*)	5.32E-03	5.32E-03	5.32E-03		3.60E-01
	VOC (NMNEHC w/ Aldehydes*)	5.39E-03	5.39E-03	5.39E-03	Use Ext. Comb.	3.62E-01
	SO2 (2,000 gr-S/MMscf ≈ 0.0007 W%)	5.88E-04	5.88E-04	5.88E-04		2.90E-01
	PM10/2.5 (Condensible and Filterable)	7.45E-03	7.45E-03	7.45E-03		3.10E-01
HAPs	Acetaldehyde*	---	---	---		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
	Hexane, n-	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					
Fuel Type	Table C-1 to Subpart C of Part 98		Table C-2 to Subpart C of Part 98		Weighted Sum
	Default HHV	Carbon Dioxide lb CO2/MMBtu	Methane lb CH4/MMBtu	Nitrous Oxide lb N2O/MMBtu	CO2e lb CO2e/MMBtu
Fuel Oil No. 2 (Diesel)	138,000 Btu/gal	1.63E+02	6.61E-03	1.32E-03	1.64E+02
Propane	91,000 Btu/gal	1.39E+02	6.61E-03	1.32E-03	1.39E+02
Natural Gas	1,026 Btu/scf	1.17E+02	2.20E-03	2.20E-04	1.17E+02

* Aldehyde (not measured in EPA Test Method 25)

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

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

Supplement S4

Lab Analysis

- **Inlet Gas – Summary**
- **Inlet Gas – Lab Analysis**
- **Stabilizer Overheads – Summary**
- **Stabilized Condensate – Summary**
- **Stabilized Condensate – Lab Analysis**
- **Btu Load – Thermal Oxidizer (TO-01 (11E))**
- **Btu Load – Elevated Flare (FLR-01 (14E))**

Inlet Gas - Summary

Sampled: 10/28/19

GPSA-Sec 23

Component	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Wgt Sum (MW*Mol Fraction)	lb/MMscf (WS/UGC#)	Weight % Total	Weight % THC	Weight % VOC	Component Btu/scf (HHV)	Btu/scf (HHV)
Water	109-86-4	H2O	18.015	---	---	---	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	**0.0951**	0.0419	110.29	0.1884	---	---	---	---
Nitrogen	7727-37-9	N2	28.013	**0.5095**	0.1427	376.11	0.6425	---	---	---	---
Methane*	75-82-8	CH4	16.042	**72.7016**	11.6631	30,734.27	52.5058	52.9458	---	1,010.0	734.286
Ethane*	74-84-0	C2H6	30.069	**16.1959**	4.8699	12,833.13	21.9239	22.1076	---	1,769.7	286.619
Propane**	74-98-6	C3H8	44.096	**6.5622**	2.8936	7,625.23	13.0268	13.1359	52.6561	2,516.2	165.118
iso-Butane**	75-28-5	i-C4H10	58.122	**0.6514**	0.3786	997.69	1.7044	1.7187	6.8896	3,252.0	21.184
n-Butane**	106-97-8	n-C4H10	58.122	**1.8900**	1.0985	2,894.75	4.9453	4.9868	19.9898	3,262.4	61.659
iso-Pentane**	78-78-4	i-C5H12	72.149	**0.3456**	0.2493	657.07	1.1225	1.1319	4.5374	4,000.9	13.827
n-Pentane**	109-66-0	n-C5H12	72.149	**0.5068**	0.3656	963.55	1.6461	1.6599	6.6538	4,008.9	20.317
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---	---	3,763.6	---
Cyclohexane**	110-82-7	C6H12	84.162	**0.0174**	0.0146	38.59	0.0659	0.0665	0.2665	4,481.6	0.780
Other Hexanes**	Various	C6H14	86.175	**0.1602**	0.1381	363.79	0.6215	0.6267	2.5122	4,750.3	7.610
Heptanes**	142-82-5	C7H16	100.205	**0.1090**	0.1092	287.82	0.4917	0.4958	1.9876	5,502.5	5.998
Methylcyclohexane**	108-87-2	C7H14	98.186	**0.0215**	0.0211	55.63	0.0950	0.0958	0.3841	5,215.9	1.121
C8+ Heavies**	Various	C8+	138.00 est.	**0.0449**	0.0620	163.28	0.2789	0.2813	1.1275	7,000.0	3.143
Benzene***	71-43-2	C6H6	78.112	**0.0026**	0.0020	5.35	0.0091	0.0092	0.0370	3,741.9	0.097
Ethylbenzene***	100-41-4	C8H10	106.165	**0.0003**	0.0003	0.84	0.0014	0.0014	0.0058	5,222.0	0.016
Hexane, n-***	110-54-3	C6H14	86.175	**0.1742**	0.1501	395.58	0.6758	0.6815	2.7317	4,756.0	8.285
Methanol (MeOH)	67-56-1	CH4O	32.042	**0.0003**	1E-04	0.25	0.0004	0.0004	0.0017	866.90	0.003
Toluene***	108-88-3	C7H8	92.138	**0.0039**	0.0036	9.47	0.0162	0.0163	0.0654	4,474.9	0.175
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	**0.0022**	0.0025	6.62	0.0113	0.0114	0.0457	6,213.6	0.137
Xylenes***	1330-20-7	C8H10	106.165	**0.0056**	0.0059	15.67	0.0268	0.0270	0.1082	5,208.7	0.292
Totals:			**22.21**	**100.00**	**22.21**	**58,535**	**100.00**	---	---	**Calculated Btu/scf (HHV):**	**1,331**
THC:			**22.16**	**99.40**	**22.03**	**58,049**	**99.17**	**100.00**	---		
Total VOC:			**52.35**	**10.50**	**5.50**	**14,481**	**24.74**	**24.95**	**100.00**	**Worst-Case Btu/scf (HHV):**	**1,020**
Total HAP:			**87.05**	**0.19**	**0.16**	**434**	**0.74**	**0.75**	**3.00**		

#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			Assumed "Worst-Case" 110% VOC and GHG		Margin for Changes in Future Condensate Composition
	Mole %	Wgt %	lb/MMscf	Wgt %	lb/MMscf	
CO2	0.10	0.19	110.29	0.34	200.00	81% Margin
Methane*	72.70	52.51	30,734	57.76	33,850	10% Margin
Other (N2, C2, O2, CO, H2O)	16.71	22.57	13,209	14.68	8,600	--- Margin
VOC**	10.50	24.74	14,481	27.22	15,950	10% Margin
Total Gas	**100.00**	**100.00**	**58,535**	**100.00**	**58,600**	--- Margin
Benzene***	0.0026	0.0091	5.35	0.02	25.00	367% Margin
Ethylbenzene***	0.0003	0.0014	0.84	0.04	25.00	2879% Margin
Hexane, n-***	0.1742	0.6758	395.58	0.85	500.00	26% Margin
Methanol (MeOH)	0.0003	0.0004	0.25	0.04	25.00	9769% Margin
Toluene***	0.0039	0.0162	9.47	0.04	25.00	164% Margin
2,2,4-Trimethylpentane***	0.0022	0.0113	6.62	0.04	25.00	278% Margin
Xylenes***	0.0056	0.0268	15.67	0.04	25.00	60% Margin
Total HAP***	**0.19**	**0.74**	**433.79**	**1.08**	**650.00**	50% Margin

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

Inlet Gas - Lab Analysis

Ohio River Supply Hub
Quality Control Facility
61 Solvay Drive
Moundsville, WV 26041

Sample Information

Sample ID	191031-014
Sample Name	Pioneer Annual Dehy
Meter #	25083A
Sample Date & Time	10/28/2019 15:30
Sampling Method	S
Field Remarks	None
Lab Remarks	None
Sampled By	ME
Pressure (psi)	1100.0
Temperature (deg F)	100.0
Cylinder #	7597
H2S, ppm	
H2S, mol%	
Analyzed By	Adam Stimmell
Reported By	Adam Stimmell
Date Received	10/31/2019 16:03
Report Date	11/05/2019 14:55

Component Results

Component Name	Method	Mole %	Weight %	Vol %
NITROGEN	GPA 2286	0.5095	0.6428	0.2819
METHANE	GPA 2286	72.7016	52.5275	61.9770
CARBON DIOXIDE	GPA 2286	0.0951	0.1885	0.0816
ETHANE	GPA 2286	16.1959	21.9328	21.7803
PROPANE	GPA 2286	6.5622	13.0321	9.0910
i-BUTANE	GPA 2286	0.6514	1.7052	1.0719
n-BUTANE	GPA 2286	1.8900	4.9473	2.9962
neo-PENTANE	GPA 2286	0.0079	0.0257	0.0153
i-PENTANE	GPA 2286	0.3377	1.0974	0.6211
n-PENTANE	GPA 2286	0.5068	1.6467	0.9237
HEXANES PLUS	GPA 2286	0.5419	2.2541	1.1601
Total:		**100.000**	**100.000**	**100.000**

Stabilizer Overheads - Summary

Sampled: **From Pioneer CF Process Simulation** GPSA-Sec 23

Component	CAS	Formula	Molecular Weight (MW)	Mole % (M% = V%)	Wgt Sum (MW*Mol Fraction)	lb/MMscf (WS/UGC#)	Weight % Total	Weight % THC	Weight % VOC	Component Btu/scf (HHV)	Btu/scf (HHV)
Water	109-86-4	H2O	18.015	**0.1777**	0.032	84.36	0.0805	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	**0.0761**	0.033	88.25	0.0842	---	---	---	---
Nitrogen	7727-37-9	N2	28.013	**0.0298**	0.008	22.00	0.0210	---	---	---	---
Methane*	75-82-8	CH4	16.042	**17.7310**	2.844	7,495.68	7.1537	7.1670	---	1,010	179.083
Ethane*	74-84-0	C2H6	30.069	**26.5614**	7.987	21,046.39	20.0862	20.1236	---	1,770	470.057
Propane**	74-98-6	C3H8	44.096	**35.1000**	15.478	40,785.86	38.9252	38.9976	53.6350	2,516	883.186
iso-Butane**	75-28-5	i-C4H10	58.122	**3.0724**	1.786	4,705.73	4.4911	4.4994	6.1882	3,252	99.914
n-Butane**	106-97-8	n-C4H10	58.122	**10.1604**	5.905	15,561.80	14.8519	14.8795	20.4644	3,262	331.473
iso-Pentane**	78-78-4	i-C5H12	72.149	**1.7140**	1.237	3,258.72	3.1101	3.1158	4.2853	4,001	68.575
n-Pentane**	109-66-0	n-C5H12	72.149	**2.8255**	2.039	5,371.94	5.1269	5.1364	7.0643	4,009	113.271
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---	---	3,764	---
Cyclohexane**	110-82-7	C6H12	84.162	**0.0951**	0.193	210.91	0.2013	0.2017	0.2774	4,482	4.262
Other Hexanes**	Various	C6H14	86.175	**1.0480**	2.090	2,379.86	2.2713	2.2755	3.1296	4,750	49.783
Heptanes**	142-82-5	C7H16	100.205	**0.5417**	1.420	1,430.39	1.3651	1.3677	1.8810	5,503	29.807
Methylcyclohexane**	108-87-2	C7H14	98.186	**0.1125**	0.289	291.08	0.2778	0.2783	0.3828	5,216	5.868
C8+ Heavies**	Various	C8+	138.00 est.	**0.2285**	0.748	830.95	0.7930	0.7945	1.0927	7,000	15.995
Benzene***	71-43-2	C6H6	78.112	**0.0053**	0.004	10.91	0.0104	0.0104	0.0143	3,742	0.198
Ethylbenzene***	100-41-4	C8H10	106.165	**0.0100**	0.011	27.98	0.0267	0.0267	0.0368	5,222	0.522
n-Hexane***	110-54-3	C6H14	86.175	**0.4705**	0.405	1,068.44	1.0197	1.0216	1.4050	4,756	22.377
Methanol***	67-56-1	CH4O	32.042	**0.0001**	3E-05	0.08	0.0001	0.0001	0.0001	866.90	0.001
Toluene***	108-88-3	C7H8	92.138	**0.0177**	0.016	42.98	0.0410	0.0411	0.0565	4,475	0.792
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	**0.0107**	0.012	32.21	0.0307	0.0308	0.0424	6,214	0.665
Xylenes***	1330-20-7	C8H10	106.165	**0.0120**	0.013	33.57	0.0320	0.0321	0.0441	5,209	0.625
			Totals:	**100.00**	**42.55**	**104,780**	**100.00**	---	---	**Calculated Btu/scf (HHV):**	**2,276**
			THC:	**99.72**	**42.48**	**104,585**	**99.81**	**100.00**	---		
			Total VOC:	**55.42**	**31.65**	**76,043**	**72.57**	**72.71**	**100.00**		
			Total HAP:	**0.53**	**0.46**	**1,216**	**1.16**	**1.16**	**1.60**		

#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			Assumed "Worst-Case" 120% VOC and GHG		Margin for Changes in Future Gas Composition
	Mole %	Wgt %	lb/MMscf	Wgt %	lb/MMscf	
CO2	0.08	0.08	88.25	0.09	105.91	20% Margin
Methane*	17.73	7.15	7,496	**7.40**	**8,995**	20% Margin
Other (N2, C2, O2, CO, H2O)	26.77	20.19	21,153	17.41	21,153	0% Margin
VOC**	55.42	72.57	76,043	**75.10**	**91,252**	20% Margin
Total Gas	**100.00**	**100.00**	**104,780**	100.00	**121,506**	16% Margin
Benzene***	0.0053	0.01	10.91	**0.01**	**13.09**	20% Margin
Ethylbenzene***	0.0100	0.03	27.98	**0.03**	**33.57**	20% Margin
n-Hexane***	0.4705	1.02	1,068	**1.06**	**1,282**	20% Margin
Methanol***	0.0001	8E-05	0.08	**8E-05**	**0.10**	20% Margin
Toluene***	0.0177	0.04	42.98	**0.04**	**51.57**	20% Margin
2,2,4-Trimethylpentane***	0.0107	0.03	32.21	**0.03**	**38.65**	20% Margin
Xylenes***	0.0120	0.03	33.57	**0.03**	**40.29**	20% Margin
Total HAP***	**0.5263**	**1.16**	**1,216**	**1.20**	**1,459**	20% Margin

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

Stabilized Condensate - Summary

Sampled: **From Pioneer CF 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	---	---	---	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.010	---	---	---	---	---	---	---	---
Hydrogen Sulfide	2148-87-8	H2S	34.086	---	---	---	---	---	---	637.6	---
Nitrogen	7727-37-9	N2	28.013	---	---	---	---	---	---	---	---
Methane*	75-82-8	CH4	16.042	---	---	---	---	---	---	1,010.0	---
Ethane*	74-84-0	C2H6	30.069	**0.0001**	0.00002	0.05	**0.00002**	0.00002	---	1,769.7	0.001
Propane**	74-98-6	C3H8	44.096	**1.1300**	0.498	1,313.05	**0.4896**	0.4896	0.4896	2,516.2	28.433
iso-Butane**	75-28-5	i-C4H10	58.122	**1.7000**	0.988	2,603.75	**0.9710**	0.9710	0.9710	3,252.0	55.284
n-Butane**	106-97-8	n-C4H10	58.122	**9.2900**	5.400	14,228.74	**5.3060**	5.3060	5.3060	3,262.4	303.077
iso-Pentane**	78-78-4	i-C5H12	72.149	**4.3300**	3.124	8,232.39	**3.0699**	3.0699	3.0699	4,000.9	173.239
n-Pentane**	109-66-0	n-C5H12	72.149	**9.4400**	6.811	17,947.74	**6.6929**	6.6929	6.6929	4,008.9	378.440
Cyclopentane**	287-92-3	C5H10	70.100	---	---	---	---	---	---	3,763.6	---
Cyclohexane**	110-82-7	C6H12	84.162	**1.2750**	1.073	2,827.71	**1.0545**	1.0545	1.0545	4,481.6	57.140
Other Hexanes**	Various	C6H14	86.175	**8.6600**	7.463	19,665.72	**7.3335**	7.3335	7.3335	4,750.3	411.376
Heptanes**	142-82-5	C7H16	100.205	**16.7567**	16.791	44,247.29	**16.5002**	16.5002	16.5002	5,502.5	922.037
Methylcyclohexane**	108-87-2	C7H14	98.186	**4.1700**	4.094	10,789.34	**4.0234**	4.0234	4.0234	5,215.9	217.503
C8+ Heavies**	Various	C8+	138.00 est.	**33.8747**	46.747	123,186.69	**45.9374**	45.9374	45.9374	7,000.0	2371.231
Benzene***	71-43-2	C6H6	78.112	**0.0615**	0.048	126.59	**0.0472**	0.0472	0.0472	3,741.9	2.301
Ethylbenzene***	100-41-4	C8H10	106.165	**1.2000**	1.274	3,357.16	**1.2519**	1.2519	1.2519	5,222.0	62.664
Hexane, n-***	110-54-3	C6H14	86.175	**5.4700**	4.714	12,421.65	**4.6321**	4.6321	4.6321	4,756.0	260.153
Methanol (MeOH)	67-56-1	CH4O	32.042	---	---	---	---	---	---	866.90	---
Toluene***	108-88-3	C7H8	92.138	**0.6950**	0.640	1,687.46	**0.6293**	0.6293	0.6293	4,474.9	31.101
2,2,4-Trimethylpentane***	540-84-1	C8H18	114.229	**0.3760**	0.429	1,131.80	**0.4221**	0.4221	0.4221	6,213.6	23.363
Xylenes***	1330-20-7	C8H10	106.165	**1.5710**	1.668	4,395.08	**1.6390**	1.6390	1.6390	5,208.7	81.828
Totals:				**100.00**	**101.76**	**268,162**	**100.00**	**---**	**---**	**Calculated Btu/scf (HHV):**	**5,379**
THC:				**100.00**	**101.76**	**268,162**	**100.00**	**100.00**	**---**		
Total VOC:				**100.00**	**101.76**	**268,162**	**100.00**	**100.00**	**100.00**		
Total HAP:				**9.37**	**8.77**	**23,120**	**8.62**	**8.62**	**8.62**		

#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"		Margin for Changes in Future Condensate Composition
				110% VOC	200% HAP	
	Mole %	Wgt %	lb/MMscf	Wgt %	lb/MMscf	
CO2	---	---	---	---	---	--- Margin
Methane*	---	---	---	---	---	--- Margin
Other (N2, C2, O2, CO, H2O)	---	---	---	---	---	--- Margin
VOC**	100.00	100.00	268,162	100.00	295,000	10% Margin
Total Condensate	**100.00**	**100.00**	**268,162**	**100.00**	**295,000**	10% Margin
Benzene***	0.0615	0.05	126.59	0.09	260.00	105% Margin
Ethylbenzene***	1.2000	1.25	3,357.16	2.28	6,720	100% Margin
Hexane, n-***	5.4700	4.63	12,422	8.42	24,850	100% Margin
Methanol (MeOH)	---	---	---	9E-02	260.00	--- Margin
Toluene***	0.6950	0.63	1,687.46	1.15	3,380	100% Margin
2,2,4-Trimethylpentane***	0.3760	0.42	1,131.80	0.77	2,270	101% Margin
Xylenes***	1.5710	1.64	4,395.08	2.98	8,800	100% Margin
Total HAP***	**9.3735**	**8.62**	**23,120**	**15.78**	**46,540**	101% Margin

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

Stabilized Condensate - 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

Btu Load – Thermal Oxidizer (TO-01)

