



April 20, 2015

CERTIFIED MAIL 7013 2630 0001 2576 8559

Division of Air Quality
West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

**Re: Application for General Permit G&0A
Bogges Well Pad
Marion County, West Virginia**

To Whom It May Concern:

XTO Energy Inc. (XTO) hereby submits the following Application for General Permit G-70A Registration to the West Virginia Department of Environmental Protection (WVDEP) for authorization of the Bogges Well Pad. This application has been prepared in accordance with the WVDEP Class II general permit registration requirements.

Please note that the Class II General Permit Registration Fee of \$1500 has been included and two (2) copies of the registration.

Upon issuance of this permit please void the G30-D167 permit. These two locations will be on adjacent properties and must be permitted together. The application that is being submitted covers both locations. The G30-D167 permit is held by Mountain Gathering, LLC. which is a subsidiary of XTO Energy, Inc.

A copy of the legal advertisement is included in the package. Once the original cut sheet is mailed to XTO Energy, Inc., it will be submitted to the agency.

Thank you in advance for your review and concurrence with this permit application. If you have any questions regarding the information presented in this submittal, please do not hesitate to contact me at (817) 885-2845.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Dustin Simpson'.

Dustin Simpson
Environmental Advisor

WV DEP - Division of Air Quality

Boggess Well Pad

Harrison County, West Virginia

WV G-70A General Permit Application



Prepared by:

Dustin Simpson

Environmental Advisor

XTO Energy, Inc.

4/13/2015

Boggess Well Pad

G 70A Permit Application

Table of Attachments

Section #1	Project Description
Section #2	G70A Application Form
Attachment A	Current Business Certificate
Attachment B	Process Description
Attachment C	Description of Fugitive Emissions
Attachment D	Process Flow Diagram
Attachment E	Plot Plan
Attachment F	Area Map
Attachment G	Emission Unit Data Sheets
Attachment H	Air Pollution Control Device Data Sheet
Attachment I	Emission Calculations
Attachment J	Class I Legal Advertisement
Attachment K	Electronic Submittal
Attachment L	Application Fee
Attachment M	Siting Criteria Waiver
Attachment N	Material Safety Data Sheets
Attachment O	Emissions Summary Sheet
Attachment P	Other Supporting Documentation

Section #1
Project Description

Project Description

Four States Pad Harrison County, West Virginia XTO Energy, Inc.

XTO Energy, Inc. is submitting this G70A permit application for the Boggess Well Pad located in Harrison County, West Virginia. The facility is a natural gas production facility. The facility consists of (4) well heads, (4) two phase separators, (4) 0.5 MMBtu/hr line heaters, (4) 400 bbl produced water tanks, (1) truck loading rack, fugitive components, and other equipment typical to a natural gas production facility.

The well heads are subject to NSPS OOOO. The produced water tanks are below 6 tpy each uncontrolled and the pneumatic devices at the site are intermittent low bleed. Neither of these sources are subject to NSPS OOOO.

Section #2
G70A Application Form



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

APPLICATION FOR GENERAL PERMIT REGISTRATION
 CONSTRUCT, MODIFY, RELOCATE OR ADMINISTRATIVELY UPDATE
 A STATIONARY SOURCE OF AIR POLLUTANTS

- CONSTRUCTION MODIFICATION RELOCATION CLASS I ADMINISTRATIVE UPDATE
 CLASS II ADMINISTRATIVE UPDATE

CHECK WHICH TYPE OF GENERAL PERMIT REGISTRATION YOU ARE APPLYING FOR:

- | | |
|---|---|
| <input type="checkbox"/> G10-D – Coal Preparation and Handling | <input type="checkbox"/> G40-C – Nonmetallic Minerals Processing |
| <input type="checkbox"/> G20-B – Hot Mix Asphalt | <input type="checkbox"/> G50-B – Concrete Batch |
| <input type="checkbox"/> G30-D – Natural Gas Compressor Stations | <input type="checkbox"/> G60-C - Class II Emergency Generator |
| <input type="checkbox"/> G33-A – Spark Ignition Internal Combustion Engines | <input type="checkbox"/> G65-C – Class I Emergency Generator |
| <input type="checkbox"/> G35-A – Natural Gas Compressor Stations (Flare/Glycol Dehydration Unit) | <input checked="" type="checkbox"/> G70-A – Class II Oil and Natural Gas Production Facility |

SECTION I. GENERAL INFORMATION

1. Name of applicant (as registered with the WV Secretary of State's Office): <u>XTO Energy, Inc.</u>	2. Federal Employer ID No. (FEIN): <u>75-2347769</u>
--	---

3. Applicant's mailing address: <u>810 Houston Street</u> <u>Fort Worth, TX 76102</u>	4. Applicant's physical address: <u>810 Houston Street</u> <u>Fort Worth, TX 76102</u>
---	--

5. If applicant is a subsidiary corporation, please provide the name of parent corporation:

6. **WV BUSINESS REGISTRATION.** Is the applicant a resident of the State of West Virginia? YES NO

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

SECTION II. FACILITY INFORMATION

7. Type of plant or facility (stationary source) to be constructed, modified, relocated or administratively updated (e.g., coal preparation plant, primary crusher, etc.): <u>Oil and Natural Gas Production Facility</u>	8a. Standard Industrial Classification Classification (SIC) code: <u>1311</u>	AND	8b. North American Industry System (NAICS) code: <u>21311</u>
---	--	-----	---

9. DAQ Plant ID No. (for existing facilities only): _____	10. List all current 45CSR13 and other General Permit numbers associated with this process (for existing facilities only): _____ _____ _____
--	---

A: PRIMARY OPERATING SITE INFORMATION

11A. Facility name of primary operating site: <u>Boggess Well Pad</u>	12A. Address of primary operating site: Mailing: <u>N/A</u> Physical: _____ _____	
13A. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO - IF YES, please explain: <u>This is leased land</u> _____ - IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.		
14A. - For Modifications or Administrative Updates at an existing facility, please provide directions to the present location of the facility from the nearest state road; - For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a MAP as Attachment F. <u>From the Intersection of State Hwy 20 and County Road 20/7(Reeses Run Rd) Travel NW on CR 20/7 for 1 mile. The entrance to the location will be on the left.</u>		
15A. Nearest city or town: <u>Lumberport</u>	16A. County: <u>Harrison</u>	17A. UTM Coordinates: Northing (KM): <u>435.869893</u> Easting (KM): <u>55.290185</u> Zone: <u>-17 N</u>
18A. Briefly describe the proposed new operation or change (s) to the facility: <u>This is a natural gas production facility with produced water tanks.</u>		19A. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: <u>39.376144</u> Longitude: <u>-80.385803</u>

B: 1ST ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits)

11B. Name of 1 st alternate operating site: _____ _____	12B. Address of 1 st alternate operating site: Mailing: <u>NA</u> Physical: _____ _____
13B. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? <input type="checkbox"/> YES <input type="checkbox"/> NO - IF YES, please explain: _____ _____ - IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.	
14B. - For Modifications or Administrative Updates at an existing facility, please provide directions to the present location of the facility from the nearest state road; - For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a MAP as Attachment F. _____ _____ _____	

15B. Nearest city or town:	16B. County:	17B. UTM Coordinates: Northing (KM): _____ Easting (KM): _____ Zone: _____
18B. Briefly describe the proposed new operation or change (s) to the facility:		19B. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____

C: 2ND ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits):

11C. Name of 2 nd alternate operating site: _____ _____	12C. Address of 2 nd alternate operating site: Mailing: _____ Physical: _____
--	---

13C. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? YES NO

- IF YES, please explain: _____

- IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.