Component	Formula	Molecular Weight (MW)	Component Btu/scf (HHV)	Dehy-01/-02 Flash Gas Total Ave Flowrate: 2,640 scf/hr		Dehy-01/-02 Still Vents Total Ave Flowrate: 7,720 scf/hr		Purge, Fuel, and Pilot Ave Flowrate: 850 scf/hr		20% Contingency Ave Flowrate: 2,242 scf/hr		TOTAL Ave Flowrate: 13,452
				Mol%=Vol%	MMBtu/hr	Mol%=Vol%	MMBtu/hr	Mol%=Vol%	MMBtu/hr	Mol%=Vol%	MMBtu/hr	MMBtu/Hr
Water	H2O	18.02	---	**1.15E-01**	**---**	**8.81E+01**	**---**	---	---	**60.6990**	---	**---**
Carbon Monoxide	CO	28.01	---	---	---	---	---	---	---	---	---	**---**
Oxygen	O2	32.00	---	---	---	---	---	---	---	---	---	**---**
Carbon Dioxide	CO2	44.01	---	**5.51E-01**	**---**	**1.45E-01**	**---**	**0.0951**	---	**0.2368**	---	**---**
Hydrogen Sulfide	H2S	34.09	637.64	---	---	---	---	---	---	---	---	**---**
Nitrogen	N2	28.01	---	**4.42E-01**	**---**	**8.38E-03**	**---**	**0.5095**	---	**0.1485**	---	**---**
Methane	CH4	16.04	1,010.00	**5.08E+01**	1.3545	**9.93E-01**	0.0774	**72.7016**	0.6241	**18.1601**	0.4112	**2.47**
Ethane	C2H6	30.07	1,769.70	**2.71E+01**	1.2661	**1.99E+00**	0.2719	**16.1959**	0.2436	**8.9807**	0.3563	**2.14**
Propane	C3H8	44.10	2,516.20	**1.25E+01**	0.8303	**2.02E+00**	0.3924	**6.5622**	0.1404	**4.8325**	0.2726	**1.64**
i-Butane	C4H10	58.12	3,252.00	**1.32E+00**	0.1133	**3.37E-01**	0.0846	**0.6514**	0.0180	**0.5923**	0.0432	**0.26**
n-Butane	C4H10	58.12	3,262.40	**4.38E+00**	0.3772	**1.49E+00**	0.3753	**1.8900**	0.0524	**2.2009**	0.1610	**0.97**
i-Pentane	C5H12	72.15	4,000.90	**6.63E-01**	0.0700	**2.68E-01**	0.0828	**0.3456**	0.0118	**0.3669**	0.0329	**0.20**
n-Pentane	C5H12	72.15	4,008.90	**1.09E+00**	0.1154	**5.61E-01**	0.1736	**0.5068**	0.0173	**0.6815**	0.0613	**0.37**
Cyclopentane	C5H10	70.10	3,763.60	**---**	---	**---**	---	**---**	---	**---**	---	**---**
Cyclohexane	C6H12	84.16	4,481.60	**5.08E-02**	0.0060	**2.04E-01**	0.0706	**0.0174**	0.0007	**0.1538**	0.0155	**0.09**
Other Hexanes	C6H14	86.18	4,750.30	**3.08E-01**	0.0386	**3.41E-01**	0.1251	**0.1602**	0.0065	**0.3195**	0.0340	**0.20**
Heptanes	C7H16	100.20	5,502.50	**1.93E-01**	0.0280	**4.08E-01**	0.1733	**0.1090**	0.0051	**0.3347**	0.0413	**0.25**
Methylcyclohexane	C7H14	98.19	5,215.90	**4.70E-02**	0.0065	**2.50E-01**	0.1007	**0.0215**	0.0010	**0.1849**	0.0216	**0.13**
C8+ Heavies	C8+	130.00 est	7,150.00 est	**8.92E-03**	0.0017	**2.18E-01**	0.1203	**0.0449**	0.0027	**0.1556**	0.0249	**0.15**
Benzene	C6H6	78.11	3,741.90	**1.05E-02**	0.0010	**3.24E-01**	0.0936	**0.0026**	0.0001	**0.2258**	0.0189	**0.11**
Ethylbenzene	C8H10	106.17	5,222.00	**5.95E-04**	0.0001	**5.51E-02**	0.0222	**0.0003**	0.0000	**0.0381**	0.0045	**0.03**
n-Hexane	C6H14	86.18	4,756.00	**3.49E-01**	0.0438	**3.41E-01**	0.1252	**0.1742**	0.0070	**0.3302**	0.0352	**0.21**
Methanol (MeOH)	67-56-1	CH4O	866.90	**3.00E-04**	---	**3.00E-04**	---	**0.0003**	---	**0.0003**	---	**---**
Toluene	C7H8	92.14	4,474.90	**1.22E-02**	0.0014	**6.21E-01**	0.2145	**0.0039**	0.0001	**0.4308**	0.0432	**0.26**
2,2,4-TMP (i-Octane)	C8H18	114.23	6,213.60	**2.77E-03**	0.0005	**2.86E-03**	0.0014	**0.0022**	0.0001	**0.0028**	0.0004	**2E-03**
Xylenes	C8H10	106.17	5,208.67	**1.03E-02**	0.0014	**1.41E+00**	0.5670	**0.0040**	0.0002	**0.9738**	0.1137	**0.68**
				99.95		100.09		100.00		100.05		
			Average MMBtu/hr:	**4.26**		**3.07**		**1.13**		**1.69**		**10.15**
			Average scf/hr:	**2,640**		**7,720**		**850.00**		**2,242**		**13,452**
			Average Btu/scf:	**1,612**		**397.90**		**1,331**		**754.58**		**754.58**

Mol%=Vol% Values from GRI-GLYCalc Model Results

Appalachia Midstream Services, LLC

Pioneer Compressor Station

Application for Initial 45CSR30 Title V Operating Permit

Btu Load – Elevated Flare (FLR-01)

Component	Formula	Molecular Weight (MW)	Component Btu/scf (HHV)	CRP,CBD,PIG Mole % (M% = V%)	STAB Mole % (M% = V%)	CBD Flowrate: 2,710 scf/hr	PIG Flowrate: 1,127 scf/hr	STAB Flowrate: 78 scf/hr	Purge/Pilot Flowrate: 860 scf/hr	20% Cont Flowrate: 955 scf/hr	TOTAL Flowrate: 5,730
						MMBtu/hr	MMBtu/hr	MMBtu/hr	MMBtu/hr	MMBtu/hr	MMBtu/Hr
Water	H2O	18.02	---	---	**0.1777**	**---**	**---**	**---**	**---**	**---**	**---**
Carbon Monoxide	CO	28.01	---	---	0.0761	---	---	---	---	---	**---**
Oxygen	O2	32.00	---	---	---	---	---	---	---	---	**---**
Carbon Dioxide	CO2	44.01	---	**0.0951**	**0.0761**	**---**	**---**	**---**	**---**	**---**	**---**
Hydrogen Sulfide	H2S	34.09	637.64	---	---	---	---	---	---	---	**---**
Nitrogen	N2	28.01	---	**0.5095**	**0.0298**	**---**	**---**	**---**	**---**	**---**	**---**
Methane	CH4	16.04	1,010.00	**72.7016**	**17.7310**	1.9896	0.8274	0.0140	0.6315	0.7012	**4.16**
Ethane	C2H6	30.07	1,769.70	**16.1959**	**26.5614**	0.7766	0.3229	0.0369	0.2465	0.2737	**1.66**
Propane	C3H8	44.10	2,516.20	**6.5622**	**35.1000**	0.4474	0.1860	0.0693	0.1420	0.1577	**1.00**
i-Butane	C4H10	58.12	3,252.00	**0.6514**	**3.0724**	0.0574	0.0239	0.0078	0.0182	0.0202	**0.13**
n-Butane	C4H10	58.12	3,262.40	**1.8900**	**10.1604**	0.1671	0.0695	0.0260	0.0530	0.0589	**0.37**
i-Pentane	C5H12	72.15	4,000.90	**0.3456**	**1.7140**	0.0375	0.0156	0.0054	0.0119	0.0132	**0.08**
n-Pentane	C5H12	72.15	4,008.90	**0.5068**	**2.8255**	0.0551	0.0229	0.0089	0.0175	0.0194	**0.12**
Cyclopentane	C5H10	70.10	3,763.60	**---**	**---**	---	---	---	---	---	**---**
Cyclohexane	C6H12	84.16	4,481.60	**0.0174**	**0.0951**	0.0021	0.0009	0.0003	0.0007	0.0007	**5E-03**
Other Hexanes	C6H14	86.18	4,750.30	**0.1602**	**1.0480**	0.0206	0.0086	0.0039	0.0065	0.0073	**0.05**
Heptanes	C7H16	100.20	5,502.50	**0.1090**	**0.5417**	0.0163	0.0068	0.0023	0.0052	0.0057	**0.04**
Methylcyclohexane	C7H14	98.19	5,215.90	**0.0215**	**0.1125**	0.0030	0.0013	0.0005	0.0010	0.0011	**0.01**
C8+ Heavies	C8+	130.00 est	7,000.00 est	**0.0449**	**0.2285**	0.0085	0.0035	0.0013	0.0027	0.0030	**0.02**
Benzene	C6H6	78.11	3,741.90	**0.0026**	**0.0053**	0.0003	0.0001	2E-05	0.0001	0.0001	**6E-04**
Ethylbenzene	C8H10	106.17	5,222.00	**0.0003**	**0.0100**	4E-05	2E-05	4E-05	1E-05	1E-05	**1E-04**
n-Hexane	C6H14	86.18	4,756.00	**0.1742**	**0.4705**	0.0224	0.0093	0.0018	0.0071	0.0079	**0.05**
Methanol (MeOH)	67-56-1	CH4O	32.04	**0.0003**	**0.0003**	---	---	---	---	---	**---**
Toluene	C7H8	92.14	4,474.90	**0.0039**	**0.0001**	0.0005	0.0002	0.0000	0.0002	0.0002	**1E-03**
2,2,4-TMP (i-Octane)	C8H18	114.23	6,213.60	**0.0022**	**0.0177**	0.0004	0.0002	0.0001	0.0001	0.0001	**9E-04**
Xylenes	C8H10	106.17	5,208.67	**0.0040**	**0.0146**	0.0006	0.0002	6E-05	0.0002	0.0002	**1E-03**
				100.00	100.07						
				Average MMBtu/hr:		**3.61**	**1.50**	**0.18**	**1.14**	**1.27**	**7.70**
				Average scf/hr:		**2,710**	**1,127**	**78.44**	**860.00**	**954.96**	**5,730**
				Average Btu/scf:		**1,331**	**1,331**	**2,276**	**1,331**	**1,331**	**1,344**

Note: Stabilizer overheads flowrate expressed in scf/hr is prorated based on five days of operation per year when the overheads are directed to flare for control.

Supplement S5

Vendor Data

- **5,350 bhp CAT G3616LE-A4 Compressor Engine w/ OxCat**
- **Zeeco Z-HTO Thermal Oxidizer**
- **Zeeco MJ-16 Elevated Flare**

G3616

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED (rpm):	1000	RATING STRATEGY:	STANDARD
COMPRESSION RATIO:	7.6	RATING LEVEL:	CONTINUOUS
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	GAV
AFTERCOOLER - STAGE 2 INLET (°F):	90		WITH AIR FUEL RATIO CONTROL
AFTERCOOLER - STAGE 1 INLET (°F):	174	**SITE CONDITIONS:**	
JACKET WATER OUTLET (°F):	190	FUEL:	Williams Pioneer 1-20
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig): (See note 1)	58.0-70.3
COOLING SYSTEM:	JW+1AC, OC+2AC	FUEL METHANE NUMBER:	50.3
CONTROL SYSTEM:	ADEM4	FUEL LHV (Btu/scf):	1226
EXHAUST MANIFOLD:	DRY	ALTITUDE(ft):	1000
COMBUSTION:	LOW EMISSION	INLET AIR TEMPERATURE(°F):	77
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	STANDARD RATED POWER:	5350 bhp@1000rpm
SET POINT TIMING:	16		

				MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING		**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(WITHOUT FAN)	(2)	bhp	5350	5350	4013	2675
INLET AIR TEMPERATURE			°F	77	77	77	77
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(3)	Btu/bhp-hr	6649	6649	6829	7267
FUEL CONSUMPTION (HHV)		(3)	Btu/bhp-hr	7318	7318	7516	7998
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(4)(5)	ft3/min	12857	12857	9699	6637
AIR FLOW	(WET)	(4)(5)	lb/hr	57007	57007	43006	29427
FUEL FLOW (60ºF, 14.7 psia)			scfm	484	484	372	264
INLET MANIFOLD PRESSURE		(6)	in Hg(abs)	105.6	105.6	79.2	55.1
EXHAUST TEMPERATURE - ENGINE OUTLET		(7)	°F	799	799	863	923
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(8)(5)	ft3/min	32023	32023	25401	18203
EXHAUST GAS MASS FLOW	(WET)	(8)(5)	lb/hr	58719	58719	44325	30363
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(9)(10)	g/bhp-hr	0.50	0.50	0.50	0.50
CO		(9)(10)	g/bhp-hr	2.63	2.63	2.63	2.63
THC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	3.17	3.17	3.52	3.72
NMHC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	1.59	1.59	1.77	1.87
NMNEHC (VOCs) (mol. wt. of 15.84)		(9)(10)(11)	g/bhp-hr	0.87	0.87	0.96	1.02
HCHO (Formaldehyde)		(9)(10)	g/bhp-hr	0.20	0.20	0.21	0.23
CO2		(9)(10)	g/bhp-hr	451	451	462	490
EXHAUST OXYGEN		(9)(12)	% DRY	10.8	10.8	10.6	10.1
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(13)	Btu/min	53525	53525	43303	36777
HEAT REJ. TO ATMOSPHERE		(13)	Btu/min	17924	17924	16668	15153
HEAT REJ. TO LUBE OIL (OC)		(13)	Btu/min	32557	32557	28726	24908
HEAT REJ. TO A/C - STAGE 1 (1AC)		(13)(14)	Btu/min	48934	48934	23460	5887
HEAT REJ. TO A/C - STAGE 2 (2AC)		(13)(14)	Btu/min	19696	19696	14379	9260

COOLING SYSTEM SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW+1AC)	(14)(15)	Btu/min	110258
TOTAL STAGE 2 AFTERCOOLER CIRCUIT (OC+2AC)	(14)(15)	Btu/min	59749
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.

PREPARED BY:
Data generated by Gas Engine Rating Pro Version 7.00.02
Ref. Data Set EM0457-08-001, Printed 28Feb2020

NOTES

1. Fuel pressure range specified is to the engine gas shutoff valve (GSOV). Additional fuel train components should be considered in pressure and flow calculations.

2. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.

3. Fuel consumption tolerance is ± 2.5% of full load data.

4. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

5. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

6. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

7. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

8. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of ± 6 %.

9. Emissions data is at engine exhaust flange prior to any after treatment.

10. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate the maximum values expected under steady state conditions. Fuel methane number cannot vary more than ± 3. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.

11. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ

12. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.

13. 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.

14. 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.

15. 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	71.7722	71.7722
Ethane	C2H6	16.5489	16.5489
Propane	C3H8	6.8349	6.8349
Isobutane	iso-C4H1O	0.6918	0.6918
Norbutane	nor-C4H1O	2.0493	2.0493
Isopentane	iso-C5H12	0.3721	0.3721
Norpentane	nor-C5H12	0.5669	0.5669
Hexane	C6H14	0.5687	0.5687
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	0.5018	0.5018
Carbon Dioxide	CO2	0.0934	0.0934
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:	Williams Pioneer 1-20
Unit of Measure:	English

Calculated Fuel Properties

Caterpillar Methane Number:	50.3
Lower Heating Value (Btu/scf):	1226
Higher Heating Value (Btu/scf):	1349
WOBBE Index (Btu/scf):	1393
THC: Free Inert Ratio:	167.01
Total % Inerts (% N2, CO2, He):	0.6%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.996
Stoich A/F Ratio (Vol/Vol):	12.69
Stoich A/F Ratio (Mass/Mass):	16.37
Specific Gravity (Relative to Air):	0.775
Fuel Specific Heat Ratio (K):	1.271

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.

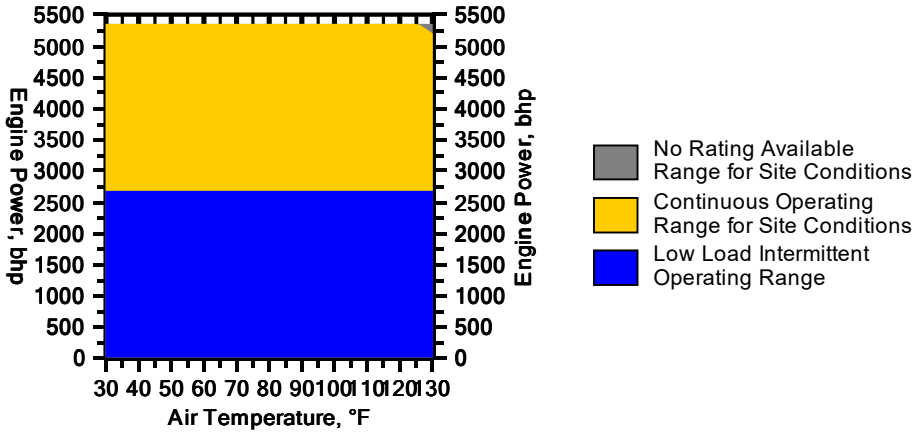
Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

FUEL LIQUIDS

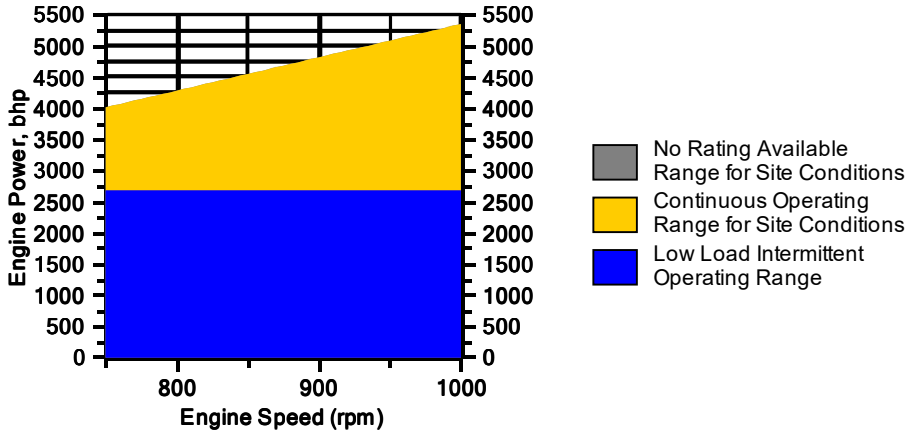
Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing 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.

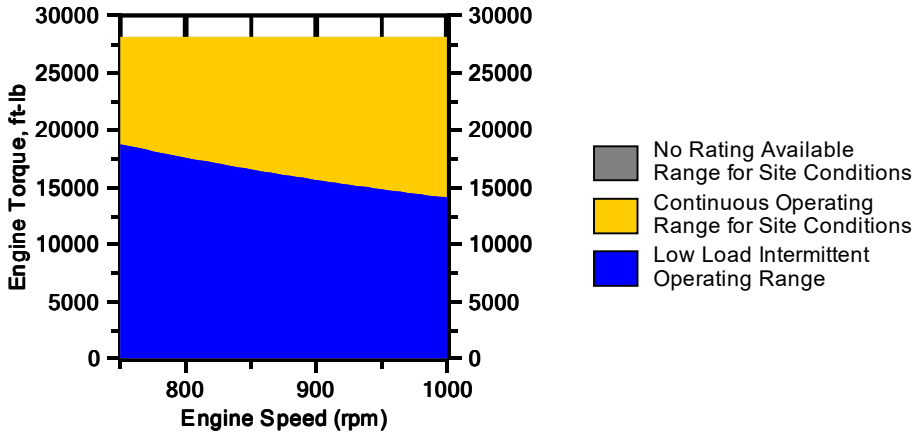
Engine Power vs. Inlet Air Temperature



Engine Power vs. Engine Speed



Engine Torque vs. Engine Speed



Power Emission Group
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Tel: (715) 568-2882 • Fax: (715)568-2884
Email bweninger@catalyticcombustion.com

CATALYTIC COMBUSTION
EMISSION TECHNOLOGIES

To Williams
Attn
Via E-mail

Our Ref. 001-00-266625.00 Pioneer
Date: 02 March, 2020
Page: 1 of 1

Catalyst Performance

For : Project/Location : Pioneer

Engine Parameters

				Raw Exhaust	
Engine Manufacturer	Caterpillar		NOx	0.50	g/bhp-hr
Engine Model	G3616		CO	2.63	g/bhp-hr
Horsepower	5350	bhp	NMHC	1.59	g/bhp-hr
Speed	1000	rpm	NMNEHC (VOC)	0.87	g/bhp-hr
Exhaust Flowrate	32023	acfm	HCHO	0.20	g/bhp-hr
Exhaust Temperature	799	° F	Oxygen	10.80	%
Fuel	Natural Gas				

Catalyst Description and Performance Expectations

Catalyst Model	REMB-4815F-D	Overall Dimensions	47.88 x 14.88 x 3.7
Cell Pattern, Substrate	20HF	Catalyst Qty Required	See Below per Unit
Formulation	HFX1	Pressure Drop	See Below inches of H2O

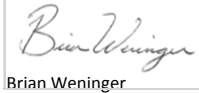
Parametric Study : No. Elements vs Catalyst Performance
Expected Fresh Performance

# Elements	NOx	CO	VOC	HCHO	dp	GHSV
1	0%	73%	15%	53%	42.50	636,269
2	0%	93%	28%	77%	17.00	318,135
3	0%	98%	40%	89%	10.40	212,090
4	0%	99%	49%	95%	7.40	159,067
5	0%	99%	57%	95%	5.80	127,254
6	0%	99%	64%	95%	4.70	106,045

General Terms and Conditions of Sale and Manufacturers Warranty documents are available upon request.

Please contact us if you have any questions or to let us know how we can be of further help.

Best regards,



Brian Weninger
Product and Application Engineer, Power Emission Group

• Burners
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www.zeeco.com
sales@zeeco.com

July 20, 2017

Williams - NE G&P
2000 Commerce Drive
Pittsburgh, PA 15275

Attention: Ignacio Russo
Ignacio.Russo@williams.com

Reference: Pioneer and Blake Ridge Thermal Oxidizers
Zeeco Proposal No. 2017-02645IN-01 Rev 4

Dear Mr. Russo:

Thank you for your inquiry. We appreciate this opportunity to provide our **revised** proposal **to include Waste Stream 5 & 6 as shown in the updated process data provided on July 18, 2017,** for the following equipment:

- Two (2) Zeeco Standard, Direct Fired Horizontal Thermal Oxidizer Packages

The attached proposal describes specific features and performance of Zeeco's standard thermal oxidizer system. Our design incorporates a proven thermal process to effectively treat the waste gas stream from your process. The design and materials of construction have been chosen to maximize on-line time and operational life.

Please note that the base of the thermal oxidizer is mounted on a pre-wired and pre-piped rectangular structural steel skid that will also house the fuel rack and control panel. This is intended to reduce installation time associated with interconnecting piping and wiring between the fuel rack/control panel and the thermal oxidizer.

Furthermore, the unit is ***NFPA 86 compliant*** to ensure personnel and equipment safety.

Again, we appreciate the opportunity to quote on your combustion equipment requirements. After you have had an opportunity to review our proposal, should you have any questions or require additional information, please contact me at (918)893-8416 or email me at sydney_levine@zeeco.com.

Best regards,

Sydney Levine
Applications Engineer

Cc: Ryan B. Tate, Zeeco- Broken Arrow

TABLE OF CONTENTS

1.0 INTRODUCTION

Zeeco has been designing and manufacturing burners, flares, incinerators, air pre-heaters, and combustion systems for world wide use since 1980.

Zeeco's Engineering Staff offers over 1,000 years of experience in the development, design, and testing of Combustion Systems. Zeeco has the proven skills and innovative abilities to design a practical and environmentally friendly combustion system to thermally treat virtually any industrial waste. This learned "art" gained by research and design efforts which are refined by testing and field experience has been implemented in the process plants of numerous industries throughout the world.

From project planning through design, procurement, manufacturing, installation, and even start-up, Zeeco will provide project management and support as deemed necessary. It is our world class HANDS ON type design skills, quality products, experienced staff, and especially our responsiveness to our customers needs that truly set Zeeco apart from our competition.

Quality: Our customers expect it. We demand it!

2.0 SCOPE OF SUPPLY

Zeeco will provide, as specified in your inquiry, One (1) Zeeco Standard Thermal Oxidizer Package for each location, Blake Ridge and Pioneer. A more detailed description of this equipment is included in Section 5.0 entitled: EQUIPMENT DESCRIPTION.

Our Scope of Supply **will include:**

- All Equipment as listed in this Proposal Designed as a Zeeco Standard Unit using Zeeco Standard Suppliers
- General Arrangement and Plot Layout Drawings for Customer Approval
- Required Documentation for Customer Information
- Field Service per the attached Rate Sheet
- Required Inspection and Testing as per Zeeco Standard Inspection and Test Plan

Our Scope of Supply **does not include:**

- Delivery to Jobsite
- Equipment Anchor Bolts, Templates or Slide Plates
- Field Installation and/or Erection
- Start-Up (available on a per diem basis)
- Foundations or Foundation Design
- Environmental Licensing, Registration and Associated Testing
- Area Lighting
- Heat Tracing and External Insulation
- Oxygen Analyzer (can be included as an option)
- Detonation Arrestor (can be included as an option)
- Knock Out Drum (can be included as an option)
- Waste Block Valves or Controls (can be included as an option)
- Process Control System (can be included as an option)

The Zeeco standard, skid mounted horizontal thermal oxidizer package can ship ***32 weeks*** from the date of firm order commitment and release to proceed with procurement of raw materials. One (1) review and approval cycle has been considered in the above shipping schedule and consists of the following:

1. Williams has 2 weeks to review initial submissions of Zeeco's standard drawing and documentation package
2. Zeeco to update the documents and drawings as necessary and send final revision within 2 weeks of receiving the formal drawing comments

Both options presented above are based on using the Zeeco existing standard design and on current materials availability, drafting, and shop schedules. Expedited delivery is available if required. Please contact Zeeco for an updated proposal.

3.5 Preliminary Shipping Weights:

Blake Ridge & Pioneer Scope- Skidded Horizontal Zeeco Standard Thermal Oxidizers

Item	Approximate Shipping Weight (lb)	Approximate Shipping Dimensions
Skid including thermal oxidizer base with refractory installed, fuel rack, and combustion air fan	10,200	8' W x 20' L x 8' H
Thermal Oxidizer Stack	6,000	3' W x 3' L x 22' H

3.6 Start-Up

Start-up and installation are not included in this proposal. If such assistance is required it will be charged in accordance with Zeeco's Standard Rate Schedule attached.

3.7 Limited Liability

Seller shall not be liable for any loss of profit, special, indirect, incidental or consequential damages whether arising under warranty, contract, strict liability, indemnification, or any other cause or combination of causes whatsoever. This limitation shall apply notwithstanding any failure of essential purpose of any limited remedy.

Seller's cumulative liability, inclusive of insurance proceeds paid to Agent under Seller's insurance policies and liquidated damages paid to Agent, shall in no event be in excess of the value of the purchase price, whether arising under warranty, contract, strict liability, indemnification, or any other cause or combination of causes whatsoever. These limitations shall prevail over any conflicting or inconsistent provisions stated elsewhere.

4.0 DESIGN BASIS

4.1 Site Conditions

Elevation, feet	Blake Ridge: 1,450 Pioneer: 1,250
Barometric Pressure, psia	13.9
Temperature, ^{o}F (Min/Max)	-20* / 100
Design Relative Humidity	90% (assumed)
Wind Design	ASCE 7-10, 120MPH

*Note: The Thermal Oxidizer package is acceptable to -20°F with the exception of the HMI, which is guaranteed to 32°F.

4.2 Waste Stream Summary

	PIONEER					
	Waste Gas 1	**Waste Gas 2**	**Waste Gas 3**	**Waste Gas 4**	**Waste Gas 5**	**Waste Gas 6**
	Mol %	**Mol %**	**Mol %**	**Mol %**	**Mol %**	**Mol %**
Water	85.80192	85.80192	0.1649743	0.1649743	**0**	**0**
TEG	0.0001174	0.0001174	0.0001382	0.0001382	**0**	**0**
Nitrogen	0.00054	0.00054	0.0896987	0.0896987	**0**	**0**
Methane	1.3688041	1.3688041	51.344687	51.344687	**0**	**0**
CO2	0.1482647	0.1482647	0.5000099	0.5000099	**0**	**0**
Ethane	2.7699719	2.7699719	26.727424	26.727424	**0**	**0**
Propane	2.8329436	2.8329436	13.104553	13.104553	**20.986107**	**20.983331**
i-Butane	0.3045151	0.3045151	1.1240846	1.1240846	**11.165111**	**11.16968**
n-Butane	1.7903509	1.7903509	4.4060352	4.4060352	**41.265849**	**41.265083**
i-Pentane	0.4968271	0.4968271	0.6435775	0.6435775	**6.8906596**	**6.891371**
n-Pentane	1.0508567	1.0508567	1.1111151	1.1111151	**10.954713**	**10.953998**
2,3-Dimethylbutane	0.3533435	0.3533435	0.2251448	0.2251448	**2.4705339**	**2.4699713**
3-Methylpentane	0.2620526	0.2620526	0.1449929	0.1449929	**1.5553963**	**1.5556149**
Hexane	0.2724999	0.2724999	0.1442947	0.1442947	**1.7404499**	**1.7402445**
2,2-Dimethylpentane	0.0025424	0.0025424	0.0011917	0.0011917	**0.0151192**	**0.0151176**
Methylcyclopentane	0.1080608	0.1080608	0.0169657	0.0169657	**0.1282144**	**0.1282291**
Benzene	0.1038125	0.1038125	0.0027162	0.0027162	**0.0118769**	**0.0118758**
3,3-Dimethylpentane	0.0034755	0.0034755	0.0010277	0.0010277	**0.0124009**	**0.0124003**
Cyclohexane	0.131173	0.131173	0.0224721	0.0224721	**0.167149**	**0.1671086**
2-Methylhexane	0.1065749	0.1065749	0.0363433	0.0363433	**0.1272613**	**0.127264**
2,3-Dimethylpentane	0.0047007	0.0047007	0.0012513	0.0012513	**0.0152063**	**0.0152027**
3-Methylhexane	0.1157544	0.1157544	0.0319648	0.0319648	**0.4129168**	**0.4128873**
Heptane	0.2365455	0.2365455	0.0588878	0.0588878	**0.8027164**	**0.8024295**

Toluene	0.4661113	0.4661113	0.0063571	0.0063571	**0.0374895**	**0.0374861**
Octane	0.0781148	0.0781148	0.0112213	0.0112213	**0.1909147**	**0.1908976**
Ethylbenzene	0.2614509	0.2614509	0.0023632	0.0023632	**0.021013**	**0.021008**
o-Xylene	0.0583867	0.0583867	0.0003829	0.0003829	**0.002905**	**0.0029045**
2-Methylheptane	0.0569704	0.0569704	0.0108261	0.0108261	**0.1766993**	**0.1767202**
Methylcyclohexane	0.2703071	0.2703071	0.0339189	0.0339189	**0.3790713**	**0.3790206**
2,5-Dimethylhexane	0.0086627	0.0086627	0.0024037	0.0024037	**0.0391255**	**0.0391205**
1,t-3-Dimethylcyclohexane	0.0103362	0.0103362	0.0007206	0.0007206	**0.0109802**	**0.0109802**
Nonane	0.024489	0.024489	0.0018243	0.0018243	**0.043396**	**0.0433819**
n-Undecane	0.000775	0.000775	1.57E-05	1.57E-05	**5.70E-04**	**5.70E-04**
n-Decane	0.0060499	0.0060499	0.0002399	0.0002399	**0.0076207**	**0.007618**
Dodecane	0.0001128	0.0001128	1.19E-06	1.19E-06	**5.64E-05**	**5.64E-05**
Tridecane	1.54E-05	1.54E-05	9.25E-08	9.25E-08	**5.43E-06**	**5.42E-06**
Tetradecane	1.82E-06	1.82E-06	7.74E-09	7.74E-09	**5.72E-07**	**5.73E-07**
Pentadecane	4.66E-07	4.66E-07	1.65E-09	1.65E-09	**1.56E-07**	**1.56E-07**
Hexadecane	3.63E-07	3.63E-07	1.22E-09	1.22E-09	**1.24E-07**	**1.24E-07**
Heptadecane	7.27E-08	7.27E-08	2.40E-10	2.40E-10	**2.76E-08**	**2.76E-08**
Octadecane	2.96E-08	2.96E-08	8.59E-11	8.59E-11	**1.08E-08**	**1.08E-08**
Nonadecane	7.95E-09	7.95E-09	1.99E-11	1.99E-11	**2.49E-09**	**2.50E-09**
Eicosane	2.53E-09	2.53E-09	4.46E-12	4.46E-12	**9.04E-10**	**9.05E-10**
C21	2.31E-09	2.31E-09	4.13E-12	4.13E-12	**1.05E-09**	**1.05E-09**
C22	2.03E-09	2.03E-09	3.57E-12	3.57E-12	**8.08E-10**	**8.08E-10**
C23	8.64E-10	8.64E-10	1.47E-12	1.47E-12	**4.00E-10**	**4.00E-10**
C24	1.92E-11	1.92E-11	0	0	**2.17E-11**	**2.17E-11**
m-Xylene	0.1335432	0.1335432	0.0011677	0.0011677	**0.0139191**	**0.0139206**
p-Xylene	0.1275405	0.1275405	0.0012043	0.0012043	**0.0102296**	**0.0102275**
2,2,4-Trimethylpentane	0.0100727	0.0100727	0.002629	0.002629	**0.0369041**	**0.0368986**
2,4-Dimethylpentane	0.0009178	0.0009178	0.0004242	0.0004242	**0.0055755**	**0.0055764**
3-Ethylpentane	0.0196507	0.0196507	0.0046713	0.0046713	**0.057195**	**0.0571814**
2,4-Dimethylhexane	0.0104157	0.0104157	0.0025313	0.0025313	**0.0382339**	**0.0382293**
trans-1,2-Dimethylcyclohexane	0.1165761	0.1165761	0.0088281	0.0088281	**0.1352164**	**0.135206**
cis-1,2-Dimethylcyclohexane	0.0566796	0.0566796	0.0032722	0.0032722	**0.0511976**	**0.0511875**
cis-1,3-Dimethylcyclohexane	0.0171711	0.0171711	0.0014461	0.0014461	**0.0199998**	**0.0199939**
PRESSURE	0.1 psig	0.1 psig	57 psig	57 psig	**1 psig**	**1 psig**
TEMPERATURE	205 F	205 F	108 F	108 F	**100 F**	**100 F**
MW	23.5	23.5	27.6	27.6	**60.6**	**60.6**

FLOW RATE	230 lb/hr	230 lb/hr	104 lb/hr	104 lb/hr	**23 lb/hr**	**3 lb/hr**

	BLAKE RIDGE					
	Waste Gas 1	**Waste Gas 2**	**Waste Gas 3**	**Waste Gas 4**	**Waste Gas 5**	**Waste Gas 6**
	Mol %	**Mol %**	**Mol %**	**Mol %**	**Mol %**	**Mol %**
Water	90.708664	90.708664	0.2017609	0.2017609	**0**	**0**
TEG	0.0001122	0.0001122	0.0001397	0.0001397	**0**	**0**
Nitrogen	0.0004032	0.0004032	0.0852151	0.0852151	**0**	**0**
Methane	1.3278677	1.3278677	63.75814	63.75814	**0**	**0**
CO2	0.163891	0.163891	0.7111178	0.7111178	**0**	**0**
Ethane	1.7101505	1.7101505	21.237356	21.237356	**0**	**0**
Propane	1.396036	1.396036	8.3472711	8.3472711	**38.323047**	**38.323876**
i-Butane	0.2289641	0.2289641	1.0938283	1.0938283	**12.777954**	**12.779927**
n-Butane	0.7701528	0.7701528	2.4546063	2.4546063	**26.131425**	**26.134075**
i-Pentane	0.363147	0.363147	0.6120734	0.6120734	**6.9368491**	**6.9331473**
n-Pentane	0.4541709	0.4541709	0.6269606	0.6269606	**6.4849562**	**6.481844**
2,3-Dimethylbutane	0.3026362	0.3026362	0.2514102	0.2514102	**2.7623678**	**2.7629963**
3-Methylpentane	0.2249217	0.2249217	0.1619479	0.1619479	**1.7231632**	**1.7234484**
Hexane	0.2326474	0.2326474	0.1614611	0.1614611	**1.8912048**	**1.8915898**
2,2-Dimethylpentane	0.0021887	0.0021887	0.0013412	0.0013412	**0.0160914**	**0.0160933**
Methylcyclopentane	0.089903	0.089903	0.0185289	0.0185289	**0.1400683**	**0.1401048**
Benzene	0.0844365	0.0844365	0.0028887	0.0028887	**0.0131832**	**0.0131829**
3,3-Dimethylpentane	0.0029518	0.0029518	0.0011436	0.0011436	**0.0130236**	**0.0130266**
Cyclohexane	0.107881	0.107881	0.0241539	0.0241539	**0.18067**	**0.1806805**
2-Methylhexane	0.0909396	0.0909396	0.0406738	0.0406738	**0.1313767**	**0.1314031**
2,3-Dimethylpentane	0.003982	0.003982	0.0013899	0.0013899	**0.0157618**	**0.0157643**
3-Methylhexane	0.0980455	0.0980455	0.0355655	0.0355655	**0.4234141**	**0.4236583**
Heptane	0.199117	0.199117	0.0652781	0.0652781	**0.8041488**	**0.803854**
Toluene	0.3817306	0.3817306	0.0068002	0.0068002	**0.0378072**	**0.0378085**
Octane	0.0655045	0.0655045	0.0124363	0.0124363	**0.1754799**	**0.1754847**
Ethylbenzene	0.2156914	0.2156914	0.0025333	0.0025333	**0.0193993**	**0.0193989**
o-Xylene	0.0487716	0.0487716	0.0004097	0.0004097	**0.0026479**	**0.002648**
2-Methylheptane	0.0482573	0.0482573	0.0120698	0.0120698	**0.1662129**	**0.1662205**
Methylcyclohexane	0.2229197	0.2229197	0.0366772	0.0366772	**0.3825573**	**0.3825713**
2,5-Dimethylhexane	0.0073056	0.0073056	0.002683	0.002683	**0.0378094**	**0.0378049**
1,t-3-Dimethylcyclohexane	0.0085951	0.0085951	0.0007932	0.0007932	**0.0102749**	**0.0102757**
Nonane	0.0216021	0.0216021	0.0021341	0.0021341	**0.0377681**	**0.0377642**
n-Undecane	0.0007895	0.0007895	2.13E-05	2.13E-05	**4.84E-04**	**4.84E-04**
n-Decane	0.0056354	0.0056354	0.0002983	0.0002983	**0.0065143**	**0.0065136**

Dodecane	0.0001279	0.0001279	1.79E-06	1.79E-06	**4.80E-05**	**4.80E-05**
Tridecane	1.94E-05	1.94E-05	1.51E-07	1.51E-07	**4.62E-06**	**4.61E-06**
Tetradecane	2.67E-06	2.67E-06	1.38E-08	1.38E-08	**4.87E-07**	**4.86E-07**
Pentadecane	7.98E-07	7.98E-07	3.16E-09	3.16E-09	**1.32E-07**	**1.32E-07**
Hexadecane	7.03E-07	7.03E-07	2.55E-09	2.55E-09	**1.05E-07**	**1.05E-07**
Heptadecane	1.56E-07	1.56E-07	5.45E-10	5.45E-10	**2.34E-08**	**2.34E-08**
Octadecane	6.79E-08	6.79E-08	2.09E-10	2.09E-10	**9.12E-09**	**9.12E-09**
Nonadecane	1.99E-08	1.99E-08	5.22E-11	5.22E-11	**2.13E-09**	**2.12E-09**
Eicosane	6.78E-09	6.78E-09	1.24E-11	1.24E-11	**7.67E-10**	**7.68E-10**
C21	6.60E-09	6.60E-09	1.20E-11	1.20E-11	**8.88E-10**	**8.88E-10**
C22	6.16E-09	6.16E-09	1.06E-11	1.06E-11	**6.86E-10**	**6.85E-10**
C23	2.49E-09	2.49E-09	3.87E-12	3.87E-12	**3.39E-10**	**3.40E-10**
C24	4.45E-11	4.45E-11	7.76E-14	7.76E-14	**1.85E-11**	**1.85E-11**
m-Xylene	0.1106692	0.1106692	0.0012565	0.0012565	**0.0127826**	**0.0127818**
p-Xylene	0.1057971	0.1057971	0.0012974	0.0012974	**0.0094165**	**0.0094196**
2,2,4-Trimethylpentane	0.0086311	0.0086311	0.002963	0.002963	**0.0370198**	**0.037021**
2,4-Dimethylpentane	0.0007906	0.0007906	0.0004778	0.0004778	**0.0058991**	**0.0058979**
3-Ethylpentane	0.0165798	0.0165798	0.0051684	0.0051684	**0.0585258**	**0.0585323**
2,4-Dimethylhexane	0.0087772	0.0087772	0.0028154	0.0028154	**0.0371051**	**0.0370923**
trans-1,2-Dimethylcyclohexane	0.0971593	0.0971593	0.0097175	0.0097175	**0.1272388**	**0.1272405**
cis-1,2-Dimethylcyclohexane	0.0471172	0.0471172	0.0036043	0.0036043	**0.0473183**	**0.0473343**
cis-1,3-Dimethylcyclohexane	0.0143137	0.0143137	0.0015894	0.0015894	**0.0189802**	**0.0189809**
PRESSURE	0.1 psig	0.1 psig	57 psig	57 psig	**1 psig**	**1 psig**
TEMPERATURE	205 F	205 F	108 F	108 F	**100 F**	**100 F**
MW	23.7	23.7	24.6	24.6	**57.7**	**57.7**
FLOW RATE	267 lb/hr	267 lb/hr	108 lb/hr	108 lb/hr	**30 lb/hr**	**3.3 lb/hr**

Waste streams for both locations are assumed to be in vapor phase, no liquid has been considered within this design. For both locations, it has been assumed that Waste Streams 1 and 2 are together in one pipe coming to the thermal oxidizer, Waste 3 and 4 are in together in one pipe and Wastes 5 & 6 are combined into one pipe.