14C. - For **Modifications or Administrative Updates** at an existing facility, please provide directions to the present location of the facility from the nearest state road;

- For Construction or Relocation permits, please provide directions to the proposed new site location from the nearest state road. Include a **MAP as Attachment F.**

15C. Nearest city or town:	16C. County:	17C. UTM Coordinates: Northing (KM): _____ Easting (KM): _____ Zone: _____
----------------------------	--------------	---

18C. Briefly describe the proposed new operation or change (s) to the facility:	19C. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____
---	--

20. Provide the date of anticipated installation or change: <u>6/30/2015</u> <input type="checkbox"/> If this is an After-The-Fact permit application, provide the date upon which the proposed change did happen: :	21. Date of anticipated Start-up if registration is granted: <u>6/30/2015</u>
---	--

22. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application if other than 8760 hours/year. (Note: anything other than 24/7/52 may result in a restriction to the facility's operation).

Hours per day 24 Days per week 7 Weeks per year 52 Percentage of operation 100

SECTION III. ATTACHMENTS AND SUPPORTING DOCUMENTS

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

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

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

25. Please check all attachments included with this permit application. Please refer to the appropriate reference document for an explanation of the attachments listed below.

- ATTACHMENT A : CURRENT BUSINESS CERTIFICATE
- ATTACHMENT B: PROCESS DESCRIPTION
- ATTACHMENT C: DESCRIPTION OF FUGITIVE EMISSIONS
- ATTACHMENT D: PROCESS FLOW DIAGRAM
- ATTACHMENT E: PLOT PLAN
- ATTACHMENT F: AREA MAP
- ATTACHMENT G: EQUIPMENT DATA SHEETS AND REGISTRATION SECTION APPLICABILITY FORM
- ATTACHMENT H: AIR POLLUTION CONTROL DEVICE SHEETS
- ATTACHMENT I: EMISSIONS CALCULATIONS
- ATTACHMENT J: CLASS I LEGAL ADVERTISEMENT
- ATTACHMENT K: ELECTRONIC SUBMITTAL
- ATTACHMENT L: GENERAL PERMIT REGISTRATION APPLICATION FEE
- ATTACHMENT M: SITING CRITERIA WAIVER

- ATTACHMENT N: MATERIAL SAFETY DATA SHEETS (MSDS)
- ATTACHMENT O: EMISSIONS SUMMARY SHEETS
- OTHER SUPPORTING DOCUMENTATION NOT DESCRIBED ABOVE (Equipment Drawings, Aggregation Discussion, etc.)

Please mail an original and two copies of the complete General Permit Registration Application with the signature(s) to the DAQ Permitting Section, at the address shown on the front page of this application. Please **DO NOT** fax permit applications. For questions regarding applications or West Virginia Air Pollution Rules and Regulations, please refer to the website shown on the front page of the application or call the phone number also provided on the front page of the application.

SECTION IV. CERTIFICATION OF INFORMATION

This General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of a Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, Emission Inventory, Certified Emission Statement, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. Any administratively incomplete or improperly signed or unsigned Registration Application will be returned to the applicant.

FOR A CORPORATION (domestic or foreign)

I certify that I am a President, Vice President, Secretary, Treasurer or in charge of a principal business function of the corporation

FOR A PARTNERSHIP

I certify that I am a General Partner

FOR A LIMITED LIABILITY COMPANY

I certify that I am a General Partner or General Manager

FOR AN ASSOCIATION

I certify that I am the President or a member of the Board of Directors

FOR A JOINT VENTURE

I certify that I am the President, General Partner or General Manager

FOR A SOLE PROPRIETORSHIP

I certify that I am the Owner and Proprietor

I hereby certify that (please print or type) Dustin Simpson is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Office of Air Quality immediately, and/or,

I hereby certify that all information contained in this General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible

Signature _____

(please use blue ink)

Responsible Official

4/14/15

Date

Name & Title Michael Johnson, Vice President – Production Operations Appalachia

(please print or type)

Signature _____

(please use blue ink)

Authorized Representative (if applicable)

4/20/15

Date

Applicant's Name XTO Energy, Inc.

Phone & Fax

817-885-2845

Phone

817-885-1847

Fax

Email dustin_simpson@xtoenergy.com

Attachment A
Current Business Certificate

State of West Virginia



Certificate

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

XTO ENERGY INC.

a corporation formed under the laws of Delaware filed an application to be registered as a foreign corporation authorizing it to transact business in West Virginia. The application was found to conform to law and a "Certificate of Authority" was issued by the West Virginia Secretary of State on May 30, 2008.

I further certify that the corporation has not been revoked by the State of West Virginia nor has a Certificate of Withdrawal been issued to the corporation by the West Virginia Secretary of State.

Accordingly, I hereby issue this

CERTIFICATE OF AUTHORIZATION

Validation ID:6WV5R_YEDXX



Given under my hand and the Great Seal of the State of West Virginia on this day of March 10, 2015

Natalie E. Tennant

Secretary of State

CM

State of West Virginia



Certificate

I, Betty Ireland, Secretary of State of the State of West Virginia, hereby certify that

XTO ENERGY INC.

Control Number: 999BI

a corporation formed under the laws of Delaware has filed its "Application for Certificate of Authority" to transact business in West Virginia as required by the provisions of the West Virginia Code. I hereby declare the organization to be registered as a foreign corporation from its effective date of May 30, 2008.

Therefore, I issue this

CERTIFICATE OF AUTHORITY

to the corporation authorizing it to transact business in West Virginia



Given under my hand and the Great Seal of the State of West Virginia on this day of May 30, 2008

Betty Ireland

Secretary of State

Betty Ireland
Secretary of State
State Capitol
1900 Kanawha Blvd. E.
Charleston, WV 25305
FILE ONE ORIGINAL
FEES PER SCHEDULE

**CERTIFICATE OF
AUTHORITY**

Handwritten signature

Penney Barker, Manager
Corporations Division
Tel. (304) 558-8000
Fax (304) 558-8381
www.wvsos.com
Hours: 8:30am-5:00pm
PLEASE READ INSTRUCTIONS

CTRL # 999BT

1. HOME STATE INFORMATION:

- a. The name of the corporation as it is registered in its home state is: XTO Energy Inc.
- b. State of Delaware Date of Incorp. 10/9/90 Duration (# yrs. or perpetual) perpetual
Warning: Tax reporting requirements in West Va. will not end until a withdrawal is filed.
- c. NAIC # _____ (If an insurance company)

FILED

2. PRINCIPAL OFFICE INFORMATION:

- a. Address of the principal office of the corporation: No. & Street 810 Houston Street MAY 30 2008
City/State/Zip Fort Worth, TX 76102
- b. Mailing address, if different, from above address: Street/PO Box _____
City/State/Zip _____

IN THE OFFICE OF
SECRETARY OF STATE
WEST VIRGINIA

3. WEST VIRGINIA INFORMATION:

- a. Corporate name to be used in W. Va.: (check one, follow instructions)
 Home state name as listed on line 1.a. above, if available.
 DBA name
- b. Address of registered office in West Virginia, if any: No. & Street _____
City/State/Zip _____
- c. Mailing address in WV, if different, from above: Street/PO Box _____
City/State/Zip _____
- d. Proposed purpose(s) for transaction of business in WV: Oil and Gas

4. AGENT OF PROCESS:

Properly designated person to whom notice of process may be sent, if any:

Name Corporation Service Company
Address 209 West Washington Street, Charleston, WV 25302

5. **CORPORATE STATUS INFORMATION:**

- a. Corporation is organized as (check one): For profit
 Non-profit

b. Directors and Officers: (Add extra page if necessary; please list all officers)

Officer	Name	Address
(see attached)	(see attached)	(see attached)

6. The number of acres of land it holds or expects to hold in West Virginia is: 0

7. **Contact and Signature Information**

- a. Frank G. McDonald (817) 870-2800
Contact Name Phone Number
- b. Frank G. McDonald Sr. VP, GC and Asst. Secretary
Print or type name of signer Title or Capacity of Signer
- c. Signature of Signer:  Date: May 8, 2008

XTO ENERGY INC.