4.3 Utilities

Electrical Power	460V / 3 Phase / 60 Hz
Instrument Air, SCFH	2000
Maximum Fuel Gas Required, MMBtu/Hr	1

4.4 Flue Gas Summary

	PIONEER at 1800F Operating Temperature			
	Waste Gas 1, 2, 3, 4, 5 & 6	Waste Gas 1, 2, 3, 4 & 6	Waste Gas 1, 3, 5 & 6	Waste Gas 1, 3 & 6
	Mol %	Mol %	Mol %	Mol %
Carbon Dioxide	4.81	4.81	4.84	4.82
Water	15.89	16.06	15.64	15.92
Nitrogen	69.17	69.05	69.41	69.22
Oxygen	10.12	10.08	10.11	10.04
Total, lb/hr	16,972	16,079	9,858	8,976
Mol. Wt.	27.6	27.6	27.6	27.6

	BLAKE RIDGE at 1800F Operating Temperature			
	Waste Gas 1, 2, 3, 4, 5 & 6	Waste Gas 1, 2, 3, 4 & 6	Waste Gas 1, 3, 5 & 6	Waste Gas 1, 3 & 6
	Mol %	Mol %	Mol %	Mol %
Carbon Dioxide	4.76	4.75	4.78	4.75
Water	16.97	17.28	16.53	17.02
Nitrogen	68.38	68.16	68.77	68.42
Oxygen	9.89	9.81	9.92	9.80
Total, lb/hr	16,480	15,313	9,755	8,601
Mol. Wt.	27.5	27.4	27.5	27.5

4.5 System Performance

Stack Parameter	Guaranteed Values
VOC Destruction Efficiency	99.5 %

These values are understood to apply only when the system is operated in accordance with the operating conditions stipulated in the design summary and for the waste(s) stipulated in the design basis sections of this proposal.

5.0 PROCESS DESCRIPTION

The Horizontal Forced Draft Thermal Oxidizer is equipped with one (1) GB-Series Fuel Gas Burner. The system is purged using the combustion blower provided. When the purge cycle is complete, the burner pilot is ignited via electric ignition. Once the burner pilot flame is proven, the main burner flame is ignited.

The thermal oxidizer is then allowed to achieve a waste permissive temperature of 1800°F for Blake Ridge and Pioneer. Waste gas can then be introduced into the thermal oxidizer. The thermal oxidizer controlled temperature and residence time ensures that the waste gasses are destroyed using a minimum fuel quantity. The flue gases from the thermal oxidizer exit to atmosphere via the refractory lined vent stack.

- Manufacturer's standard construction
- Manufacturer's standard paint system

6.5 Instrumentation & Controls

Instrumentation will be provided as shown on the attached P&ID by Zeeco Standard Suppliers. Some scope shown in P&ID is option scope as defined in this proposal. Zeeco's scope includes:

1. Pre-assembled fuel gas and instrument air control rack, skid mounted.
2. Instrument and piping connections from fuel rack to burner.
3. Rack mounted local control panel with BMS PLC only and provision to use the customer DCS for process control functions.
4. The BMS complies with NFPA 86; this proposal offers a SIL 2 compliant Siemens PLC.

Zeeco has considered the process control package, waste gas piping and instrumentation to be provided by others. However, these items can be provided by Zeeco upon request. **Zeeco has included an oxygen analyzer within the base scope of supply.**

7.0 EQUIPMENT DESCRIPTION--PIONEER

7.1 Standard Horizontal Thermal Oxidizer

One (1) standard horizontal thermal oxidizer is offered. It is designed to operate at 1800^{o}F with excess air to ensure complete combustion of the waste gas combustible components. The thermal oxidizer has the following features:

- Nominal 5'-0" O.D. x 20'-0" overall skid length
- Includes 3'-6" O.D. Stack
- Discharge height of 20'-0" above grade
- Thermal oxidizer and Stack Shell Material: SA-36
- All Carbon Steel External Surfaces Sandblasted and Painted per Williams Above Ground Protective Coating Specification, 09 96 10C Revision 01.02
- The base portion of the thermal oxidizer shall be mounted on a structural steel skid, along with the waste gas piping, fuel metering rack, and control panel. Skid dimensions will be approximately 8' W x 20 L x 8' H.
- The stack portion of the thermal oxidizer shall be shipped loose for bolting to the base portion in the field.

7.2 Burner

One (1) Forced Draft Burner Assembly is offered and will consist of One (1) Zeeco GB-Series Burner. The Burner is specially designed for forced draft operation and has the following features:

- 1.0 MMBtu/hr maximum fuel gas release rating
- High Energy Electric Spark Ignition System
- A-36 Carbon Steel Construction
- 60% Al_2O_3 Burner Tile Construction
- All Carbon Steel External Surfaces Sandblasted and Painted per Williams Above Ground Protective Coating Specification, 09 96 10C Revision 01.02
- **10**:1 Fuel Gas Turndown

7.3 Combustion Air Blower

- **4153 ACFM** at 100°F
- **5**" H_2O static pressure
- < **7.5** HP Motor
- Manufacturer's standard construction
- Manufacturer's standard paint system

7.4 Refractory

The refractory will be supplied and shop installed by Zeeco. Refractory material proposed within the thermal oxidizer chamber is a hard castable lining supplied by Zeeco standard suppliers. Refractory material for the stack has been quoted with a ceramic fiber lining due to the increased stack size.

7.5 Instrumentation and Controls

Zeeco's Standard Burner Management System Instrumentation and Controls scope is offered by Zeeco Standard Suppliers:

5. Pre-assembled fuel gas and instrument air control rack, skid mounted.
6. Instrument and piping connections from rack to field instruments and other field equipment by others.
7. Rack mounted local control panel with BMS PLC only and provision to use the customer DCS for process control functions.
8. The BMS complies with NFPA 86; this proposal offers a Siemens ET200S with a VFD included in the Panel.

Zeeco has considered the process control package, waste gas piping and instrumentation to be provided by others. However, these items can be provided by Zeeco upon request. **Zeeco has included an oxygen analyzer within the base scope of supply.**

8.0 PERFORMANCE WARRANTY

Zeeco warranties the system performance stated in this proposal. These values are understood to apply only when the system is operated in accordance with the operating conditions stipulated in the **DESIGN SUMMARY** for the waste (s) stipulated in the **DESIGN BASIS** sections of this proposal.

The purchaser, at his option and cost, may conduct a performance test to determine if the performance warranties are being met. The purchaser shall provide sufficient written notice to Zeeco so that a representative of Zeeco can witness the test. Additionally, Zeeco will be given access to all operating data and laboratory analysis that would bear on the final determination of performance. All analysis of operating data will be done in accordance with generally accepted engineering practice and only published physical data will be used.

-Burners
-Flares
-Incinerators

22151 East 91st Street
Broken Arrow, OK 74014 USA
Phone: 918-258-8551
Fax: 918-251-5519
www.zeeco.com

PRICED

July 13, 2017

Williams
Park Place Corporate Center 2
2000 Commerce Drive
Pittsburgh, PA 15275
Ph: 412-787-3132
fax:

Attention: Austin Day, Sr. Project Engr

Subject: Williams Ref.: Pioneer
Zeeco Reference: 2017-03133FL-01 -- Rev. 2

Thank you for your interest in Zeeco, Inc. We look forward to the opportunity to work with you on this project. In response to your above referenced inquiry, we are pleased to provide you with our proposal for the combustion equipment designed specifically for your needs.

Zeeco's flare systems are designed to handle peak releases immediately, with no adverse effects on the flare itself or on the pilots or ignition system. Zeeco's design also offers exceptional reliability and life expectancy as well as provisions for easy maintenance and repair.

Zeeco appreciates the opportunity to propose our products to Williams. We are confident that we offer the best flaring equipment in the world at competitive prices. Should you have additional questions or require additional information, please feel free to contact us.

Best Regards,

Nikki Jenlink
Flare Application Engineer
(reach me by email at: nikki_jenlink@zeeco.com)

Flare Tip Specification Sheet

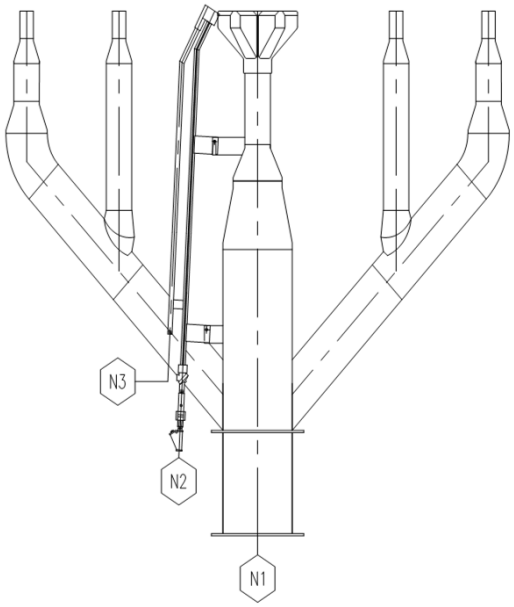
Client:	Williams	Zeeco Ref.:	2017-03133FL-01	Date:	13-Jul-17
Location:	West Virgina	Client Ref.:	Pioneer	Rev.	2

General Information:

Tag No.:	FL-7002 Pioneer	
Model:	MJ-16	Type: Sonic
Length:	10'- 0 "	
Weight:	1298.26444444444 lbs	
No. of Pilots:	2	

Design Case:

Governing Case:	Pioneer Max
Molecular Weight:	22.0
L. H. V. :	1,200 BTU/SCF
Temperature:	-26 Deg. F
Available Static Pressure:	35 psig
Design Flow Rate:	460,660 lbs/hr
Approximate Exit Velocity:	1129 ft/s
Mach No.:	1.00
Approx. Tip Press. Drop:	31.14 psig



(Typical drawing only)

Construction:

Upper Section:	310 SS	Windshield:	NO
Lower Section:	304 SS	Flame Retention Ring:	n/a
Refractory:	None	Lifting Lugs:	YES - S.S. Type
Refractory Thk:	N/A		

Surface Finish (Carbon Steel Surfaces):

Surface Preparation:	SSPC-SP6	Primer:	Inorganic Zinc
Paint (c. s. surfaces):	High Heat Aluminum		

Connections:

	Qty.	Size	Type	Material
N1 - Flare Gas Inlet:	1	16 "	150# RFSO	304 SS
N2 - Pilot Gas:	1	1"	150# RFSW	304 SS
N3 - Ignition Line:	2	1 "	FNPT	304 SS

Miscellaneous Notes:

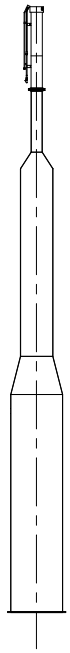
1. Includes Integral Purge Reducing Velocity Seal.
2. Required Fuel Gas Purge Rate = 760 SCFH.

Self-supported Flare Stack Specification Sheet

Client:	Williams	Zeeco Ref.:	2017-03133FL-01	Date:	13-Jul-17
Location:	West Virgina	Client Ref.:	Pioneer	Rev.:	2

General Information:

Tag No.:	FL-7002 Pioneer
Overall Height:	145'- 0 "



(Typical drawing only)

Design Criteria:

Wind Design Code:	ASCE 7-10	
Seismic Design Code:	ASCE 7-10	
Importance Factor:	1.25	
Structural Design Code:	AISC	
Wind Speed (Structural):	120	mph
Seismic Zone:	D	
Max. Design Temperature:	150	Deg. F
Min. Design Temperature:	-65	Deg. F
Design Pressure:	50	psig
Riser Corrosion Allow.:	0.000	in.

Construction:

Inner Gas Riser Material:	304 SS	Ladders & Step-offs:	per OSHA
Inner Gas Riser Diameter:	18"	Platform at Tip:	360 deg
Outer Support Stack Material:	A36CS	Additional Platforms:	None
Outer Support Stack Diameter:	Varies Along Height (for SS Stack)	ACWL:	None

Surface Finish (Carbon Steel Surfaces):

Surface Preparation:	Per Spec	Primer:	Per Spec
Int. Coat:	Per Spec	Finish Paint:	Per Spec

Utility Piping:

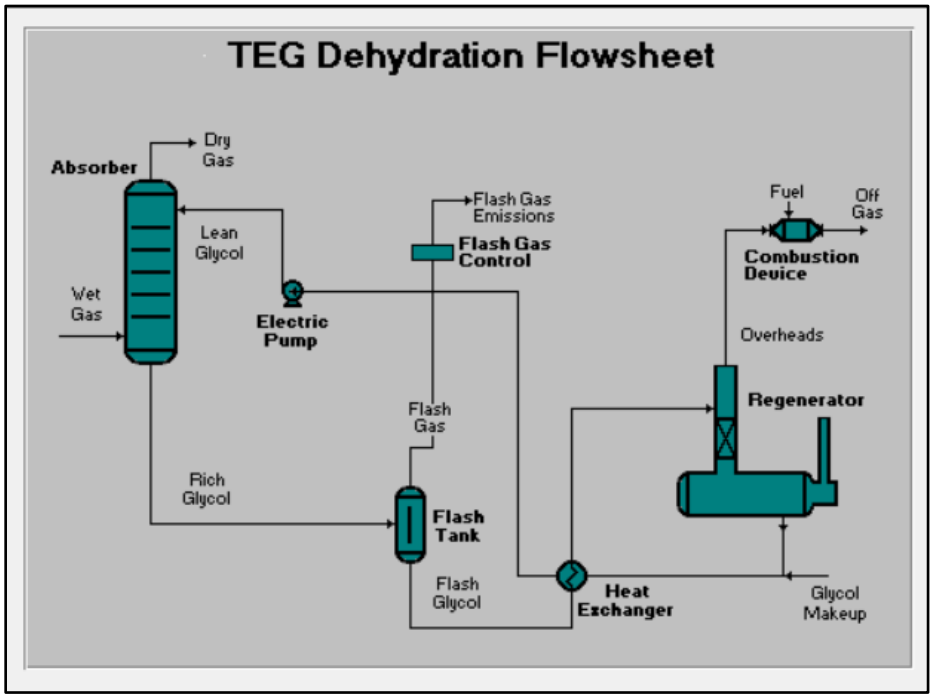
Per Attached Utility Piping Scope of Supply

Miscellaneous Notes:

Supplement S6

Emission Program Data

- **EPA Tanks 4.0.9d – Stabilized Condensate – Tank Emissions**
- **EPA Tanks 4.0.9d – Produced Water – Tank Emissions**
- **GRI-GLYCalc – 125.0 MMscfd Dehydrator**



Condensate Storage Tanks (TK-01 thru TK-06)

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

Identification

User Identification:	AMS-Pioneer- 400 bbl Stabilized Condensate
City:	Moundsville
State:	Ohio
Company:	Appalchia Midstream Services, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	TK-01 thru TK-06

Tank Dimensions

Shell Height (ft):	20.00
Diameter (ft):	12.00
Liquid Height (ft) :	19.00
Avg. Liquid Height (ft):	10.00
Volume (gallons):	16,800.00
Turnovers:	70.00
Net Throughput(gal/yr):	1,176,000.00
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

Stabilized Condensate (Pre-Control)

Tank Dimensions	Per Tank		Six (6) Tanks	
	gal	bbl	gal	bbl
Capacity	16,800	**400**	100,800	2,400
Daily T-Put	3,222	76.71	19,332	460.27
Annual T-Put	1,176,000	**28,000**	7,056,000	168,000

VOC Emissions	Per Tank		Six (6) Tanks	
	lb/yr	tpy	lb/yr	tpy
Working	**6,303**	3.15	37,816	18.91
Breathing	**2,099**	1.05	12,596	6.30
Total	**8,402**	4.20	50,412	25.21

Emissions Report for: Annual

AMS-Pioneer- 400 bbl Stabilized Condensate - Vertical Fixed Roof Tank
Moundsville, Ohio

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 12)	6,302.71	2,099.36	8,402.07

Produced Water (PW) - Storage Tanks (TK-07, TK-08)

TANKS 4.0.9d
Emissions Report - Detail Format

Identification

User Identification:	AMS-MtrCS-Produced Water
City:	Wellsburg
State:	West Virginia
Company:	Appalachia Midstream Services, LLC (AMS)
Type of Tank:	Vertical Fixed Roof Tank
Description:	Each of Two (2) 400 bbl Produced Water Storage Tanks.

Tank Dimensions

Shell Height (ft):		20.00
Diameter (ft):		12.00
Liquid Height (ft) :		19.00
Avg. Liquid Height (ft):		10.00
Volume (gallons):		16,800.00
Turnovers:		39.19
Net Throughput(gal/yr):		630,000.00
Is Tank Heated (y/n):	Y	

Paint Characteristics

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

Roof Characteristics

Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Press

AMS-MtrCS-Produced Water - Vertical Fixed Roof Tank
Wellsburg, 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.
Produced Water	All	60.00	60.00	60.00	60.00	0.3366	0.3366	0.3366	28.3885
Gasoline (RVP 15.0)						8.1484	8.1484	8.1484	60.0000

Emissions Report for: Annual

AMS-MtrCS-Produced Water - Vertical Fixed Roof Tank
Wellsburg, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Produced Water	133.62	0.00	133.62
Gasoline (RVP 15.0)	69.75	0.00	69.75

Produced Water

Tank Dimensions	Per Tank gal	Per Tank bbl	Two (2) Tanks gal	Two (2) Tanks bbl
Capacity	16,800	**400**	33,600	800
Daily T-Put	1,726	41.10	3,452	82
Annual T-Put	630,000	**15,000**	1,260,000	30,000

VOC Emissions	Per Tank lb/yr	Per Tank tpy	Two (2) Tanks lb/yr	Two (2) Tanks tpy
Working	**69.75**	0.03	139.50	0.07
Breathing	**---**	---	---	---
Total	**69.75**	0.03	139.50	0.07

GRI-GLYCalc VERSION 4.0 - EMISSIONS SUMMARY

Case Name: Pioneer CS - 125 MMscfd w/Electric Pump
File Name: C:\Users\clyde\Documents\Documents\04.16 - Ecologic\07 - AMS - Pioneer CS\10.835-Pioneer CS-45CSR13 App-032020\00-AMS-Pioneer CS-45CSR13-Sup4 125 DHY-Elect-040120-wk.ddf
Date: April 01, 2020

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0081	0.194	0.0355
Ethane	0.0305	0.731	0.1335
Propane	0.0453	1.087	0.1983
Isobutane	0.0100	0.239	0.0436
n-Butane	0.0441	1.058	0.1931
Isopentane	0.0098	0.236	0.0430
n-Pentane	0.0206	0.494	0.0901
n-Hexane	0.0149	0.358	0.0654
Cyclohexane	0.0087	0.209	0.0382
Other Hexanes	0.0098	0.235	0.0430
Heptanes	0.0208	0.500	0.0912
Methylcyclohexane	0.0125	0.299	0.0546
2,2,4-Trimethylpentane	0.0002	0.004	0.0007
Benzene	0.0129	0.309	0.0564
Toluene	0.0291	0.698	0.1274
Ethylbenzene	0.0030	0.071	0.0130
Xylenes	0.0762	1.829	0.3337
C8+ Heavies	0.0189	0.453	0.0827
Total Emissions	0.3752	9.004	1.6433
Total Hydrocarbon Emissions	0.3752	9.004	1.6433
Total VOC Emissions	0.3366	8.079	1.4743
Total HAP Emissions	0.1362	3.269	0.5966
Total BTEX Emissions	0.1211	2.907	0.5306

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	1.6199	38.877	7.0951
Ethane	6.0956	146.295	26.6989
Propane	9.0550	217.320	39.6610
Isobutane	1.9902	47.764	8.7169
n-Butane	8.8178	211.626	38.6218
Isopentane	1.9641	47.138	8.6027
n-Pentane	4.1136	98.726	18.0176
n-Hexane	2.9848	71.634	13.0732
Cyclohexane	1.7424	41.817	7.6317
Other Hexanes	1.9620	47.089	8.5937
Heptanes	4.1630	99.912	18.2340
Methylcyclohexane	2.4936	59.846	10.9219
2,2,4-Trimethylpentane	0.0332	0.797	0.1454
Benzene	2.5731	61.755	11.2703
Toluene	5.8196	139.670	25.4897
Ethylbenzene	0.5948	14.274	2.6051
Xylenes	15.2388	365.731	66.7459
C8+ Heavies	3.7758	90.620	16.5382

Total Emissions	75.0372	1800.893	328.6630
Total Hydrocarbon Emissions	75.0372	1800.893	328.6630
Total VOC Emissions	67.3217	1615.721	294.8691
Total HAP Emissions	27.2442	653.861	119.3297
Total BTEX Emissions	24.2263	581.430	106.1110

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.1418	3.404	0.6212
Ethane	0.1416	3.399	0.6204
Propane	0.0960	2.303	0.4204
Isobutane	0.0134	0.321	0.0585
n-Butane	0.0443	1.062	0.1939
Isopentane	0.0083	0.200	0.0364
n-Pentane	0.0137	0.328	0.0599
n-Hexane	0.0052	0.126	0.0230
Cyclohexane	0.0007	0.018	0.0033
Other Hexanes	0.0046	0.111	0.0203
Heptanes	0.0034	0.081	0.0148
Methylcyclohexane	0.0008	0.019	0.0035
2,2,4-Trimethylpentane	0.0001	0.001	0.0002
Benzene	0.0001	0.003	0.0006
Toluene	0.0002	0.005	0.0009
Ethylbenzene	<0.0001	<0.001	<0.0001
Xylenes	0.0002	0.005	0.0009
C8+ Heavies	0.0003	0.006	0.0012
Total Emissions	0.4747	11.393	2.0793
Total Hydrocarbon Emissions	0.4747	11.393	2.0793
Total VOC Emissions	0.1913	4.591	0.8378
Total HAP Emissions	0.0059	0.141	0.0256
Total BTEX Emissions	0.0006	0.013	0.0024

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	28.3635	680.725	124.2323
Ethane	28.3265	679.836	124.0700
Propane	19.1945	460.668	84.0719
Isobutane	2.6716	64.119	11.7017
n-Butane	8.8536	212.486	38.7786
Isopentane	1.6628	39.907	7.2830
n-Pentane	2.7356	65.655	11.9820
n-Hexane	1.0495	25.188	4.5968
Cyclohexane	0.1497	3.594	0.6558
Other Hexanes	0.9248	22.194	4.0505
Heptanes	0.6771	16.250	2.9656
Methylcyclohexane	0.1617	3.880	0.7081
2,2,4-Trimethylpentane	0.0110	0.265	0.0484
Benzene	0.0288	0.692	0.1263
Toluene	0.0400	0.960	0.1751
Ethylbenzene	0.0023	0.054	0.0099
Xylenes	0.0394	0.945	0.1725
C8+ Heavies	0.0534	1.281	0.2338

Total Emissions	94.9458	2278.699	415.8625
Total Hydrocarbon Emissions	94.9458	2278.699	415.8625
Total VOC Emissions	38.2558	918.138	167.5602
Total HAP Emissions	1.1710	28.104	5.1290
Total BTEX Emissions	0.1105	2.651	0.4839

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.1499	3.598	0.6566
Ethane	0.1721	4.131	0.7538
Propane	0.1412	3.390	0.6187
Isobutane	0.0233	0.559	0.1021
n-Butane	0.0884	2.121	0.3870
Isopentane	0.0181	0.435	0.0794
n-Pentane	0.0342	0.822	0.1500
n-Hexane	0.0202	0.484	0.0883
Cyclohexane	0.0095	0.227	0.0414
Other Hexanes	0.0144	0.346	0.0632
Heptanes	0.0242	0.581	0.1060
Methylcyclohexane	0.0133	0.319	0.0582
2,2,4-Trimethylpentane	0.0002	0.005	0.0010
Benzene	0.0130	0.312	0.0570
Toluene	0.0293	0.703	0.1283
Ethylbenzene	0.0030	0.072	0.0131
Xylenes	0.0764	1.833	0.3346
C8+ Heavies	0.0191	0.460	0.0839
Total Emissions	0.8499	20.398	3.7226
Total Hydrocarbon Emissions	0.8499	20.398	3.7226
Total VOC Emissions	0.5279	12.669	2.3121
Total HAP Emissions	0.1421	3.410	0.6223
Total BTEX Emissions	0.1217	2.920	0.5330

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Pioneer CS - 125 MMscfd w/Electric Pump
File Name: C:\Users\clyde\Documents\Documents\04.16 - Ecologic\07 - AMS - Pioneer CS\10.835-Pioneer CS-45CSR13 App-032020\00-AMS-Pioneer CS-45CSR13-Sup4 125 DHY-Elect-040120-wk.ddf
Date: April 01, 2020

DESCRIPTION:

Description: 125 MMscfd, 80 oF, 1,000 psig;
Elect Pump, 20 gpm
Flash Tank, 110 oF, 60 psig;
99.5% Thermal Oxidizer

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	0.0951
Nitrogen	0.5095
Methane	72.7016
Ethane	16.1959
Propane	6.5622
Isobutane	0.6514
n-Butane	1.8900
Isopentane	0.3456
n-Pentane	0.5068
n-Hexane	0.1742
Cyclohexane	0.0174
Other Hexanes	0.1602
Heptanes	0.1090
Methylcyclohexane	0.0215
2,2,4-Trimethylpentane	0.0022
Benzene	0.0026
Toluene	0.0039
Ethylbenzene	0.0003
Xylenes	0.0056
C8+ Heavies	0.0449

DRY GAS:

Flow Rate: 125.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 20.0 gpm

PUMP:

Glycol Pump Type: Electric/Pneumatic

FLASH TANK:

Flash Control:	Combustion device
Flash Control Efficiency:	99.50 %
Temperature:	110.0 deg. F
Pressure:	60.0 psig

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device:	Combustion Device
Destruction Efficiency:	99.5 %
Excess Oxygen:	5.0 %
Ambient Air Temperature:	50.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Pioneer CS - 125 MMscfd w/Electric Pump
File Name: C:\Users\clyde\Documents\Documents\04.16 - Ecologic\07 - AMS - Pioneer CS\10.835-Pioneer CS-45CSR13 App-032020\00-AMS-Pioneer CS-45CSR13-Sup4 125 DHY-Elect-040120-wk.ddf
Date: April 01, 2020

DESCRIPTION:

Description: 125 MMscfd, 80 oF, 1,000 psig;
Elect Pump, 20 gpm
Flash Tank, 110 oF, 60 psig;
99.5% Thermal Oxidizer

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0081	0.194	0.0355
Ethane	0.0305	0.731	0.1335
Propane	0.0453	1.087	0.1983
Isobutane	0.0100	0.239	0.0436
n-Butane	0.0441	1.058	0.1931
Isopentane	0.0098	0.236	0.0430
n-Pentane	0.0206	0.494	0.0901
n-Hexane	0.0149	0.358	0.0654
Cyclohexane	0.0087	0.209	0.0382
Other Hexanes	0.0098	0.235	0.0430
Heptanes	0.0208	0.500	0.0912
Methylcyclohexane	0.0125	0.299	0.0546
2,2,4-Trimethylpentane	0.0002	0.004	0.0007
Benzene	0.0129	0.309	0.0564
Toluene	0.0291	0.698	0.1274
Ethylbenzene	0.0030	0.071	0.0130
Xylenes	0.0762	1.829	0.3337
C8+ Heavies	0.0189	0.453	0.0827
Total Emissions	0.3752	9.004	1.6433
Total Hydrocarbon Emissions	0.3752	9.004	1.6433
Total VOC Emissions	0.3366	8.079	1.4743
Total HAP Emissions	0.1362	3.269	0.5966
Total BTEX Emissions	0.1211	2.907	0.5306

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	1.6199	38.877	7.0951
Ethane	6.0956	146.295	26.6989
Propane	9.0550	217.320	39.6610
Isobutane	1.9902	47.764	8.7169
n-Butane	8.8178	211.626	38.6218
Isopentane	1.9641	47.138	8.6027

n-Pentane	4.1136	98.726	18.0176
n-Hexane	2.9848	71.634	13.0732
Cyclohexane	1.7424	41.817	7.6317
Other Hexanes	1.9620	47.089	8.5937
Heptanes	4.1630	99.912	18.2340
Methylcyclohexane	2.4936	59.846	10.9219
2,2,4-Trimethylpentane	0.0332	0.797	0.1454
Benzene	2.5731	61.755	11.2703
Toluene	5.8196	139.670	25.4897
Ethylbenzene	0.5948	14.274	2.6051
Xylenes	15.2388	365.731	66.7459
C8+ Heavies	3.7758	90.620	16.5382
Total Emissions	75.0372	1800.893	328.6630
Total Hydrocarbon Emissions	75.0372	1800.893	328.6630
Total VOC Emissions	67.3217	1615.721	294.8691
Total HAP Emissions	27.2442	653.861	119.3297
Total BTEX Emissions	24.2263	581.430	106.1110

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.1418	3.404	0.6212
Ethane	0.1416	3.399	0.6204
Propane	0.0960	2.303	0.4204
Isobutane	0.0134	0.321	0.0585
n-Butane	0.0443	1.062	0.1939
Isopentane	0.0083	0.200	0.0364
n-Pentane	0.0137	0.328	0.0599
n-Hexane	0.0052	0.126	0.0230
Cyclohexane	0.0007	0.018	0.0033
Other Hexanes	0.0046	0.111	0.0203
Heptanes	0.0034	0.081	0.0148
Methylcyclohexane	0.0008	0.019	0.0035
2,2,4-Trimethylpentane	0.0001	0.001	0.0002
Benzene	0.0001	0.003	0.0006
Toluene	0.0002	0.005	0.0009
Ethylbenzene	<0.0001	<0.001	<0.0001
Xylenes	0.0002	0.005	0.0009
C8+ Heavies	0.0003	0.006	0.0012
Total Emissions	0.4747	11.393	2.0793
Total Hydrocarbon Emissions	0.4747	11.393	2.0793
Total VOC Emissions	0.1913	4.591	0.8378
Total HAP Emissions	0.0059	0.141	0.0256
Total BTEX Emissions	0.0006	0.013	0.0024

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	28.3635	680.725	124.2323
Ethane	28.3265	679.836	124.0700
Propane	19.1945	460.668	84.0719
Isobutane	2.6716	64.119	11.7017
n-Butane	8.8536	212.486	38.7786
Isopentane	1.6628	39.907	7.2830

n-Pentane	2.7356	65.655	11.9820
n-Hexane	1.0495	25.188	4.5968
Cyclohexane	0.1497	3.594	0.6558
Other Hexanes	0.9248	22.194	4.0505
Heptanes	0.6771	16.250	2.9656
Methylcyclohexane	0.1617	3.880	0.7081
2,2,4-Trimethylpentane	0.0110	0.265	0.0484
Benzene	0.0288	0.692	0.1263
Toluene	0.0400	0.960	0.1751
Ethylbenzene	0.0023	0.054	0.0099
Xylenes	0.0394	0.945	0.1725
C8+ Heavies	0.0534	1.281	0.2338
Total Emissions	94.9458	2278.699	415.8625
Total Hydrocarbon Emissions	94.9458	2278.699	415.8625
Total VOC Emissions	38.2558	918.138	167.5602
Total HAP Emissions	1.1710	28.104	5.1290
Total BTEX Emissions	0.1105	2.651	0.4839

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.1499	3.598	0.6566
Ethane	0.1721	4.131	0.7538
Propane	0.1412	3.390	0.6187
Isobutane	0.0233	0.559	0.1021
n-Butane	0.0884	2.121	0.3870
Isopentane	0.0181	0.435	0.0794
n-Pentane	0.0342	0.822	0.1500
n-Hexane	0.0202	0.484	0.0883
Cyclohexane	0.0095	0.227	0.0414
Other Hexanes	0.0144	0.346	0.0632
Heptanes	0.0242	0.581	0.1060
Methylcyclohexane	0.0133	0.319	0.0582
2,2,4-Trimethylpentane	0.0002	0.005	0.0010
Benzene	0.0130	0.312	0.0570
Toluene	0.0293	0.703	0.1283
Ethylbenzene	0.0030	0.072	0.0131
Xylenes	0.0764	1.833	0.3346
C8+ Heavies	0.0191	0.460	0.0839
Total Emissions	0.8499	20.398	3.7226
Total Hydrocarbon Emissions	0.8499	20.398	3.7226
Total VOC Emissions	0.5279	12.669	2.3121
Total HAP Emissions	0.1421	3.410	0.6223
Total BTEX Emissions	0.1217	2.920	0.5330

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction
Methane	131.3274	0.6566	99.50
Ethane	150.7689	0.7538	99.50
Propane	123.7329	0.6187	99.50
Isobutane	20.4186	0.1021	99.50

n-Butane	77.4005	0.3870	99.50
Isopentane	15.8857	0.0794	99.50
n-Pentane	29.9996	0.1500	99.50
n-Hexane	17.6700	0.0883	99.50
Cyclohexane	8.2875	0.0414	99.50
Other Hexanes	12.6442	0.0632	99.50
Heptanes	21.1996	0.1060	99.50
Methylcyclohexane	11.6300	0.0582	99.50
2,2,4-Trimethylpentane	0.1938	0.0010	99.50
Benzene	11.3966	0.0570	99.50
Toluene	25.6649	0.1283	99.50
Ethylbenzene	2.6149	0.0131	99.50
Xylenes	66.9184	0.3346	99.50
C8+ Heavies	16.7720	0.0839	99.50
Total Emissions	744.5256	3.7226	99.50
Total Hydrocarbon Emissions	744.5256	3.7226	99.50
Total VOC Emissions	462.4293	2.3121	99.50
Total HAP Emissions	124.4586	0.6223	99.50
Total BTEX Emissions	106.5949	0.5330	99.50

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature: 50.00 deg. F
Excess Oxygen: 5.00 %
Combustion Efficiency: 99.50 %
Supplemental Fuel Requirement: 3.74e-001 MM BTU/hr

Component	Emitted	Destroyed
Methane	0.50%	99.50%
Ethane	0.50%	99.50%
Propane	0.50%	99.50%
Isobutane	0.50%	99.50%
n-Butane	0.50%	99.50%
Isopentane	0.50%	99.50%
n-Pentane	0.50%	99.50%
n-Hexane	0.50%	99.50%
Cyclohexane	0.50%	99.50%
Other Hexanes	0.50%	99.50%
Heptanes	0.50%	99.50%
Methylcyclohexane	0.50%	99.50%
2,2,4-Trimethylpentane	0.50%	99.50%
Benzene	0.50%	99.50%
Toluene	0.50%	99.50%
Ethylbenzene	0.50%	99.50%
Xylenes	0.50%	99.50%
C8+ Heavies	0.50%	99.50%

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:	1.42	lbs. H2O/MMSCF
Temperature:	80.0	deg. F
Pressure:	1000.0	psig
Dry Gas Flow Rate:	125.0000	MMSCF/day
Glycol Losses with Dry Gas:	2.2756	lb/hr
Wet Gas Water Content:	Saturated	
Calculated Wet Gas Water Content:	32.39	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	7.44	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	4.38%	95.62%
Carbon Dioxide	99.74%	0.26%
Nitrogen	99.98%	0.02%
Methane	99.98%	0.02%
Ethane	99.95%	0.05%
Propane	99.93%	0.07%
Isobutane	99.91%	0.09%
n-Butane	99.88%	0.12%
Isopentane	99.89%	0.11%
n-Pentane	99.86%	0.14%
n-Hexane	99.80%	0.20%
Cyclohexane	99.06%	0.94%
Other Hexanes	99.85%	0.15%
Heptanes	99.68%	0.32%
Methylcyclohexane	99.08%	0.92%
2,2,4-Trimethylpentane	99.87%	0.13%
Benzene	90.67%	9.33%
Toluene	88.12%	11.88%
Ethylbenzene	86.35%	13.65%
Xylenes	81.28%	18.72%
C8+ Heavies	99.64%	0.36%

FLASH TANK

Flash Control:	Combustion device	
Flash Control Efficiency:	99.50	%
Flash Temperature:	110.0	deg. F
Flash Pressure:	60.0	psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.98%	0.02%
Carbon Dioxide	43.33%	56.67%
Nitrogen	5.26%	94.74%
Methane	5.40%	94.60%
Ethane	17.71%	82.29%
Propane	32.05%	67.95%
Isobutane	42.69%	57.31%
n-Butane	49.90%	50.10%
Isopentane	54.38%	45.62%
n-Pentane	60.26%	39.74%

n-Hexane	74.11%	25.89%
Cyclohexane	92.34%	7.66%
Other Hexanes	68.28%	31.72%
Heptanes	86.08%	13.92%
Methylcyclohexane	94.15%	5.85%
2,2,4-Trimethylpentane	75.42%	24.58%
Benzene	98.95%	1.05%
Toluene	99.37%	0.63%
Ethylbenzene	99.66%	0.34%
Xylenes	99.78%	0.22%
C8+ Heavies	98.77%	1.23%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	51.12%	48.88%
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	0.92%	99.08%
n-Pentane	0.83%	99.17%
n-Hexane	0.67%	99.33%
Cyclohexane	3.46%	96.54%
Other Hexanes	1.46%	98.54%
Heptanes	0.58%	99.42%
Methylcyclohexane	4.25%	95.75%
2,2,4-Trimethylpentane	1.99%	98.01%
Benzene	5.05%	94.95%
Toluene	7.95%	92.05%
Ethylbenzene	10.45%	89.55%
Xylenes	12.96%	87.04%
C8+ Heavies	12.16%	87.84%

STREAM REPORTS:

WET GAS STREAM

Temperature: 80.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 5.21e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.82e-002	1.69e+002
Carbon Dioxide	9.50e-002	5.75e+002
Nitrogen	5.09e-001	1.96e+003

Methane	7.27e+001	1.60e+005
Ethane	1.62e+001	6.69e+004
Propane	6.56e+000	3.97e+004
Isobutane	6.51e-001	5.20e+003
n-Butane	1.89e+000	1.51e+004
Isopentane	3.45e-001	3.42e+003
n-Pentane	5.06e-001	5.02e+003
n-Hexane	1.74e-001	2.06e+003
Cyclohexane	1.74e-002	2.01e+002
Other Hexanes	1.60e-001	1.90e+003
Heptanes	1.09e-001	1.50e+003
Methylcyclohexane	2.15e-002	2.90e+002
2,2,4-Trimethylpentane	2.20e-003	3.45e+001
Benzene	2.60e-003	2.79e+001
Toluene	3.90e-003	4.93e+001
Ethylbenzene	3.00e-004	4.37e+000
Xylenes	5.60e-003	8.16e+001
C8+ Heavies	4.49e-002	1.05e+003
Total Components	100.00	3.05e+005

DRY GAS STREAM

Temperature: 80.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 5.21e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.99e-003	7.39e+000
Carbon Dioxide	9.49e-002	5.73e+002
Nitrogen	5.10e-001	1.96e+003
Methane	7.27e+001	1.60e+005
Ethane	1.62e+001	6.68e+004
Propane	6.56e+000	3.97e+004
Isobutane	6.51e-001	5.19e+003
n-Butane	1.89e+000	1.51e+004
Isopentane	3.45e-001	3.42e+003
n-Pentane	5.06e-001	5.01e+003
n-Hexane	1.74e-001	2.06e+003
Cyclohexane	1.72e-002	1.99e+002
Other Hexanes	1.60e-001	1.89e+003
Heptanes	1.09e-001	1.49e+003
Methylcyclohexane	2.13e-002	2.87e+002
2,2,4-Trimethylpentane	2.20e-003	3.45e+001
Benzene	2.36e-003	2.53e+001
Toluene	3.44e-003	4.35e+001
Ethylbenzene	2.59e-004	3.78e+000
Xylenes	4.55e-003	6.64e+001
C8+ Heavies	4.48e-002	1.05e+003
Total Components	100.00	3.05e+005