Directors:

Class I Phillip R. Kevil, Herbert D. Simons; Vaughn O. Vennerberg II (expires 5/09)
Class II Lane G. Collins, Scott G. Sherman, Bob R. Simpson (expires 5/10)
Class III William H. Adams III, Keith A. Hutton, Jack P. Randall (expires 5/08)

Business Address for XTO Energy Inc. Officers and Directors:

810 Houston Street, Fort Worth, TX 76102

Officers:

Chairman of the Board and Chief Executive Officer	Bob R. Simpson
President	Keith A. Hutton
Senior Executive Vice President and Chief of Staff	Vaughn O. Vennerberg II
Executive Vice President and Chief Financial Officer	Louis G. Baldwin
Executive Vice President - Acquisitions	Timothy L. Petrus
Senior Vice President and Treasurer	Brent W. Clum
Senior Vice President - Land	James L. Death
Senior Vice President - Natural Gas Operations	Nick J. Dungey
Senior Vice President - East Texas Operations	Ken K. Kirby
Senior Vice President and Controller	Bennie G. Kniffen
Senior Vice President, General Counsel and Assistant Secretary	Frank G. McDonald
Senior Vice President - Reservoir Engineering	F. Terry Perkins
Senior Vice President - Geology & Geophysics	Mark J. Pospisil
Senior Vice President - Land Administration	Edwin S. Ryan, Jr.
Senior Vice President - Marketing	Terry L. Schultz
Senior Vice President - Mid-Continent Operations	Douglas C. Schultze
Senior Vice President - Investor Relations and Finance	Gary D. Simpson
Senior Vice President - Engineering	Kenneth F. Staab
Senior Vice President - Taxation	Mark A. Stevens
Vice President - Financial Reporting	Scott T. Agosta
Vice President & Corporate Secretary	Virginia N. Anderson
Vice President, Associate General Counsel & Assistant Secretary	Kathy L. Cox
Vice President Operations - San Juan Division	Del L. Craddock
Vice President Operations - Permian Division & Alaska	Kyle M. Hammond
Vice President - Environmental, Health & Safety	Nina C. Hutton
Vice President Operations - Fort Worth Division	Timothy B. McIlwain
Vice President - Information Technology	L. Frank Thomas III
Vice President - Facilities	T. Joy Webster
Vice President - Human Resources	Karen S. Wilson
Assistant Treasurer	William B. Butler
Assistant Controller	Martha L. Montgomery

Delaware

PAGE 1

The First State

I, HARRIET SMITH WINDSOR, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "XTO ENERGY INC." IS DULY INCORPORATED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL CORPORATE EXISTENCE SO FAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE SIXTH DAY OF MAY, A.D. 2008.

AND I DO HEREBY FURTHER CERTIFY THAT THE SAID "XTO ENERGY INC." WAS INCORPORATED ON THE NINTH DAY OF OCTOBER, A.D. 1990.

AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL REPORTS HAVE BEEN FILED TO DATE.

AND I DO HEREBY FURTHER CERTIFY THAT THE FRANCHISE TAXES HAVE BEEN PAID TO DATE.

2243325 8300

080510772

You may verify this certificate online
at corp.delaware.gov/authver.shtml



Harriet Smith Windsor

Harriet Smith Windsor, Secretary of State

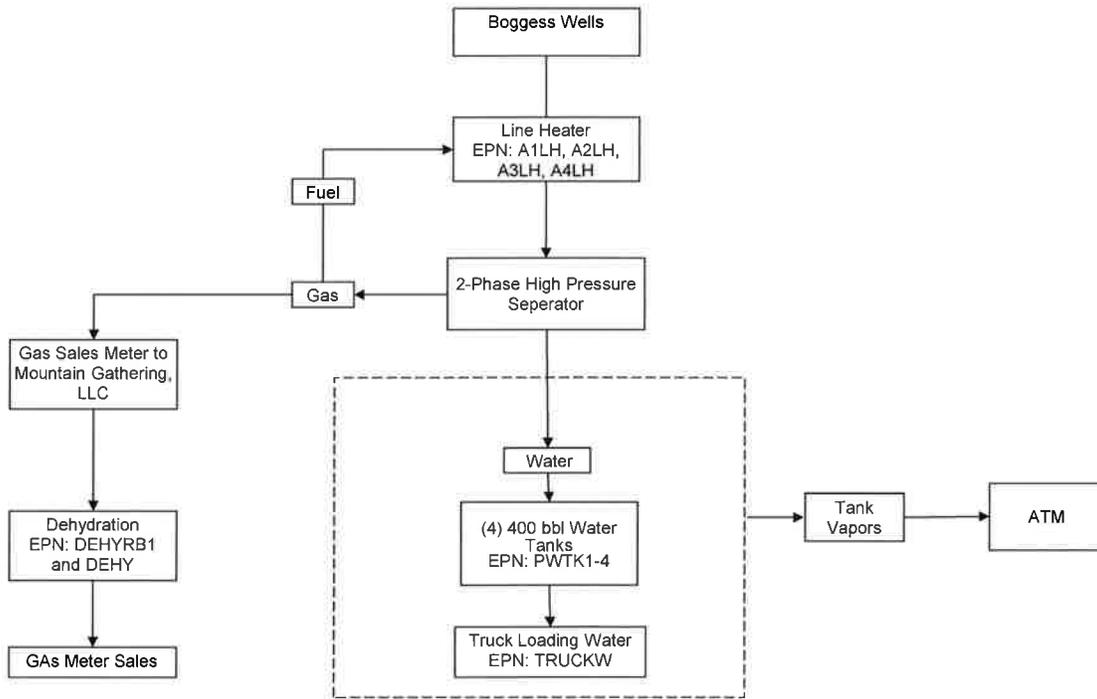
AUTHENTICATION: 6572039

DATE: 05-06-08

Attachment B
Process Description

XTO Energy, Inc Boggess Well Pad

Process Flow Diagram



Process Description

Associated gas and liquids production from the Boggess Wells flow through a line heater and then to the the 2-phase high pressure separator. The gas is sent to sales. The produced liquids go into four (4) 400 bbl water storage tanks (PWTK1-4) on the site. Some gas is used as fuel for the line heaters to aid in keeping hydrates from freezing in the lines. Water is trucked off site from the storage tanks. Sometimes gas is vented from the equipment to allow for MSS activities. Truck loading emissions include PM emissions for the miles traveled by the loading trucks. Gas sold to Mountain Gathering, LLC, is processed through a dehydrator and then sold via pipeline sales.