LEAN GLYCOL STREAM

Temperature: 80.00 deg. F
Flow Rate: 2.00e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	1.11e+004
Water	1.50e+000	1.69e+002
Carbon Dioxide	1.33e-012	1.50e-010
Nitrogen	4.03e-013	4.53e-011
Methane	8.95e-018	1.01e-015
Ethane	1.44e-007	1.62e-005
Propane	1.02e-008	1.15e-006
Isobutane	1.24e-009	1.40e-007
n-Butane	3.89e-009	4.38e-007
Isopentane	1.62e-004	1.82e-002
n-Pentane	3.06e-004	3.44e-002
n-Hexane	1.80e-004	2.03e-002
Cyclohexane	5.56e-004	6.25e-002
Other Hexanes	2.59e-004	2.92e-002
Heptanes	2.16e-004	2.43e-002
Methylcyclohexane	9.83e-004	1.11e-001
2,2,4-Trimethylpentane	5.99e-006	6.74e-004
Benzene	1.22e-003	1.37e-001
Toluene	4.47e-003	5.03e-001
Ethylbenzene	6.16e-004	6.94e-002
Xylenes	2.02e-002	2.27e+000
C8+ Heavies	4.65e-003	5.23e-001
Total Components	100.00	1.13e+004

RICH GLYCOL STREAM

Temperature: 80.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 2.07e+001 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.56e+001	1.11e+004
Water	2.85e+000	3.30e+002
Carbon Dioxide	1.29e-002	1.50e+000
Nitrogen	3.92e-003	4.54e-001
Methane	2.59e-001	3.00e+001
Ethane	2.97e-001	3.44e+001
Propane	2.44e-001	2.83e+001
Isobutane	4.02e-002	4.66e+000
n-Butane	1.53e-001	1.77e+001
Isopentane	3.15e-002	3.65e+000
n-Pentane	5.94e-002	6.88e+000
n-Hexane	3.50e-002	4.05e+000
Cyclohexane	1.69e-002	1.95e+000
Other Hexanes	2.52e-002	2.92e+000
Heptanes	4.20e-002	4.86e+000
Methylcyclohexane	2.39e-002	2.77e+000
2,2,4-Trimethylpentane	3.88e-004	4.49e-002
Benzene	2.36e-002	2.74e+000
Toluene	5.49e-002	6.36e+000
Ethylbenzene	5.75e-003	6.66e-001
Xylenes	1.51e-001	1.75e+001

C8+ Heavies	3.76e-002	4.35e+000
Total Components	100.00	1.16e+004

FLASH TANK OFF GAS STREAM

Temperature: 110.00 deg. F
Pressure: 74.70 psia
Flow Rate: 1.32e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.15e-001	7.18e-002
Carbon Dioxide	5.55e-001	8.50e-001
Nitrogen	4.42e-001	4.30e-001
Methane	5.08e+001	2.84e+001
Ethane	2.71e+001	2.83e+001
Propane	1.25e+001	1.92e+001
Isobutane	1.32e+000	2.67e+000
n-Butane	4.38e+000	8.85e+000
Isopentane	6.63e-001	1.66e+000
n-Pentane	1.09e+000	2.74e+000
n-Hexane	3.50e-001	1.05e+000
Cyclohexane	5.12e-002	1.50e-001
Other Hexanes	3.09e-001	9.25e-001
Heptanes	1.94e-001	6.77e-001
Methylcyclohexane	4.73e-002	1.62e-001
2,2,4-Trimethylpentane	2.78e-003	1.10e-002
Benzene	1.06e-002	2.88e-002
Toluene	1.25e-002	4.00e-002
Ethylbenzene	6.10e-004	2.25e-003
Xylenes	1.07e-002	3.94e-002
C8+ Heavies	9.01e-003	5.34e-002
Total Components	100.00	9.63e+001

FLASH TANK GLYCOL STREAM

Temperature: 110.00 deg. F
Flow Rate: 2.05e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.64e+001	1.11e+004
Water	2.87e+000	3.30e+002
Carbon Dioxide	5.66e-003	6.50e-001
Nitrogen	2.08e-004	2.39e-002
Methane	1.41e-002	1.62e+000
Ethane	5.30e-002	6.10e+000
Propane	7.88e-002	9.05e+000
Isobutane	1.73e-002	1.99e+000
n-Butane	7.67e-002	8.82e+000
Isopentane	1.73e-002	1.98e+000
n-Pentane	3.61e-002	4.15e+000
n-Hexane	2.62e-002	3.00e+000
Cyclohexane	1.57e-002	1.80e+000
Other Hexanes	1.73e-002	1.99e+000
Heptanes	3.64e-002	4.19e+000

Methylcyclohexane	2.27e-002	2.60e+000
2,2,4-Trimethylpentane	2.95e-004	3.39e-002
Benzene	2.36e-002	2.71e+000
Toluene	5.50e-002	6.32e+000
Ethylbenzene	5.78e-003	6.64e-001
Xylenes	1.52e-001	1.75e+001
C8+ Heavies	3.74e-002	4.30e+000
Total Components	100.00	1.15e+004

FLASH GAS EMISSIONS

Flow Rate: 6.06e+003 scfh
Control Method: Combustion Device
Control Efficiency: 99.50

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.05e+001	1.74e+002
Carbon Dioxide	3.92e+001	2.76e+002
Nitrogen	9.62e-002	4.30e-001
Methane	5.54e-002	1.42e-001
Ethane	2.95e-002	1.42e-001
Propane	1.36e-002	9.60e-002
Isobutane	1.44e-003	1.34e-002
n-Butane	4.77e-003	4.43e-002
Isopentane	7.22e-004	8.31e-003
n-Pentane	1.19e-003	1.37e-002
n-Hexane	3.82e-004	5.25e-003
Cyclohexane	5.57e-005	7.49e-004
Other Hexanes	3.36e-004	4.62e-003
Heptanes	2.12e-004	3.39e-003
Methylcyclohexane	5.16e-005	8.08e-004
2,2,4-Trimethylpentane	3.03e-006	5.52e-005
Benzene	1.16e-005	1.44e-004
Toluene	1.36e-005	2.00e-004
Ethylbenzene	6.64e-007	1.13e-005
Xylenes	1.16e-005	1.97e-004
C8+ Heavies	9.82e-006	2.67e-004
Total Components	100.00	4.51e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 3.86e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	8.81e+001	1.61e+002
Carbon Dioxide	1.45e-001	6.50e-001
Nitrogen	8.38e-003	2.39e-002
Methane	9.93e-001	1.62e+000
Ethane	1.99e+000	6.10e+000
Propane	2.02e+000	9.06e+000
Isobutane	3.37e-001	1.99e+000

n-Butane	1.49e+000	8.82e+000
Isopentane	2.68e-001	1.96e+000
n-Pentane	5.61e-001	4.11e+000
n-Hexane	3.41e-001	2.98e+000
Cyclohexane	2.04e-001	1.74e+000
Other Hexanes	2.24e-001	1.96e+000
Heptanes	4.08e-001	4.16e+000
Methylcyclohexane	2.50e-001	2.49e+000
2,2,4-Trimethylpentane	2.86e-003	3.32e-002
Benzene	3.24e-001	2.57e+000
Toluene	6.21e-001	5.82e+000
Ethylbenzene	5.51e-002	5.95e-001
Xylenes	1.41e+000	1.52e+001
C8+ Heavies	2.18e-001	3.78e+000
Total Components	100.00	2.37e+002

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 2.26e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	8.47e+000	8.10e-003
Ethane	1.70e+001	3.05e-002
Propane	1.72e+001	4.53e-002
Isobutane	2.87e+000	9.95e-003
n-Butane	1.27e+001	4.41e-002
Isopentane	2.28e+000	9.82e-003
n-Pentane	4.78e+000	2.06e-002
n-Hexane	2.91e+000	1.49e-002
Cyclohexane	1.74e+000	8.71e-003
Other Hexanes	1.91e+000	9.81e-003
Heptanes	3.49e+000	2.08e-002
Methylcyclohexane	2.13e+000	1.25e-002
2,2,4-Trimethylpentane	2.44e-002	1.66e-004
Benzene	2.76e+000	1.29e-002
Toluene	5.30e+000	2.91e-002
Ethylbenzene	4.70e-001	2.97e-003
Xylenes	1.20e+001	7.62e-002
C8+ Heavies	1.86e+000	1.89e-002
Total Components	100.00	3.75e-001

Supplement S7

45CSR13 Construction Permit

- **Pioneer Compressor Station Permit R13-3491B**

West Virginia Department of Environmental Protection

Harold D. Ward
Cabinet Secretary

Class II Administrative Update

R13-3491B

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§22-5-1 et seq.) and 45 CSR 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation. The permittee identified at the above-referenced facility is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

Appalachia Midstream Services, LLC
Pioneer Compressor Station
069-00143

Laura M. Crowder
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Laura M. Crowder
Director, Division of Air Quality

Issued: June 1, 2022

This permit will supercede and replace Permit R13-3491A issued on March 18, 2021.

Facility Location:	Wheeling, Ohio County, West Virginia
Mailing Address:	100 Teletech Drive, Suite 2 Moundsville, WV 26041
Facility Description:	Natural Gas Compression and Dehydration Facility
NAICS Codes:	213112
UTM Coordinates:	534.794 km Easting • 4,443.746 km Northing • Zone 17T
Permit Type:	Class II Administrative Update
Description of Change:	Remove flare control device on compressor rod packing emissions.

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.

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As a result of the granting of this permit, the source is subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the date of the commencement of the operation or activity (activities) authorized by this permit, unless granted a deferral or exemption by the Director from such filing deadline pursuant to a request from the permittee.

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1.0. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
CE-01	1E	Compressor Engine 01 – CAT G3616LE A4	2017	5,350 bhp	OxCat
CE-02	2E	Compressor Engine 02 – CAT G3616LE A4	2017	5,350 bhp	OxCat
CE-03	3E	Compressor Engine 03 – CAT G3616LE A4	2017	5,350 bhp	OxCat
CE-04	4E	Compressor Engine 04 – CAT G3616LE A4	2017	5,350 bhp	OxCat
CRP	5E	Compressor Rod Packing (Comp-01 thru -05)	2017	5 compressors	None
CBD	6E	Compressor Blowdown (Comp-01 thru -05)	2017	-	FLR-01
STAB	25E	Condensate Stabilizer	2017	-	VRU-01 with FLR-01 back-up
DFT-01	7E	Dehydrator 01 – Flash Tank	2017	125 MMscfd	TO-01
DSV-01	8E	Dehydrator 01 -Still Vent	2017	125 MMscfd	TO-01
RBV-01	12E	Dehydrator 01 – Reboiler	2017	2.00 MMBtu/hr	-
DFT-02	9E	Dehydrator 02 – Flash Tank	2017	125 MMscfd	TO-01
DSV-02	10E	Dehydrator 02 -Still Vent	2017	125 MMscfd	TO-01
RBV-02	13E	Dehydrator 02 – Reboiler	2017	2.00 MMBtu/hr	-
TK-01	15E	Storage Tank 01 – Stabilized Condensate	2017	400 bbl	VRU-01
TK-02	16E	Storage Tank 02 – Stabilized Condensate	2017	400 bbl	VRU-01
TK-03	17E	Storage Tank 03 – Stabilized Condensate	2017	400 bbl	VRU-01
TK-04	18E	Storage Tank 04 – Stabilized Condensate	2017	400 bbl	VRU-01
TK-05	19E	Storage Tank 05 – Stabilized Condensate	2017	400 bbl	VRU-01
TK-06	20E	Storage Tank 06 – Stabilized Condensate	2017	400 bbl	VRU-01
TK-07	21E	Storage Tank 07 – Produced Water	2017	400 bbl	VRU-01
TK-08	22E	Storage Tank 08 – Produced Water	2017	400 bbl	VRU-01
TLO	23E	Truck Load-Out – Stabilized Condensate	2017	168,000 bbl/yr	VRU-01
TLO	23E	Truck Load-Out – Produced Water	2017	30,000 bbl/yr	VRU-01
PIG	24E	Pigging Operations (3 Receivers, 1 launcher)	2017	1,772 events/yr	FLR-01
TO-01	11E	DFT/DSV Thermal Oxidizer (Combustion Only)	2017	10.00 MMBtu/hr	-
FLR-01	14E	CBD/PIG/STAB Elevated Flare (Combustion Only)	2017	8.00 MMBtu/hr	-
VRU-01	-	TK/TLO Vapor Recovery Unit (VRU-01)	2017	-	-
ECC	3F	Engine Crankcase Emissions	-	-	-

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 such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments	**NO_X**	Nitrogen Oxides
CBI	Confidential Business Information	**NSPS**	New Source Performance Standards
CEM	Continuous Emission Monitor	**PM**	Particulate Matter
CES	Certified Emission Statement	**$PM_{2.5}$**	Particulate Matter less than 2.5 μm in diameter
CFR	Code of Federal Regulations		
CO	Carbon Monoxide	**PM_{10}**	Particulate Matter less than 10μm in diameter
CSR	Codes of State Rules		
DAQ	Division of Air Quality	**Ppb**	Pounds per Batch
DEP	Department of Environmental Protection	**Pph**	Pounds per Hour
		Ppm	Parts per Million
dscm	Dry Standard Cubic Meter	**Ppm_V or ppmv**	Parts per Million by Volume
FOIA	Freedom of Information Act		
HAP	Hazardous Air Pollutant	**PSD**	Prevention of Significant Deterioration
HON	Hazardous Organic NESHAP		
HP	Horsepower	**psi**	Pounds per Square Inch
lbs/hr	Pounds per Hour	**SIC**	Standard Industrial Classification
LDAR	Leak Detection and Repair		
M	Thousand	**SIP**	State Implementation Plan
MACT	Maximum Achievable Control Technology	**SO_2**	Sulfur Dioxide
		TAP	Toxic Air Pollutant
MDHI	Maximum Design Heat Input	**TPY**	Tons per Year
MM	Million	**TRS**	Total Reduced Sulfur
MMBtu/hr *or* mmbtu/hr	Million British Thermal Units per Hour	**TSP**	Total Suspended Particulate
		USEPA	United States Environmental Protection Agency
MMCF/hr *or* mmcf/hr	Million Cubic Feet per Hour		
		UTM	Universal Transverse Mercator
NA	Not Applicable	**VEE**	Visual Emissions Evaluation
NAAQS	National Ambient Air Quality Standards	**VOC**	Volatile Organic Compounds
		VOL	Volatile Organic Liquids
NESHAPS	National Emissions Standards for Hazardous Air Pollutants		

2.3. Authority

This permit is issued in accordance with West Virginia Air Pollution Control Act W.Va. Code §§ 22-5-1. et seq. and the following Legislative Rules promulgated thereunder:

2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation*;

2.4. Term and Renewal

2.4.1. This permit will supercede and replace Permit R13-3491A issued on March 18, 2021. This Permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any other applicable legislative rule;

2.5. Duty to Comply

2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Applications R13-3491 – R13-3491B and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.10 and 10.3.]

2.5.2. 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;

2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;

2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses, and/or approvals from other agencies; i.e., local, state, and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

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 administratively updating, modifying, revoking, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records 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 CFR Part 2.

2.7. Duty to Supplement and Correct Information

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.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-4.]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-5.4.]

2.10 Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.
[45CSR§13-5.1]

2.11. Inspection and Entry

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; and

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.

2.12. Emergency

2.12.1. An "emergency" means any situation arising from sudden and reasonable unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

2.12.2. Effect of any emergency. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of Section 2.12.3 are met.

2.12.3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An emergency occurred and that the permittee can identify the cause(s) of the emergency;

b. The permitted facility was at the time being properly operated;

c. During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and

d. The permittee submitted notice of the emergency to the Secretary within one (1) working day of the time when emission limitations were exceeded due to the emergency and made a request for variance, and as applicable rules provide. This notice must contain a detailed description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.

2.12.4. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.

2.12.5 The provisions of this section are in addition to any emergency or upset provision contained in any applicable requirement.

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should 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.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13. **[45CSR§13-10.1.]**

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

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 defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

3.0. Facility-Wide Requirements

3.1. Limitations and Standards

3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency 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, suffer, allow or permit 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 CFR § 61.145, 40 CFR § 61.148, and 40 CFR § 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 CFR § 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.
[40CFR§61.145(b) and 45CSR§34]

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. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]

3.1.6. **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.]

3.2. Monitoring Requirements

[Reserved]

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 CFR Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as 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 may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 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 sixty (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; and,
    3. A statement of compliance or noncompliance with each permit or rule condition.

[WV Code § 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports, and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for

continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

3.4.2. **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§4. *State Enforceable Only.*]

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.

3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.

3.5.3. **Correspondence.** 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 email 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
Charleston, WV 25304-2345

US EPA:
Section Chief, USEPA, Region III
Enforcement and Compliance Assurance Division
Air Section (3ED21)
Four Penn Center
1600 John F Kennedy Blvd
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. **Operating Fee**

3.5.4.1. In accordance with 45CSR30 – Operating Permit Program, the permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.

3.5.4.2. In accordance with 45CSR30 – Operating Permit Program, enclosed with this permit is a Certified Emissions Statement (CES) Invoice, from the date of initial startup through the following June 30. Said invoice and the appropriate fee shall be submitted to this office no later than 30 days prior to the date of initial startup. For any startup date other than July 1, the permittee shall pay a fee or prorated fee in accordance with Section 4.5 of 45CSR22. A copy of this schedule may be found attached to the Certified Emissions Statement (CES) Invoice.

3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. **Minor Source of Hazardous Air Pollutants (HAP).** HAP emissions from the facility shall be less than 10 tons/year of any single HAP or 25 tons/year of any combination of HAPs. Compliance with this Section shall ensure that the facility is a minor HAP source.

4.1.2. **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.
[45CSR§13-5.10.]

4.1.3. 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.

4.2. Monitoring Requirements

[Reserved]

4.3. Testing Requirements

[Reserved]

4.4. Recordkeeping Requirements

4.4.1. **Record of Monitoring.** 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.

4.4.2. **Record of Maintenance of Air Pollution Control Equipment.** For all pollution control equipment listed in Section 1.0, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

4.4.3. **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.

4.5. Reporting Requirements

[Reserved]

5.0. Source-Specific Requirements (Compressor Engines, CE-01 to CE-04, OxCat (01-04))

5.1. Limitations and Standards

5.1.1. Maximum emissions from each of the 5,350 bhp natural gas fired reciprocating engines equipped with oxidation catalysts, Caterpillar G3616 (CE-01 – CE-04) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	4.72	20.66
Carbon Monoxide	2.48	10.87
Volatile Organic Compounds (includes formaldehyde)	4.31	18.87
Formaldehyde	0.42	1.86

5.1.2. Requirements for Use of Catalytic Reduction Devices (OxCat (01-04))

a. Lean-burn natural gas engine(s) equipped with oxidation catalyst air pollution control devices shall be fitted with a closed-loop automatic air/fuel ratio feedback controller to ensure emissions of regulated pollutants do not exceed permit requirement 5.1.1 for any engine/oxidation catalyst combination under varying load. The closed-loop, automatic air/fuel ratio controller shall control a fuel metering valve to ensure a lean-rich mixture;

b. 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.

c. The permittee shall follow a written operation and maintenance plan that provides the periodic and annual maintenance requirements.
[45CSR§13-5.10.]

5.2. Monitoring Requirements

5.2.1. Catalytic Oxidizer Control Devices (OxCat (01-04))

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/fuel ratio controller or automatic feedback controller.

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

[45CSR§13-5.10.]

5.3. Testing Requirements

5.3.1. To demonstrate compliance with permit condition 5.1.1, the permittee shall perform emissions testing required under section 11.4.
[45CSR§13-5.10.]

5.3.2. See Facility-Wide Testing Requirements Section 3.3 and Testing Requirements of Section 11.4.
[45CSR§13-5.10.]

5.4. Recordkeeping Requirements

5.4.1. To demonstrate compliance with permit condition 5.1.2., the permittee shall maintain records of maintenance performed on each engine.

5.4.2. To demonstrate compliance with permit condition 5.2.1, the permittee shall maintain records of all catalytic reduction device maintenance.

5.4.3. The permittee shall maintain a copy of the site specific maintenance plan or manufacturer maintenance plan.

5.4.4. All records required by this section shall be maintained in accordance with section 3.5.1 of this general permit.

5.5. Reporting Requirements

5.5.1. See Facility-Wide Reporting Requirements Section 3.5 and reporting requirements of section 11.5.

6.0. Source-Specific Hazardous Air Pollutant Requirements (Natural Gas Dehydration Unit DFT-01/DSV01 and DFT02/DSV02 Standards and being controlled by a Thermal Oxidizer TO-01)

6.1. Limitations and Standards

6.1.1. Maximum Throughput Limitation. The maximum dry natural gas throughput to each of the glycol dehydration units/still columns (DFT-01, DSV-01, DFT-02, DSV-02) shall not exceed 125.0 million standard cubic feet per day (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.

6.1.2. The permittee shall install a 10.0 MMBTU/hr thermal oxidizer to control VOC and HAP emissions from the glycol dehydration units/still vents and dehydrator flash tanks. This thermal oxidizer shall be designed to achieve a minimum guaranteed control efficiency of 99.5% for volatile organic compounds (VOC) and hazardous air pollutants (HAP) emissions.

6.1.3. The Thermal Oxidizer (TO-01) shall be designed and operated in accordance with the following:

a. The vapors/overheads from the still vents (DSV-01, DSV-02) and flash tanks (DFT-01, DFT-02) shall be routed to the thermal oxidizer at all times;

b. The thermal oxidizer shall be operated, with a flame present at all times as determined by the methods specified in permit condition 6.2.1;

c. The thermal oxidizer shall be operated according to the manufacturer's specifications for residence time and minimum combustion chamber temperature;

d. The thermal oxidizer shall be operated at all times when emissions/overheads from the glycol dehydration unit still vents and flash tanks may be vented to it;

e. The thermal oxidizer shall be designed for and operated with no visible emissions as determined by the methods specified in permit condition 6.3.1, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours;

f. The thermal oxidizer (TO-01) is subject to the applicable requirements of 45CSR6.

[45CSR§13-5.10.]

6.1.4. Emissions from the thermal oxidizer shall not exceed the following maximum hourly and annual emission limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	0.98	4.29
Carbon Monoxide	3.10	13.58
Volatile Organic Compounds	1.31	5.80
Total HAPs	0.42	1.76

6.1.5. Any source that determines it is not a major source but has actual emissions of 5 tons per year or more of a single HAP, or 12.5 tons per year or more of a combination of HAP (i.e., 50 percent of the major source thresholds), shall update its major source determination within 1 year of the prior determination or October 15, 2012, whichever is later, and each year thereafter, using gas composition data measured during the preceding 12 months.
[40CFR§63.760(c)]

6.1.6. The permittee is exempt from the requirements of 40CFR§63.760(b)(2) if the criteria below is met, except that the records of the determination of these criteria must be maintained as required in 40CFR§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 ton/yr), as determined by the procedures specified in §63.772(b)(2) of this subpart.

[40CFR§63.764(e)]

6.1.7 *Operation and Maintenance of Thermal Oxidizer (TO-01).* The permittee shall, to the extent practicable, install, maintain, and operate the thermal oxidizer 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.
[40CFR§63.764(j)]

6.2. Monitoring Requirements

6.2.1. To demonstrate compliance with the pilot flame requirements of permit condition 6.1.3.b and 6.1.3.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.

6.2.2. 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 (DSV-1, DSV-2).

6.3. Testing Requirements

6.3.1. In order to demonstrate compliance with the opacity requirements of permit condition 6.1.2.f 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 40CFR 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 CFR Part 60, Appendix A, Method 22 or from the lecture portion of 40 CFR part 60, appendix A, Method 9 certification course.

6.3.2. In order to demonstrate compliance with permit condition 6.1.4, 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.

6.3.3. Determination of glycol dehydration 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).
[§63.772 (b)(2)]

6.3.4. Use of the ProMax model, Version 5.0 or higher, as an alternative to the GLYCalc model is subject to the following caveats.

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:

- Wet gas flowrate
- Wet gas composition (dry basis)
- Wet gas water content (if unknown, can assume a worst-case of 100% saturation)
- Wet gas (absorber) temperature
- Wet gas (absorber) pressure
- Glycol circulation rate (or dry gas water content or glycol circulation ratio)
- Dry gas water content
- Lean glycol water content
- Gas pump volume ratio (when gas injection pump is used)
- Reboiler temperature
- Flash tank parameters (when installed)
    - Temperature
    - Pressure
- Control device parameters (when installed)
    - Combustion device destruction efficiency
    - Condenser temperature and pressure
- Stripping gas (if used)
    - Type (dry gas, flash gas, nitrogen)
    - Flowrate

6.3.5. Affected facilities using this alternative (ProMax as an alternative to GLYCalc under 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.

6.3.6. Once a facility chooses to use ProMax as an alternative to GLYCalc under one or more of the 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)).

6.4. Recordkeeping Requirements

6.4.1. The permittee shall maintain a record of the dry natural gas throughput for the glycol dehydration units/still columns (DSV-1, DSV-2) to demonstrate compliance with section 6.1.1 of this permit. Said records shall be maintained for a period of five (5) years on site or in a readily accessible off-site location maintained by the permittee. 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.

6.4.2. For the purpose of documenting compliance with the emission limitations, HAP major source thresholds, as well as the benzene exemption, the permittee shall maintain records of all monitoring data, wet gas sampling, and annual GRI-GLYCalc™ emission estimates. Said records shall be maintained for a period of five (5) years on site or in a readily accessible off-site location maintained by the permittee. 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.

6.4.3. The permittee shall maintain records of all monitoring data required by section 6.2.1 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.

[45CSR§13-5.10]

6.5. Reporting Requirements

6.5.1. If the permittee is required by the Director to demonstrate compliance with permit condition 6.3.3, 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.

6.5.2. Any deviation(s) of the allowable visible emission requirement for any emission source discovered during observations using 40CFR 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.

6.5.3. Any deviation(s) from the thermal oxidizer design and/or operation criteria in section 6.1.5 shall be reported in writing to the Director as soon as practicable, but within ten (10) calendar days.

7.0. Source-Specific Requirements (Reboilers (RBV-01 and RBV-02))

7.1. Limitations and Standards

7.1.1. Maximum Design Heat Input. The maximum design heat input for each of the Reboilers (RBV-01, RBV-02) shall not exceed 2.00 MMBTU/hr.

7.1.2. 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.
[45CSR§2-3.1.]

7.2. Monitoring Requirements

7.2.1. At such reasonable times as the Secretary may designate, the permittee shall conduct Method 9 emission observations for the purpose of demonstrating compliance with Section 7.1.2. Method 9 shall be conducted in accordance with 40 CFR 60 Appendix A.

7.3. Testing Requirements

7.3.1. Compliance with the visible emission requirements of section 7.1.2 shall be determined in accordance with 40 CFR 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 section 7.1.2. Continuous opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control.
[45CSR§2-3.2.]

7.4. Recordkeeping Requirements

7.4.1. The permittee shall maintain records of all monitoring data required by Section 7.2.1 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.

7.5. Reporting Requirements

7.5.1. Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40CFR 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.

8.0. Source-Specific Requirements (Condensate Storage Tanks (TK-01 – TK-06), Produced Water Storage Tank (TK-07 – TK-08))

8.1. Limitations and Standards

8.1.1. The permittee shall route all VOC and HAP emissions from the Condensate Storage Tanks (TK 01 – TK 06), and Produced Water Storage Tank (TK 07-TK 08) to the vapor recovery unit (VRU-01). The vapor recovery system shall be designed to achieve a minimum guaranteed control efficiency of 98% for volatile organic compound (VOC) and hazardous air pollutants (HAP) emissions. Emissions from the condensate storage tanks and produced water storage tanks will be collected and compressed by the VRU-01 whereby the vapors are sufficiently compressed to be introduced into the gas system to allow for compression and dehydration.

8.1.2. *Operation and Maintenance of Air Pollution Control Equipment.* The permittee shall, to the extent practicable, install, maintain, and operate VRU-01 with the flare backup unit 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. **[45CSR§13-5.10.]**

8.1.3. The maximum annual throughput of product to the storage tanks shall not exceed the following:

Storage Tank ID	Product Stored	Maximum Annual Throughput (gal/yr)
TK-01	Condensate	1,176,000
TK-02	Condensate	1,176,000
TK-03	Condensate	1,176,000
TK-04	Condensate	1,176,000
TK-05	Condensate	1,176,000
TK-06	Condensate	1,176,000
TK-07	Produced Water	630,000
TK-08	Produced Water	630,000

[45CSR§13-5.10]

8.2. Monitoring Requirements

8.2.1. The permittee shall monitor the throughput to the storage tanks (TK-01-TK-08) on a monthly basis.

8.2.2. To demonstrate compliance with permit condition 8.1.1, the permittee shall monitor VRU-01 in accordance with the plans and specifications and manufacturer's recommendations.

8.3. Recordkeeping Requirements

8.3.1. All records required under Section 8.3 shall be kept in accordance with permit condition 3.4.1.

8.3.2. *Record of Maintenance of VRU-01.* The permittee shall maintain accurate records of the VRU-01 equipment inspection and/or preventative maintenance procedures.

8.3.3. *Record of Malfunctions of VRU-01.* The permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the VRU-01 during which excess emissions occur. For each malfunction, the permittee shall record the information as required in in condition 4.14.

8.3.4. To demonstrate compliance with permit condition 8.1.3, the permittee shall maintain a record of the aggregate throughput for the storage tanks on a monthly and rolling twelve month total.

8.3.5. The permittee shall maintain a copy all design records of the process, maintenance records of equipment and any downtime hours associated with the VRU-01.

i. The initial compliance requirements;

ii. Each annual visual inspection conducted to demonstrate continuous compliance, including records of any repairs that were made as results of the inspection;

iii. Bypass requirements.

a. Each occurrence that the control device was bypassed. If the device was bypassed, the records shall include the date, time, and duration of the event and shall provide the reason the event occurred. The record shall also include the estimate of emissions that were released to the environment as a result of the bypass.

iv. Any part of the system that has been designated as "unsafe to inspect" or "difficult to inspect". **[45CSR§13-5.10]**

8.4. Reporting Requirements

8.4.1. Upon request by the Director, the permittee shall report deviations within a requested time from of any occurrences when the control device was operated outside of the parameters defined in the monitoring plan.

8.4.2. The permittee shall notify the Director of any downtime of the VRU-01 in excess of 2%, based on the 12 month rolling total, in writing to the Director of the Division of Air Quality as soon as practicable, but within ten (10) calendar days of the discovery and shall include, at a minimum, the following information: the dates and durations of each downtime event, the cause or suspected causes for each downtime event, any corrective measures taken or planned for each downtime event.

9.0. Source-Specific Requirements (Truck Loading, TLO)

9.1. Limitations and Standards

9.1.1. The permittee shall install, maintain, and operate all above-ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above-ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be replaced.

9.1.2. The maximum quantity of produced water from truck loading (TLO) that shall be loaded shall not exceed 1,260,000 gallons per year. 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.

9.1.3. The maximum quantity of condensate from truck loading (TLO) that shall be loaded shall not exceed 7,056,000 gallons per year. 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.

9.1.4. The Produced Water and Condensate Truck Loading (TLO) shall be operated using submerged filling and be controlled by a vapor recovery unit (VRU-1).

9.2. Monitoring Requirements

9.2.1. See Facility-Wide Monitoring Requirements Section 3.2.

9.3. Recordkeeping Requirements

9.3.1. All records required under Section 9.3 shall be kept in accordance with permit condition 3.4.1.

9.3.2. To demonstrate compliance with permit conditions 9.1.2 and 9.1.3, the permittee shall maintain a record of the aggregate throughput for the truck loading (TLO) on a monthly and rolling twelve month total.

9.4. Reporting Requirements

9.4.1. See Facility-Wide Reporting Requirements Section 3.5.

10.0. Source-Specific Hazardous Air Pollutant Requirements (CBD, PIG, and STAB controlled by Elevated Flare, FLR-01)

10.1 Limitations and Standards

10.1.1 The maximum number of compressor blowdown (CBD) events per year shall not exceed 422 events, with an estimated 54,732 scf per event. 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.

10.1.2. The maximum number of pigging (PIG) events per year shall not exceed 1,042 low pressure events, with an estimated 3,823 scf per event and 730 high pressure events, with an estimated 8,064 scf/event. Compliance shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the low pressure and high pressure pigging events at any given time during the previous twelve consecutive calendar months.

10.1.3 The maximum number of plant shutdown events per year shall not exceed 1 event, with an estimated 967,000 scf per event. Compliance shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the plant shut downs at any given time during the previous twelve consecutive calendar months. Unscheduled emergency shutdowns shall not be counted as plant shutdown events.

10.1.4. The waste gas from the compressor blowdowns, CBD, and pigging, PIG, shall be controlled at all times by the elevated flare, FLR-01. The flare shall have a design capacity of 8.0 MMBtu/hr. This flare shall be designed to achieve a minimum guaranteed control efficiency of 98% for volatile organic compound (VOC) and hazardous air pollutants (HAP) emissions

10.1.5. Maximum emissions from the elevated flare (FLR-01) shall not exceed the following limits:

Pollutant	**Maximum Annual Emissions (ton/year)**
Nitrogen Oxides	3.44
Carbon Monoxide	10.86
Volatile Organic Compounds	6.18

10.1.6. *Operation and Maintenance of Flare (FLR-01).* The permittee shall, to the extent practicable, install, maintain, and operate the flare 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.
[45CSR§13-5.10.]

10.1.7 The quantity of waste gas that shall be consumed in the flare shall not exceed 50.19 MMscf per year. Compliance with the gas throughput limit shall be demonstrated using a rolling 12-month total.
[45CSR§13-5.10.]

10.1.8. The flare (FLR-01) is subject to the opacity requirements in 45CSR6.

10.1.9. The flare (FLR-01) shall be operated with a pilot flame present at all times whenever emissions may be vented.
[45CSR§13-5.10.]

10.1.10. The flare (FLR-01) installed shall be operated and designed in accordance with the information filed in permit application R13-3491.
[45CSR§13-5.10.]

10.1.11. The permittee shall comply with the requirements of Section 2.12 of this permit during emergency operation of the flare (FLR-01).
[45CSR§13-5.10.]

10.1.12. The permittee shall route the stabilization overheads to VRU-01 at all times except for 120 hours per year for stabilizer overheads compressor downtime associated with planned preventative maintenance. During this planned compressor maintenance, the permittee shall direct the stabilization overheads to flare FLR-01.
[45CSR§13-5.10.]

10.2. Monitoring Requirements

10.2.1. In order to demonstrate compliance with the requirements of permit condition 10.1.9., the permittee shall monitor the presence or absence of a flare pilot flame using a thermocouple or any other equivalent device.

10.2.2. In order to demonstrate compliance with the requirements of 10.1.7, the permittee shall monitor the throughput to the flare (FLR-01) on a monthly basis.

10.3. Testing Requirements

10.3.1. At such reasonable times as the Secretary may designate, the permittee shall conduct Method 9 emission observations for the purpose of demonstrating compliance with Section 10.1.8. Method 9 shall be conducted in accordance with 40 CFR 60 Appendix A.

10.4. Recordkeeping Requirements

10.4.1. All records required under section 10.4 of this permit shall be kept in accordance with permit condition 3.4.1.

10.4.2. To demonstrate compliance with permit condition 10.1.1 of this permit, the permittee shall maintain a record of the compressor blowdown events and estimated volume per event (scf) on a monthly and rolling twelve month total.

10.4.3. To demonstrate compliance with permit condition 10.1.2 of this permit, the permittee shall maintain a record of the low pressure and high pressure pigging events and estimated volume per event (scf) on a monthly and rolling twelve month total.

10.4.4. To demonstrate compliance with permit condition 10.1.3 of this permit, the permittee shall maintain a record of the shutdown events and estimated volume per event (scf) on a monthly and rolling twelve month total.

10.4.5. For the purpose of demonstrating compliance with section 10.1.9 and 10.2.1, the permittee shall maintain records of the times and duration of all periods which the pilot flame was absent.

10.4.6. For the purpose of demonstrating compliance with the requirements set forth in section 10.1.8 the permittee shall maintain records of testing conducted in accordance with 10.3.1.

10.4.7. The permittee shall document and maintain the corresponding records specified by the on-going monitoring requirements of section 10.2 and testing requirements of section 10.3.

10.4.8. The permittee shall document and maintain records of the stabilizer overheads compressor downtime associated with planned preventative maintenance specifically the hours that the stabilization overheads are routed to the flare FLR-01 to demonstrate compliance with 10.1.12.

10.5. Reporting Requirements

10.5.1. If permittee is required by the Director to demonstrate compliance with section 10.3.1. The permittee shall submit the testing results within sixty (60) days of testing and provide all supporting calculations and testing data.

10.5.2. Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 or 22 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.

10.5.3. Any deviation(s) from the flare design and operation criteria in Section 10.1.10 and permit application R13-3491, shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but no later than ten (10) calendar days of discovery of such deviation.

10.5.4. The permittee shall report to the Director, the time, cause of event, estimate of emissions and corrective actions taken when the flare was used for an emergency at the facility.

10.5.5. Any time the air pollution control device is not operating when emissions are vented to it shall be reported in writing to the Director of the DAQ as soon as practicable, but within (10) calendar days of the discovery.

11.0 Source-Specific Requirements (40CFR60 Subpart JJJJ Requirements (CE-01 – CE-04))

11.1. Limitations and Standards

11.1.1. The provisions of this subpart are applicable to stationary spark ignition (SI) internal combustion engines (ICE) (CE-01 – CE-04) as specified below. For the purposes of this subpart, 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 commence modification or reconstruction after June 12, 2006.

[40CFR§60.4230(a)]

11.1.2. Compressor engines CE-01 – CE-04 shall comply with the emission standards in Table 1 to this subpart.

[40CFR§60.4233(e)]

11.1.3. The permittee shall operate and maintain stationary compressor engines CE-01-CE-04 so that each engine achieves the emission standards as required in §60.4233 over the entire life of the engine. [**40CFR§60.4234]**

11.2. Other Requirements

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

[40CFR§60.4236(b)]

11.2.2. The requirements of this section 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.

[40CFR§60.4236(e)]

11.3. Compliance Requirements

11.3.1. The permittee shall comply with the emission standards specified in §60.4233(d) or (e). The permittee shall demonstrate compliance according to one of the methods specified in paragraphs (b)(1) and (2) of this section.

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

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

i. For stationary SI internal combustion engine 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.

[40CFR§60.4243(b)]

11.4. Testing Requirements

11.4.1. In order to demonstrate compliance with section 11.3.1.b.i., the permittee shall conduct performance tests following the procedures in paragraphs (a) through (f) of this section.

a. Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements in §60.8 and under the specific conditions that are specified by Table 2 to this subpart.
[40CFR§60.4244(a)]

b. The permittee may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in §60.8(c). If the permittee's 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.
[40CFR§60.4244(b)]

c. The permittee must conduct three separate test runs for each performance test required in this section, as specified in §60.8(f). Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least 1 hour. **[40CFR§60.4244(c)]**

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

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

Where:
ER = Emission rate of NO_X in g/HP-hr.

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

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

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

T = Time of test run, in hours.

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

[40CFR§60.4244(d)]

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

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

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

C_d= Measured CO concentration in ppmv.

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

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

T = Time of test run, in hours.

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

[40CFR§60.4244(e)]

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

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

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

C_d= VOC concentration measured as propane in ppmv.

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

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

T = Time of test run, in hours.

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

[40CFR§60.4244(f)]

g. If the permittee chooses to measure VOC emissions using either Method 18 of 40 CFR part 60, appendix A, or Method 320 of 40 CFR part 63, appendix A, then 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 section. The corrected VOC concentration can then be placed on a propane basis using Equation 6 of this section.

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

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.

$$C_{icorr} = RF_i \times C_{imeas} \qquad \text{(Eq. 5)}$$

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.

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

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

[40CFR§60.4244(g)]

11.5. Notification, Reports, and Records

11.5.1. The permittee must meet the following notification, reporting and recordkeeping requirements.

a. The permittee shall keep records of the information in paragraphs (a)(1) through (4) of this section.

1. All notifications submitted to comply with this subpart and all documentation supporting any notification.
2. Maintenance conducted on the engine.
3. If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90 and 1048.
4. If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to §60.4243(a)(2), documentation that the engine meets the emission standards.

[40CFR§60.4245(a)]

c. 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 §60.4231, the permittee must submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (c)(1) through (5) of this section.