Attachment C
Description of Fugitive Emissions

Description of Fugitive Emissions

**Boggess Well Pad
Harrison County, West Virginia
XTO Energy, Inc.**

Included with this description is the G-70A Fugitive Emissions Summary Sheet. Fugitive Emissions were provided for PM10 and NMNEVOC with reference to water hauling from the storage vessels at the facility. The PM10 occurred from the traffic over an unpaved road to the well site totaling 1 mile round trip per load. The NMNEVOC occurred from vapors released during the loading of produced water.

Fugitive Emissions for NMNEVOC were provided for equipment leaks. The calculation methodology is based off AP-42 and component counts. The leak source data sheet is not included in this application because none of the sources handle material streams with a VOC weight percent greater than 10%.

Fugitive Emissions for NMNEVOC were provided for equipment blowdowns. The calculations methodology is based off material balance and the max number of equipment blowdowns annually.

All calculations for fugitive emissions can be found in Attachment I of this application.

G70-A FUGITIVE EMISSIONS SUMMARY SHEET

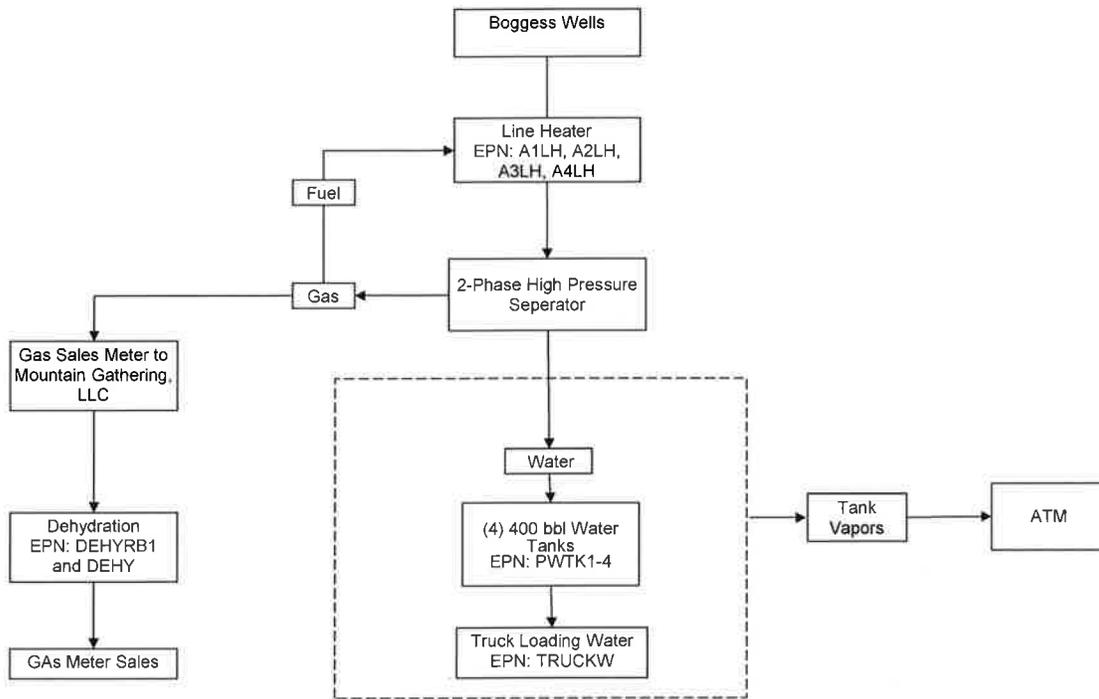
FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants Name/CAS # ¹	Maximum Potential Uncontrolled Emissions ²		Maximum Potential Controlled Emissions ³		Est. Method Used ⁴
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads		N/A	N/A	N/A	N/A	N/A
Unpaved Haul Roads	PM10	3.68	0.73	N/A	N/A	EE – AP42
Loading/Unloading Operations	NMNEVOC	0.01	0.01	N/A	N/A	EE – AP42
Equipment Leaks	NMNEVOC	Does not apply	0.15	Does not apply	N/A	EE – AP42/MB
Blowdown Emissions	NMNEVOC	1.11	0.03	N/A	N/A	MB
Other						

¹ List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. DO NOT LIST H₂, H₂O, N₂, O₂, and Noble Gases.
² Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
³ Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
⁴ Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; M = modeling; O = other (specify).

Attachment D
Process Flow Diagram

XTO Energy, Inc Bogges Well Pad

Process Flow Diagram



Process Description

Associated gas and liquids production from the Bogges Wells flow through a line heater and then to the the 2-phase high pressure separator. The gas is sent to sales. The produced liquids go into four (4) 400 bbl water storage tanks (PWTK1-4) on the site. Some gas is used as fuel for the line heaters to aid in keeping hydrates from freezing in the lines. Water is trucked off site from the storage tanks. Sometimes gas is vented from the equipment to allow for MSS activities. Truck loading emissions include PM emissions for the miles traveled by the loading trucks. Gas sold to Mountain Gathering, LLC. is processed through a dehydrator and then sold via pipeline sales.

Attachment E
Plot Plan

51001-01.02	REV	DATE	DESCRIPTION
EXHIBIT	R03		
03/25/2013	JM1		
XTO ENERGY, INC BOGESS WELL SITE TABLE DISTRICT, HARRISON COUNTY WEST VIRGINIA			
PLOT PLAN			
consulting engineers planners & surveyors			
 METSCH, KUNKEL & ASSOCIATES 1500 Sycamore rd, suite 320 montoursville, pa 17752 570-368-2060 fax 570-368-3786 created: 2013			



LEGEND

- GOVERNMENT BERM
- PRODUCTION LINE
- EXISTING EDGE OF BERM

100' 0 100'

NOTES:

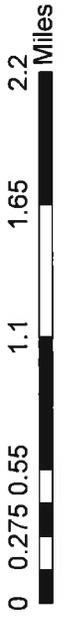
- THIS DRAWING HAS BEEN PREPARED FROM INFORMATION PROVIDED BY THE CLIENT. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED AND FOR THE ACCURACY OF THE INFORMATION SHOWN ON THIS DRAWING. THE ENGINEER HAS CONDUCTED VISUAL INSPECTIONS OF THE PROPERTY AND HAS FOUND NO OTHER DEFECTS OR DEFICIENCIES. THE ENGINEER HAS NOT CONDUCTED ANY OTHER SURVEYING OR MEASUREMENTS AND THEREFORE CANNOT GUARANTEE THE ACCURACY OF THE INFORMATION SHOWN ON THIS DRAWING.

IF SCALE BAR DOES NOT MEASURE 2' DRAWING WAS NOT PLOTTED TO SCALE.

Attachment F
Area Map



Boggess Pad
17S, 552901.85 UTM east, 4358698.93 UTM north
39.376144, -80.385803



1:24,000

• Boggess_Pad





Boggess Pad
 17S, 552901.85 UTM east, 4358698.93 UTM north
 39.376144, -80.385803



1:24,000

• Boggess_Pad



USGS The National Map (Original Horizontal Datum) is derived from the National Geographic Names, Nominative, Administrative, and Topographic Database, National Land Cover Database, National Hydrography Dataset, National Transportation Dataset, USGS Census Bureau TIGER/Line, Road Data, and other sources.