1. Name and address of the owner or operator;
2. The address of the affected source;
3. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

4. Emission control equipment; and
5. Fuel used.

[40CFR§60.4245(c)]

c. The results of performance tests as conducted in §60.4244 shall be submitted to the Secretary within 60 days after the test has been completed.

[40CFR§60.4245(d)]

12.0. Source-Specific Requirements (40CFR60 Subpart OOOOa Requirements, Reciprocating Compressor Engines (CE-01 to CE-04))

12.1. Limitations and Standards

12.1.1. The permittee must comply with the standards in paragraphs (a) through (d) of this section for each reciprocating compressor affected facility.

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

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 permittee's 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 §60.5411a(a) and (d).

b. The permittee must demonstrate initial compliance with standards that apply to reciprocating compressor affected facilities as required by §60.5410a(c).

c. The permittee must demonstrate continuous compliance with standards that apply to reciprocating compressor affected facilities as required by §60.5415a(c).

d. The permittee must perform the reporting as required by §60.5420a(b)(1) and (4) and the recordkeeping as required by §60.5420a(c)(3), (6) through (9), and (17), as applicable.

[40CFR§60.5385a]

12.2. Initial Compliance Demonstration

12.2.1. The permittee must determine initial compliance with the standards for each affected facility using the requirements in paragraph (c) of this section. The initial compliance period begins on August 2, 2016 or upon initial startup, whichever is later, and ends no later than one year after the initial startup date for the permittee's affected facility or no later than one year after August 2, 2016. The initial compliance period may be less than one full year.

a. *NA.*

b. *NA.*

c. To achieve initial compliance with the standards for each reciprocating compressor affected facility the permittee must comply with paragraphs (c)(1) through (4) of this section.

1. If complying with §60.5385a(a)(1) or (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.

2. If complying with §60.5385a(a)(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 §60.5411a(a) and (d).

3. The permittee must submit the initial annual report for the permittee's reciprocating compressor as required in §60.5420a(b)(1) and (4).

4. The permittee must maintain the records as specified in §60.5420a(c)(3) for each reciprocating compressor affected facility.

[40CFR§60.5410a]

12.3. Continuous Compliance Demonstration

12.3.1. For each reciprocating compressor affected facility complying with §60.5385a(a)(1) or (2), the permittee must demonstrate continuous compliance according to paragraphs (1) through (3) of this section. For each reciprocating compressor affected facility complying with §60.5385a(a)(3), the permittee must demonstrate continuous compliance according to paragraph (4) of this section.

1. 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.

2. The permittee must submit the annual reports as required in §60.5420a(b)(1) and (4) and maintain records as required in §60.5420a(c)(3).

3. 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.

4. The permittee must operate the rod packing emissions collection system under negative pressure and continuously comply with the cover and closed vent requirements in §60.5416a(a) and (b). **[40CFR §60.5415a]**

12.4. Notification, Recordkeeping and Reporting Requirements

12.4.1. The permittee must submit the notifications according to paragraphs (a)(1) and (2) of this section if the permittee owns or operates one or more of the affected facilities specified in §60.5365a that was constructed, modified or reconstructed during the reporting period.
[40CFR§60.5420a(a)]

12.4.2. Reporting requirements. The permittee must submit annual reports containing the information specified in paragraphs (b)(1) and (4) of this section to the Administrator and performance test reports as specified in paragraph (b)(9) of this section. The permittee must submit annual reports following the procedure specified in paragraph (b)(11) of this section. The initial annual report is due no later than 90 days after the end of the initial compliance period as determined according to §60.5410a. Subsequent annual reports are due no later than same date each year as the initial annual report. If the permittee owns or operates more than one affected facility, the permittee may submit one report for multiple affected facilities provided the report contains all of the information required as specified in paragraphs (b)(1) and (4) of this section. 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 this part may be submitted as long as the schedule does not extend the reporting period.

(1) The general information specified in paragraphs (1)(i) through (iv) of this section.

(i) The company name, facility site name associated with the affected facility, US Well ID or US Well ID associated with the affected facility, if applicable, and address of the affected facility. If an address is not available for the site, include a description of the site location and provide the latitude and longitude coordinates of the site in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983.

(ii) An identification of each affected facility being included in the annual report.

(iii) Beginning and ending dates of the reporting period.

(iv) 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.

(4) For each reciprocating compressor affected facility, the information specified in paragraphs (i) through (ii) of this section.

(i) 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.

(ii) Records of deviations specified in paragraph (c)(3)(iii) of this section that occurred during the reporting period.

[40CFR§60.5420a]

12.4.3. To demonstrate compliance with permit condition 12.1.1.d, the permittee shall maintain the reporting as required by §60.5420a(b)(1) and (4) and the recordkeeping as required by §60.5420a(c)(3), (6) through (9), and (17), as applicable.

13.0 Source-Specific Requirements (40CFR60 Subpart OOOOa Requirements Fugitive Emissions)

13.1 Limitations and Standards

13.1.1. For each affected facility under §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 section. These requirements are independent of the closed vent system and cover requirements in §60.5411a.

(a) The permittee must monitor all fugitive emission components, as defined in §60.5430a, in accordance with paragraphs (b) through (g) of this section. The permittee must repair all sources of fugitive emissions in accordance with paragraph (h) of this section. The permittee must keep records in accordance with paragraph (i) of this section and report in accordance with paragraph (j) of this section. For purposes of this section, fugitive emissions are defined as: Any visible emission from a fugitive emissions component observed using optical gas imaging or an instrument reading of 500 ppm or greater using Method 21.

(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 section.

(c) Fugitive emissions monitoring plans must include the elements specified in paragraphs (c)(1) through (8) of this section, 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 section.

(2) Technique for determining fugitive emissions (i.e., Method 21 at 40 CFR part 60, appendix A-7, or optical gas imaging).

(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 emission components that are unsafe to repair. The permittee's repair schedule must meet the requirements of paragraph (h) of this section at a minimum.

(5) Procedures and timeframes for verifying fugitive emission component repairs.

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

(7) If the permittee is using optical gas imaging, the permittee's plan must also include the elements specified in paragraphs (c)(7)(i) through (vii) of this section.

(i) Verification that the permittee's optical gas imaging equipment meets the specifications of paragraphs (c)(7)(i)(A) and (B) of this section. 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 fugitives emissions monitoring program with optical gas imaging, a fugitive emission is defined as any visible emissions observed using optical gas imaging.

(A) The permittee's 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 permittee's 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 ≤60g/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 section.

(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 the permittee is using Method 21 of appendix A-7 of this part, the permittee's plan must also include the elements specified in paragraphs (c)(8)(i) and (ii) of this section. For the purposes of complying with the fugitive emissions monitoring program using Method 21 a fugitive emission is defined as an instrument reading of 500 ppm or greater.

(i) Verification that the permittee's monitoring equipment meets the requirements specified in Section 6.0 of Method 21 at 40 CFR 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 permittee's 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 CFR part 60, appendix A-7, including Section 8.3.1.

(d) Each fugitive emissions monitoring plan must include the elements specified in paragraphs (d)(1) through (4) of this section, at a minimum, as applicable.

(1) Sitemap.

(2) A defined observation path that ensures that all fugitive emissions components are within sight of the path. The observation path must account for interferences.

(3) If the permittee is using Method 21, the permittee's plan must also include a list of fugitive emissions components to be monitored and method for determining location of fugitive emissions components to be monitored in the field (e.g. tagging, identification on a process and instrumentation diagram, etc.).

(4) The permittee's plan must also include the written plan developed for all of the fugitive emission components designated as difficult-to-monitor in accordance with paragraph (g)(3)(i) of this section, and the written plan for fugitive emission components designated as unsafe-to-monitor in accordance with paragraph (g)(3)(ii) of this section.

(e) Each monitoring survey shall observe each fugitive emissions component, as defined in §60.5430a, for fugitive emissions.

(f)

(1) *NA*

(2) The permittee must conduct an initial monitoring survey within 60 days of the startup of a new compressor station for each new collection of fugitive emissions components at the new compressor station or by June 3, 2017, whichever is later. For a modified collection of fugitive components at a compressor station, the initial monitoring survey must be conducted within 60 days of the modification or by June 3, 2017, whichever is later.

(g) A monitoring survey of each collection of fugitive emissions components at a compressor station must be performed at the frequencies specified in paragraphs (g)(1) and (2) of this section, with the exceptions noted in paragraphs (g)(3) and (4) of this section.

(1) A monitoring survey of the collection of fugitive emissions components at a compressor station within a company-defined area 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)(3)(i) through (iv) of this section.

(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 section.

(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)(4)(i) through (iv) of this section.

(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 section.

(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.

(4) The requirements of paragraph (g)(2) of this section are waived for any collection of fugitive emissions components at a compressor station located within an area that has an average calendar month temperature below 0°Fahrenheit for two of three consecutive calendar months of a quarterly monitoring period. The calendar month temperature average for each month within the quarterly monitoring period must be determined using historical monthly average temperatures over the previous three years as reported by a National Oceanic and Atmospheric Administration source or other source approved by the Administrator. The requirements of paragraph (g)(2) of this section shall not be waived for two consecutive quarterly monitoring periods.

(h) Each identified source of fugitive emissions shall be repaired or replaced in accordance with paragraphs (h)(1) and (2) of this section. For fugitive emissions components also subject to the repair provisions of §§60.5416a(b)(9) through (12) and (c)(4) through (7), those provisions apply instead to those closed vent system and covers, and the repair provisions of paragraphs (h)(1) and (2) of this section do not apply to those closed vent systems and covers.

(1) Each identified source of fugitive emissions shall be repaired or replaced as soon as practicable, but no later than 30 calendar days after detection of the fugitive emissions.

(2) If the repair or replacement 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 or replacement must be completed during the next compressor station shutdown, after an unscheduled, planned or emergency vent blowdown or within 2 years, whichever is earlier.

(3) Each repaired or replaced fugitive emissions component must be resurveyed as soon as practicable, but no later than 30 days after being repaired, to ensure that there are no fugitive emissions.

(i) For repairs that cannot be made during the monitoring survey when the fugitive emissions are initially found, the operator may resurvey the repaired fugitive emissions components using either Method 21 or optical gas imaging within 30 days of finding such fugitive emissions.

(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 for identification purposes. The digital photograph must include the date that the photograph was taken, 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 to resurvey the repaired fugitive emissions components are subject to the resurvey provisions specified in paragraphs (h)(3)(iii)(A) and (B) of this section.

(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 are used.

(B) Operators must use the Method 21 monitoring requirements specified in paragraph (c)(8)(ii) of this section or the alternative screening procedures specified in section 8.3.3 of Method 21.

(iv) Operators that use optical gas imaging to resurvey the repaired fugitive emissions components, are subject to the resurvey provisions specified in paragraphs (h)(3)(iv)(A) and (B) of this section.

(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 section.

(i) Records for each monitoring survey shall be maintained as specified §60.5420a(c)(15).

(j) Annual reports shall be submitted for each collection of fugitive emissions components at a compressor station that include the information specified in §60.5420a(b)(7). Multiple collection of fugitive emissions components at a compressor station may be included in a single annual report.

13.2. Initial Compliance Demonstration

13.2.1. The permittee must determine initial compliance with the standards for each affected facility using the requirements in paragraphs (a) through (j) of this section. The initial compliance period begins on August 2, 2016, or upon initial startup, whichever is later, and ends no later than 1 year after the initial startup date for the permittee's affected facility or no later than 1 year after August 2, 2016. The initial compliance period may be less than one full year.
[40 C.F.R. § 60.5410a]

13.2.2. To achieve initial compliance with the fugitive emission standards for each collection of fugitive emissions components at a compressor station, the permittee must comply with paragraphs (j)(1) through (5) of this section.

(1) The permittee must develop a fugitive emissions monitoring plan as required in §60.5397a(b)(c), and (d).

(2) The permittee must conduct an initial monitoring survey as required in §60.5397a(f).

(3) The permittee must maintain the records specified in §60.5420a(c)(15).

(4) The permittee must repair each identified source of fugitive emissions for each affected facility as required in §60.5397a(h).

(5) The permittee must submit the initial annual report for each collection of fugitive emissions components at a compressor station compressor station as required in §60.5420a(b)(1) and (7).
[40 C.F.R. § 60.5410a(j)]

13.3. Continuous Compliance Demonstration

13.3.1. For each collection of fugitive emissions components at a compressor station, the permittee must demonstrate continuous compliance with the fugitive emission standards specified in §60.5397a according to paragraphs (h)(1) through (4) of this section.

(1) The permittee must conduct periodic monitoring surveys as required in §60.5397a(g).

(2) The permittee must repair or replace each identified source of fugitive emissions as required in §60.5397a(h).

(3) The permittee must maintain records as specified in §60.5420a(c)(15).

(4) The permittee must submit annual reports for each collection of fugitive emissions components at a compressor station as required in §60.5420a(b)(1) and (7).

[40 C.F.R. § 60.5415a(h)]

13.4. Notification, Recordkeeping and Reporting Requirements

13.4.1. The permittee must submit the notifications according to paragraphs (a)(1) and (2) of this section if the permittee owns or operates one or more of the affected facilities specified in §60.5365a that was constructed, modified or reconstructed during the reporting period.

(1) If the permittee owns or operates an affected facility that is the group of all equipment within a process unit at an onshore natural gas processing plant, or a sweetening unit at an onshore natural gas processing plant, the permittee must submit the notifications required in §60.7(a)(1), (3), and (4). If the permittee owns or operates a reciprocating compressor, pneumatic controller, pneumatic pump, storage vessel, or collection of fugitive emissions components at a compressor station, the permittee is not required to submit the notifications required in §60.7(a)(1), (3), and (4).

[40 C.F.R. § 60.5420a(a)]

13.4.2. *Reporting requirements.* The permittee must submit annual reports containing the information specified in paragraphs (b)(1) through (8) and (12) of this section and performance test reports as specified in paragraph (b)(9) or (10) of this section, if applicable. The permittee must submit annual reports following the procedure specified in paragraph (b)(11) of this section. The initial annual report is due no later than 90 days after the end of the initial compliance period as determined according to §60.5410a. Subsequent annual reports are due no later than same date each year as the initial annual report. If the permittee owns or operates more than one affected facility, the permittee may submit one report for multiple affected facilities provided the report contains all of the information required as specified in paragraphs (b)(1) through (8) of this section. 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 this part may be submitted as long as the schedule does not extend the reporting period.

(1) The general information specified in paragraphs (b)(1)(i) through (iv) of this section for all reports.

(i) The company name, facility site name associated with the affected facility, US Well ID or US Well ID associated with the affected facility, if applicable, and address of the affected facility. If an address is not available for the site, include a description of the site location and provide the latitude and longitude coordinates of the site in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983.

(ii) An identification of each affected facility being included in the annual report.

(iii) Beginning and ending dates of the reporting period.

(iv) 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.

(7) For the collection of fugitive emissions components at each compressor station within the company-defined area, the records of each monitoring survey including the information specified in paragraphs (b)(7)(i) through (xii) of this section. For the collection of fugitive emissions components at a compressor station, if a monitoring survey is waived under §60.5397a(g)(5), the permittee must include in the permittee's annual report the fact that a monitoring survey was waived and the calendar months that make up the quarterly monitoring period for which the monitoring survey was waived.

(i) Date of the survey.
(ii) Beginning and end time of the survey.
(iii) Name of operator(s) performing survey. If the survey is performed by optical gas imaging, the permittee must note the training and experience of the operator.
(iv) Ambient temperature, sky conditions, and maximum wind speed at the time of the survey.
(v) Monitoring instrument used.
(vi) Any deviations from the monitoring plan or a statement that there were no deviations from the monitoring plan.
(vii) Number and type of components for which fugitive emissions were detected.
(viii) Number and type of fugitive emissions components that were not repaired as required in §60.5397a(h).
(ix) Number and type of difficult-to-monitor and unsafe-to-monitor fugitive emission components monitored.
(x) The date of successful repair of the fugitive emissions component.
(xi) Number and type of fugitive emission components placed on delay of repair and explanation for each delay of repair.
(xii) Type of instrument used to resurvey a repaired fugitive emissions component that could not be repaired during the initial fugitive emissions finding.

[40 C.F.R. § 60.5420a(b)]

13.4.3. *Recordkeeping requirements.* The permittee must maintain the records identified as specified in §60.7(f) and in paragraphs (c)(1) through (16) of this section. All records required by this subpart must be maintained either onsite or at the nearest local field office for at least 5 years. Any records required to be maintained by this subpart that are submitted electronically via the EPA's CDX may be maintained in electronic format.

(15) For each collection of fugitive emissions components at a compressor station, the records identified in paragraphs (c)(15)(i) through (iii) of this section.
(i) The fugitive emissions monitoring plan as required in §60.5397a(b), (c), and (d).

(ii) The records of each monitoring survey as specified in paragraphs (c)(15)(ii)(A) through (I) of this section.

(A) Date of the survey.

(B) Beginning and end time of the survey.

(C) Name of operator(s) performing survey. The permittee must note the training and experience of the operator.

(D) Monitoring instrument used.

(E) When optical gas imaging is used to perform the survey, one or more digital photographs or videos, captured from the optical gas imaging instrument used for conduct of monitoring, of each required monitoring survey being performed. The digital photograph must include the date the photograph was taken and the latitude and longitude of the collection of fugitive emissions components at a compressor station imbedded within or stored with the digital file. As an alternative to imbedded latitude and longitude within the digital file, the digital photograph or video may consist of an image of the monitoring survey being performed with a separately operating GPS device within the same digital picture or video, provided the latitude and longitude output of the GPS unit can be clearly read in the digital image.

(F) Fugitive emissions component identification when Method 21 is used to perform the monitoring survey.

(G) Ambient temperature, sky conditions, and maximum wind speed at the time of the survey.

(H) Any deviations from the monitoring plan or a statement that there were no deviations from the monitoring plan.

(I) Documentation of each fugitive emission, including the information specified in paragraphs (c)(15)(ii)(I)(1) through (12) of this section.

(1) Location.

(2) Any deviations from the monitoring plan or a statement that there were no deviations from the monitoring plan.

(3) Number and type of components for which fugitive emissions were detected.

(4) Number and type of difficult-to-monitor and unsafe-to-monitor fugitive emission components monitored.

(5) Instrument reading of each fugitive emissions component that requires repair when Method 21 is used for monitoring.

(6) Number and type of fugitive emissions components that were not repaired as required in §60.5397a(h).

(7) Number and type of components that were tagged as a result of not being repaired during the monitoring survey when the fugitive emissions were initially found as required in §60.5397a(h)(3)(ii).

(8) If a fugitive emissions component is not tagged, a digital photograph or video of each fugitive emissions component that could not be repaired during the monitoring survey when the fugitive emissions were initially found as required in §60.5397a(h)(3)(ii). The digital photograph or video must clearly identify the location of the component that must be repaired. Any digital photograph or video required under this paragraph can also be used to meet the requirements under paragraph (c)(15)(ii)(E) of this section, as long as the photograph or video is taken with the optical gas imaging instrument, includes the date and the latitude and longitude are either imbedded or visible in the picture.

(9) Repair methods applied in each attempt to repair the fugitive emissions components.

(10) Number and type of fugitive emission components placed on delay of repair and explanation for each delay of repair.

(11) The date of successful repair of the fugitive emissions component.

(12) Instrumentation used to resurvey a repaired fugitive emissions component that could not be repaired during the initial fugitive emissions finding.

(iii) For the collection of fugitive emissions components at a compressor station, if a monitoring survey is waived under §60.5397a(g)(5), The permittee must maintain records of the average calendar month temperature, including the source of the information, for each calendar month of the quarterly monitoring period for which the monitoring survey was waived.

[40 C.F.R. § 60.5420a(c)]

14.0. Source-Specific Requirements (40CFR63 Subpart ZZZZ Requirements (CE-01 thru CE-04))

14.1. Limitations and Standards

14.1.1. The permittee must comply with the applicable operating limitations in this section no later than October 19, 2013.
[40 C.F.R. § 63.6595(a)]

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

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 this part by meeting the requirements of 40 CFR part 60 subpart JJJJ.
[40 C.F.R. § 63.6590(c)]

CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature[1] _____ _____
(please use blue ink) Responsible Official or Authorized Representative Date

Name & Title _____ _____
(please print or type) Name Title

Telephone No. _____ Fax No. _____

[1] This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:

a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

(i) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), or

(ii) the delegation of authority to such representative is approved in advance by the Director;

b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of U.S. EPA); or

d. The designated representative delegated with such authority and approved in advance by the Director.

****** End of Application for Initial 45CSR30 Title V Operating Permit (TVOP) ******