Attachment G
Emission Unit Data Sheets

**General Permit G70-A Registration
 Section Applicability Form**

General Permit G70-A was developed to allow qualified applicants to seek registration for a variety of sources. These sources include natural gas well affected facilities, storage tanks, natural gas-fired compressor engines (RICE), natural gas producing units, natural gas-fired in-line heaters, pneumatic controllers, heater treaters, tank truck loading, glycol dehydration units, completion combustion devices, flares, enclosed combustion devices, and vapor recovery systems. All registered facilities will be subject to Sections 1.0, 2.0, 3.0, and 4.0.

General Permit G70-A allows the registrant to choose which sections of the permit they are seeking registration under. Therefore, please mark which additional sections that you are applying for registration under. If the applicant is seeking registration under multiple sections, please select all that apply. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

Section 5	Natural Gas Well Affected Facility	<input checked="" type="checkbox"/>
Section 6	Storage Vessels*	<input checked="" type="checkbox"/>
Section 7	Gas Producing Units, In-Line Heaters, Heater Treaters, and Glycol Dehydration Reboilers	<input checked="" type="checkbox"/>
Section 8	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO)	<input type="checkbox"/>
Section 9	<i>Reserved</i>	<input type="checkbox"/>
Section 10	Natural gas-fired Compressor Engine(s) (RICE) **	<input type="checkbox"/>
Section 11	Tank Truck Loading Facility ***	<input checked="" type="checkbox"/>
Section 12	Standards of Performance for Storage Vessel Affected Facilities (NSPS, Subpart OOOO)	<input type="checkbox"/>
Section 13	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (NSPS, Subpart JJJJ)	<input type="checkbox"/>
Section 14	Control Devices not subject to NSPS, Subpart OOOO	<input type="checkbox"/>
Section 15	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (40CFR63, Subpart ZZZZ)	<input type="checkbox"/>
Section 16	Glycol Dehydration Units	<input type="checkbox"/>
Section 17	Dehydration Units With Exemption from NESHAP Standard, Subpart HH § 63.764(d) (40CFR63, Subpart HH)	<input checked="" type="checkbox"/>
Section 18	Dehydration Units Subject to NESHAP Standard, Subpart HH and Not Located Within an UA/UC (40CFR63, Subpart HH)	<input type="checkbox"/>
Section 19	Dehydration Units Subject to NESHAP Standard, Subpart HH and Located Within an UA/UC (40CFR63, Subpart HH)	<input type="checkbox"/>

* Applicants that are subject to Section 6 may also be subject to Section 12 if the applicant is subject to the NSPS, Subpart OOOO control requirements or the applicable control device requirements of Section 14.

** Applicants that are subject to Section 10 may also be subject to the applicable RICE requirements of Section 13 and/or Section 15.

*** Applicants that are subject to Section 11 may also be subject to control device requirements of Section 14.

NATURAL GAS WELL AFFECTED FACILITY DATA SHEET

Complete this data sheet if you are the owner or operator of a gas well affected facility for which construction, modification, or reconstruction commenced after August 23, 2011. This form must be completed for natural gas well affected facilities regardless of when flowback operations occur (or have occurred).

Please provide the API number(s) for each NG well at this facility:	
047-033-05509	047-033-05547
047-033-05729	047-033-05843

Note: This is the same API well number(s) provided in the well completion notification and as provided to the WVDEP, Office of Oil and Gas for the well permit. The API number may be provided on the application without the state code (047).

Every oil and gas well permitted in West Virginia since 1929 has been issued an API (American Petroleum Institute) number. This API is used by agencies to identify and track oil and gas wells.

The API number has the following format: 047-001-00001

Where,

047 = State code. The state code for WV is 047.

001 = County Code. County codes are odd numbers, beginning with 001 (Barbour) and continuing to 109 (Wyoming).

00001 = Well number. Each well will have a unique well number.

STORAGE VESSEL EMISSION UNIT DATA SHEET

Provide the following information for each new or modified bulk liquid storage tank.

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name – Four States Pad	2. Tank Name - PWTK1-PWTK4
3. Emission Unit ID number - PWTK1-PWTK4	4. Emission Point ID number - PWTK1-PWTK4
5. Date Installed or Modified (<i>for existing tanks</i>) 2/26/2014	6. Type of change: <input checked="" type="checkbox"/> New construction <input type="checkbox"/> New stored material <input type="checkbox"/> Other
7A. Description of Tank Modification (<i>if applicable</i>)	
7B. Will more than one material be stored in this tank? <i>If so, a separate form must be completed for each material.</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
7C. Provide any limitations on source operation affecting emissions. (production variation, etc.) – 50 BWPD per tank, a total of 200 BWPD	

II. TANK INFORMATION (required)

8. Design Capacity (<i>specify barrels or gallons</i>). Use the internal cross-sectional area multiplied by internal height. 400 bbl	
9A. Tank Internal Diameter (ft.) 12	9B. Tank Internal Height (ft.) 20
10A. Maximum Liquid Height (ft.) 19	10B. Average Liquid Height (ft.) 10
11A. Maximum Vapor Space Height (ft.) 20	11B. Average Vapor Space Height (ft.) 10
12. Nominal Capacity (<i>specify barrels or gallons</i>). This is also known as “working volume. 400 bbl	
13A. Maximum annual throughput (gal/yr) 766,500	13B. Maximum daily throughput (gal/day) 21,000
14. Number of tank turnovers per year 45.30	15. Maximum tank fill rate (gal/min) 14.6
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Is the tank system a variable vapor space system? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe) <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

III. TANK CONSTRUCTION AND OPERATION INFORMATION (*check which one applies*)

<input checked="" type="checkbox"/> Refer to enclosed TANKS Summary Sheets
<input type="checkbox"/> Refer to the responses to items 19 – 26 in section VII

IV. SITE INFORMATION (*check which one applies*)

<input checked="" type="checkbox"/> Refer to enclosed TANKS Summary Sheets
<input type="checkbox"/> Refer to the responses to items 27 – 33 in section VII

G70-A Oil and Natural Gas Production Facilities
 Instructions and Forms

25E. Is the floating roof equipped with a weather shield? <input type="checkbox"/> Yes <input type="checkbox"/> No			
25F. Describe deck fittings:			
26. Complete the following section for Internal Floating Roof Tanks <input type="checkbox"/> Does not apply			
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded		26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: <input type="checkbox"/> 5 ft. wide <input type="checkbox"/> 6 ft. wide <input type="checkbox"/> 7 ft. wide <input type="checkbox"/> 5 x 7.5 ft. wide <input type="checkbox"/> 5 x 12 ft. wide <input type="checkbox"/> other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft ²):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
SITE INFORMATION:			
27. Provide the city and state on which the data in this section are based:			
28. Daily Avg. Ambient Temperature (°F):		29. Annual Avg. Maximum Temperature (°F):	
30. Annual Avg. Minimum Temperature (°F):		31. Avg. Wind Speed (mph):	
32. Annual Avg. Solar Insulation Factor (BTU/ft ² -day):		33. Atmospheric Pressure (psia):	
LIQUID INFORMATION:			
34. Avg. daily temperature range of bulk liquid (°F):	34A. Minimum (°F):	34B. Maximum (°F):	
35. Avg. operating pressure range of tank (psig):	35A. Minimum (psig):	35B. Maximum (psig):	
36A. Minimum liquid surface temperature (°F):		36B. Corresponding vapor pressure (psia):	
37A. Avg. liquid surface temperature (°F):		37B. Corresponding vapor pressure (psia):	
38A. Maximum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
39A. Material name and composition:			
39B. CAS number:			
39C. Liquid density (lb/gal):			
39D. Liquid molecular weight (lb/lb-mole):			
39E. Vapor molecular weight (lb/lb-mole):			
39F. Maximum true vapor pressure (psia):			
39G. Maxim Reid vapor pressure (psia):			
39H. Months Storage per year. From:			
To:			

NATURAL GAS FIRED FUEL BURNING UNITS EMISSION DATA SHEET

Complete the information on this data for each Gas Producing Unit(s), Heater Treater(s), and in-line heater(s) at the production pad. Reboiler information should be entered on the Glycol Dehydration Emission Unit Data Sheet.

Emission Unit ID # ¹	Emission Point ID# ²	Emission Unit Description (Manufacturer / Model #)	Year Installed/ Modified	Type ³ and Date of Change	Control Device ⁴	Design Heat Input (mmBtu/hr) ⁵	Fuel Heating Value (Btu/scf) ⁶
A1LH	A1LH	Energy Weld Line Heater	2015	New	N/A	0.5	1026
A2LH	A2LH	Energy Weld Line Heater	2014	New	N/A	0.5	1026
A3LH	A3LH	Energy Weld Line Heater	2015	New	N/A	0.5	1026
A4LH	A4LH	Energy Weld Line Heater	2015	New	N/A	0.5	1026

¹ Enter the appropriate Emission Unit (or Sources) identification numbers for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For sources, use 1S, 2S, 3S...or other appropriate designation. Enter glycol dehydration unit Reboiler Vent data on the *Glycol Dehydration Unit Data Sheet*.

² Enter the appropriate Emission Point identification numbers for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For emission points, use 1E, 2E, 3E...or other appropriate designation.

³ New, modification, removal

⁴ Complete appropriate air pollution control device sheet for any control device.

⁵ Enter design heat input capacity in mmBtu/hr.

⁶ Enter the fuel heating value in Btu/standard cubic foot.

GLYCOL DEHYDRATION EMISSION UNIT DATA SHEET

General Glycol Dehydration Unit Data		Manufacturer and Model		JATCO	
		Max Dry Gas Flow Rate (mmscf/day)		20.0	
		Design Heat Input (mmBtu/hr)		1.0	
		Design Type (DEG or TEG)		TEG	
		Source Status ²		NS	
		Date Installed/Modified/Removed ³		6/30/15	
		Regenerator Still Vent APCD ⁴		NA	
		Control Device ID ⁴		NA	
		Fuel HV (Btu/scf)		1026	
		H ₂ S Content (gr/100 scf)		0	
		Operation (hrs/yr)		8760	
Emission Unit ID/ Emission Point ID ¹	Vent	Reference ⁵	Potential Emissions ⁶	lbs/hr	tons/yr
DEHYRB1	Reboiler Vent	AP	NO _x	0.097	0.427
		AP	CO	0.082	0.359
		AP	VOC	0.005	0.023
		AP	SO ₂	0.001	0.003
		AP	PM ₁₀	0.007	0.032
DEHY	Glycol Regenerator Still Vent	GRI-GLYCalc™	VOC	0.362	1.586
		GRI-GLYCalc™	Benzene	0.00	0.00
		GRI-GLYCalc™	Ethylbenzene	0.00	0.00
		GRI-GLYCalc™	Toluene	0.00	0.00
		GRI-GLYCalc™	Xylenes	0.00	0.00
		GRI-GLYCalc™	n-Hexane	0.00	0.00

1. Enter the appropriate Emission Unit ID Numbers and Emission Point ID Numbers for the glycol dehydration unit reboiler vent and glycol regenerator still vent. The glycol dehydration unit reboiler vent and glycol regenerator still vent should be designated RBV-1 and RSV-1, respectively. If the compressor station incorporates multiple glycol dehydration units, a *Glycol Dehydration Emission Unit Data Sheet* shall be completed for each, using Source Identification #s RBV-2 and RSV-2, RBV-3 and RSV-3, etc.
2. Enter the Source Status using the following codes:

NS	Construction of New Source	ES	Existing Source
MS	Modification of Existing Source	RS	Removal of Source
3. Enter the date (or anticipated date) of the glycol dehydration unit's installation (construction of source), modification or removal.

4. Enter the Air Pollution Control Device (APCD) type designation using the following codes and the control device ID number:

- | | | | |
|----|------------------|----|----------------------------------|
| NA | None | CD | Condenser |
| FL | Flare | CC | Condenser/Combustion Combination |
| TO | Thermal Oxidizer | | |

5. Enter the Potential Emissions Data Reference designation using the following codes:

- | | | | | |
|----|---------------------|----|-------------|---------------|
| MD | Manufacturer's Data | AP | AP-42 | |
| GR | GRI-GLYCalc™ | OT | Other _____ | (please list) |

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

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

TANK TRUCK LOADING EMISSION UNIT DATA SHEET

*Furnish the following information for each new or modified bulk liquid transfer area or loading rack at the natural gas production pad.
 This form is to be used for bulk liquid transfer operations to tank trucks.*

1. Emission Unit ID: - TRUCKW	2. Emission Point ID: - TRUCKW	3. Year Installed/ Modified: 2015		
4. Emission Unit Description: Truck Loading of produced water				
5. Loading Area Data:				
5A. Number of pumps: 1	5B. Number of liquids loaded: 1	5C. Maximum number of tank trucks loading at one time: 1		
6. Describe cleaning location, compounds and procedure for tank trucks: Trucks will enter the site via a gravel road and hook up to the loading rack. The trucks will receive roughly 180 bbls of produced water. The trucks will then exit the site via the same gravel road.				
7. Are tank trucks pressure tested for leaks at this or any other location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If YES, describe:				
8. Projected Maximum Operating Schedule (for rack or transfer point as a whole):				
Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	24	24	24	24
days/week	7	7	7	7

9. Bulk Liquid Data <i>(add pages as necessary)</i> :			
Liquid Name	Produced Water		
Max. daily throughput (1000 gal/day)	67.2		
Max. annual throughput (1000 gal/yr)	730.0		
Loading Method ¹	BF		
Max. Fill Rate (gal/min)	126		
Average Fill Time (min/loading)	60		
Max. Bulk Liquid Temperature (°F)	80.0		
True Vapor Pressure ²	0.39		
Cargo Vessel Condition ³	U		
Control Equipment or Method ⁴	N/A		
Minimum collection efficiency (%)	N/A		
Minimum control efficiency (%)	N/A		

* Continued on next page

G70-A Oil and Natural Gas Production Facilities
 Instructions and Forms

Maximum Emission Rate	Loading (lb/hr)	0.76		
	Annual (ton/yr)	0.15		
Estimation Method ⁵		EPA		
Notes:				
¹ BF = Bottom Fill SP = Splash Fill SUB = Submerged Fill				
² At maximum bulk liquid temperature				
³ B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)				
⁴ List as many as apply (complete and submit appropriate <i>Air Pollution Control Device Sheets as Attachment "H"</i>): CA = Carbon Adsorption VB = Dedicated Vapor Balance (closed system) ECD = Enclosed Combustion Device F = Flare TO = Thermal Oxidation or Incineration				
⁵ EPA = EPA Emission Factor as stated in AP-42 MB = Material Balance TM = Test Measurement based upon test data submittal O = other (describe)				

10. Proposed Monitoring, Recordkeeping, Reporting, and Testing	
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.	
MONITORING <i>Because there is no control device and produced water is being loaded, no monitoring should be needed for produced water truck loading.</i>	RECORDKEEPING <i>Records of the annual throughput through the facility and the run tickets will be kept.</i>
REPORTING <i>N/A</i>	TESTING <i>N/A</i>
11. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty: N/A	

Attachment H
Air Pollution Control Device Data Sheet

Air Pollution Control Device Data Sheet

**Bogges Well Pad
Harrison County, West Virginia
XTO Energy, Inc.**

There is no air pollution control devices located at the facility, and therefore no data sheets are submitted with this application.

Attachment I
Emission Calculations

XTO Energy, Inc.
Bogges Well Pad
Facility Emission Summary

Emissions Summary Table

Emission Source	FIN	EPN	NOx		CO		Total VOC (Includes Total HAPs)		SO ₂		PM _{10 & 2.5}		Total HAPs	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Truck Loading/ Produced Water	TRUCKIV	TRUCKW	*	*	*	*	0.7568	0.1493	*	*	*	*	0.0000	0.0002
Fugitive Emissions: Equipment Leaks & Truck Loading Dust Emissions	FUG	FUG	*	*	*	*	0.0350	0.1535	*	*	3.6771	0.7255	0.0000	0.0000
Equipment Blowdowns/ MSS	EQUIP BD	BD VENT	*	*	*	*	1.1130	0.0278	*	*	*	*	0.0000	0.0000
Line Heater	A1LH	A1LH	0.0487	0.2135	0.0409	0.1793	0.0027	0.0117	0.0003	0.0013	0.0037	0.0162	0.0009	0.0040
Line Heater	A2LH	A2LH	0.0487	0.2135	0.0409	0.1793	0.0027	0.0117	0.0003	0.0013	0.0037	0.0162	0.0009	0.0040
Line Heater	A3LH	A3LH	0.0487	0.2135	0.0409	0.1793	0.0027	0.0117	0.0003	0.0013	0.0037	0.0162	0.0009	0.0040
Line Heater	A4LH	A4LH	0.0487	0.2135	0.0409	0.1793	0.0027	0.0117	0.0003	0.0013	0.0037	0.0162	0.0009	0.0040
Dehy Reboiler 1.0 MMBTU/hr	DEHYR01	DEHYR01	0.0975	0.4269	0.0819	0.3586	0.0054	0.0235	0.0006	0.0026	0.0074	0.0324	0.0018	0.0080
TEG Dehy	DEHY	DEHY	*	*	*	*	0.3621	1.5858	*	*	*	*	0.0000	0.0000
Produced Water Tank: 400 bbl	PWTK1	PWTK1	*	*	*	*	0.0233	0.1013	*	*	*	*	0.0000	0.0001
Produced Water Tank: 400 bbl	PWTK2	PWTK2	*	*	*	*	0.0233	0.1013	*	*	*	*	0.0000	0.0000
Produced Water Tank: 400 bbl	PWTK3	PWTK3	*	*	*	*	0.0233	0.1013	*	*	*	*	0.0000	0.0000
Produced Water Tank: 400 bbl	PWTK4	PWTK4	*	*	*	*	0.0233	0.1013	*	*	*	*	0.0000	0.0000

TOTAL EMISSIONS	NOx		CO		Total VOC (Includes Total HAPs)		SO ₂		PM _{10 & 2.5}		Total HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
	0.2924	1.2807	0.2456	1.0758	2.3760	2.3919	0.0018	0.0077	3.6993	0.8228	0.0056	0.0244

XTO Energy, Inc.
Bogges Well Pad
Gas Analysis - Representative

Conversion of Mole Percent to Weight Percent

Component	Mole %	MW	Mole % *MW	Weight %
Carbon Dioxide	0.159	44.01	0.0699	0.418%
Nitrogen	0.287	28.01	0.0805	0.480%
Hydrogen Sulfide	0.000	34.08	0.0000	0.000%
Methane	95.428	16.04	15.3086	91.391%
Ethane	3.823	30.07	1.1496	6.863%
Propane	0.272	44.10	0.1201	0.717%
Iso-Butane	0.015	58.12	0.0087	0.052%
N-Butane	0.019	58.12	0.0109	0.065%
Iso-Pentane	0.002	72.15	0.0014	0.008%
N-Pentane	0.001	72.15	0.0009	0.005%
n-Hexane	0.000	86.18	0.0000	0.000%
Hexanes	0.000	86.16	0.0000	0.000%
2,4-Dimethylpentane	0.000	114.24	0.0000	0.000%
Methycyclohexane	0.000	96.00	0.0000	0.000%
Benzene*	0.000	78.11	0.0000	0.000%
Cyclohexane	0.000	84.51	0.0000	0.000%
Heptanes	0.000	100.20	0.0000	0.000%
Toluene	0.000	92.13	0.0000	0.000%
Ethylbenzene	0.000	106.17	0.0000	0.000%
Xylenes	0.000	106.17	0.0000	0.000%
Octanes	0.000	114.23	0.0000	0.000%
Nonanes	0.000	128.28	0.0000	0.000%
Decanes+	0.000	155.00	0.0000	0.000%
Total	100.007	-	16.75	100.000%

Molecular Weight	16.75	
Relative Density	0.58	
Lower Heating Value	1026	
NMHC	1.2916	7.711%
VOCs (NMNEHC)	0.1420	0.848%
HAPs	0.0000	0.000%
Total HC	16.6002	99.102%
THC:VOC Ratio	0.8555	0.855%

* All Hexane+ ran as Benzene to be conservative

XTO Energy, Inc.
Boggess Well Pad
Fugitive Emissions - VOC

Fugitive Emission Calculations

Component Type	Service	Estimated Components Count	Hours	Factors	Total VOC Weight %	Emissions	
						lb/year	tons/year
Valves	Gas/Vapor	120	8760	0.00992000	0.85%	88.4065	0.0442
	Light Oil		8760	0.00550000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00001900	10.00%	0.0000	0.0000
	Water/Light Oil	100	8760	0.00021600	10.00%	18.9216	0.0095
Pumps	Gas/Vapor		8760	0.00529000	0.85%	0.0000	0.0000
	Light Oil		8760	0.02866000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00113000	10.00%	0.0000	0.0000
	Water/Light Oil	2	8760	0.00005300	10.00%	0.0929	0.0000
Flanges	Gas/Vapor	200	8760	0.00086000	0.85%	12.7738	0.0064
	Light Oil		8760	0.00024300	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00000086	10.00%	0.0000	0.0000
	Water/Light Oil	200	8760	0.00000620	10.00%	1.0862	0.0005
Open-ended Lines	Gas/Vapor	4	8760	0.00441000	0.85%	1.3101	0.0007
	Light Oil		8760	0.00309000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00030900	10.00%	0.0000	0.0000
	Water/Light Oil	8	8760	0.00055000	10.00%	3.8544	0.0019
Connectors	Gas/Vapor	160	8760	0.00044000	0.85%	5.2283	0.0026
	Light Oil		8760	0.00046300	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00001700	10.00%	0.0000	0.0000
	Water/Light Oil	120	8760	0.00024300	10.00%	25.5442	0.0128
Other:	Gas/Vapor	10	8760	0.01940000	0.85%	14.4076	0.0072
	Light Oil		8760	0.01650000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00006800	10.00%	0.0000	0.0000
	Water/Light Oil	5	8760	0.03090000	10.00%	135.3420	0.0677

Total VOC Emissions	lb/hr	lb/year	TPY
		0.035	306.968
HAPs	0.000	0.000	0.000

XTO Energy, Inc.

Bogges Well Pad

Line Heater Burner Calculations

CRITERIA & REGULATED POLLUTANTS

EPN	Fuel Gas (BTU/SCF)	Operating Hours	Burner Rating (MMBTU/Hr)	AP-42 Factors lb/MMSCF						lb/hr						tpy					
				NOx	CO	VOC	SO ₂	PM _{10.2.5}	PM _{10.2.5}	NOx	CO	VOC	SO ₂	PM _{10.2.5}	PM _{10.2.5}	NOx	CO	VOC	SO ₂	PM _{10.2.5}	PM _{10.2.5}
A1LH	1026.0	8760	0.50	100	84	5.5	0.6	7.6	0.049	0.041	0.003	0.000	0.004	0.213	0.179	0.012	0.001	0.016	0.016		
A2LH	1026.0	8760	0.50	100	84	5.5	0.6	7.6	0.049	0.041	0.003	0.000	0.004	0.213	0.179	0.012	0.001	0.016	0.016		
A3LH	1026.0	8760	0.50	100	84	5.5	0.6	7.6	0.049	0.041	0.003	0.000	0.004	0.213	0.179	0.012	0.001	0.016	0.016		
A7LH	1026.0	8760	0.50	100	84	5.5	0.6	7.6	0.049	0.041	0.003	0.000	0.004	0.213	0.179	0.012	0.001	0.016	0.016		
DEHYR1	1026.0	8760	1.00	100	84	5.5	0.6	7.6	0.087	0.082	0.005	0.001	0.007	0.427	0.359	0.023	0.003	0.032	0.032		

*Source: AP-42 Table 1.4-1, 1.4-2, & 1.4-3

Total (tpy)		NOx	CO	VOC	SO ₂	PM _{10.2.5}
		1.281	1.076	0.070	0.008	0.097

XTO Energy, Inc.
Bogges Well Pad
Line Heater Burner Calculations

HAZARDOUS AIR POLLUTANTS (HAPS)

EPN	Fuel Gas (BTU/SCF)	Operating Hours	Burner Rating (MMBTU/Hr)	AP-42 Factors lb/MMSCF						lb/hr								
				Benzene	Toluene	N-Hexane	HCHO	Dichlorobenz.	Benzene	Toluene	N-Hexane	HCHO	Dichlorobenz.	Benzene	Toluene	N-Hexane	HCHO	Dichlorobenz
A1LH	1026	8760	0.500	0.0021	0.0034	1.8	0.0750	0.0012	0.000001	0.000002	0.000877	0.000037	0.000001	0.000004	0.000007	0.003842	0.000160	0.000003
A2LH	1026	8760	0.500	0.0021	0.0034	1.8	0.0750	0.0012	0.000001	0.000002	0.000877	0.000037	0.000001	0.000004	0.000007	0.003842	0.000160	0.000003
A3LH	1026	8760	0.500	0.0021	0.0034	1.8	0.0750	0.0012	0.000001	0.000002	0.000877	0.000037	0.000001	0.000004	0.000007	0.003842	0.000160	0.000003
A4LH	1026	8760	0.500	0.0021	0.0034	1.8	0.0750	0.0012	0.000001	0.000002	0.000877	0.000037	0.000001	0.000004	0.000007	0.003842	0.000160	0.000003
DEHYRB1	1026	8760	1.000	0.0021	0.0034	1.8	0.0750	0.0012	0.000002	0.000003	0.001754	0.000073	0.000001	0.000009	0.000015	0.007684	0.000320	0.000005

*Source: AP-42 Table 1.4-1, 1.4-2, & 1.4-3

Total Individual HAPS (tpy)		Benzene	Toluene	Hexane	HCHO	Dichlorobenz.
		0.000027	0.000044	0.023063	0.000961	0.000015

Total Combined HAPS (tpy)	0.02410
----------------------------------	----------------

XTO Energy, Inc.
Bogges Well Pad
Dehydrator #1: Total Emission Summary

Dehy Emissions: MACT HH Verification

Emission Component	Still Column Emissions (Controlled - BTEX Condenser)		Flash Tank Emissions (Fuel for Burner)		Total Combined Dehy Emissions (Flash Tank & Still Column - Controlled)	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Propane	0.0866	0.3791	0.1818	0.7963	0.2684	1.1754
Iso-Butane	0.0140	0.0613	0.0159	0.0698	0.0299	0.1311
N-Butane	0.0284	0.1243	0.0226	0.0990	0.0510	0.2233
Iso-Pentane	0.0048	0.0210	0.0029	0.0127	0.0077	0.0337
N-Pentane	0.0035	0.0154	0.0016	0.0069	0.0051	0.0223
n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hexane +	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ethylbenzene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Xylenes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Octanes+	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TOTAL EMISSION SUMMARY

Emission Component	lb/hr	TPY
NMNEVOC (Includes TOTAL HAPs)	0.3621	1.5858
TOTAL HAPs	0.0000	0.0000

HAP Emission Components

HAP Emission Components	lb/hr	TPY
Benzene	0.0000	0.0000
Toluene	0.0000	0.0000

XTO Energy, Inc.
Boggess Well Pad
Dehydrator # 1: Flash Tank - Emission Summary

Dehy Flash Tank Emissions

Emission Component	Uncontrolled Flash Tank		Controlled Flash Tank	
	lb/hr	TPY	lb/hr	TPY
Propane	0.1818	0.7963	0.1818	0.7963
Iso-Butane	0.0159	0.0698	0.0159	0.0698
N-Butane	0.0226	0.0990	0.0226	0.0990
Iso-Pentane	0.0029	0.0127	0.0029	0.0127
N-Pentane	0.0016	0.0069	0.0016	0.0069
n-Hexane	0.0000	0.0000	0.0000	0.0000
Hexane +	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0000	0.0000	0.0000
Ethylbenzene	0.0000	0.0000	0.0000	0.0000
Xylenes	0.0000	0.0000	0.0000	0.0000
Octanes+	0.0000	0.0000	0.0000	0.0000

TOTAL EMISSION SUMMARY - CONTROLLED

Emission Component	lb/hr	TPY
NMNEVOC (Includes TOTAL HAPs)	0.2248	0.9847
TOTAL HAPs	0.0000	0.0000

*Uncontrolled Emissions Based off of Gri-GlyCalc Output

*Controlled Emissions Were Calculated by the Following: Uncontrolled Emissions * (1-Burner Efficiency)

Burner Reduction = 0%

Conversion from H₂S to SO₂:

$$\text{H}_2\text{S Mass Rate (TPY)} * \text{SO}_2 \text{ Conversion Efficiency} * (\text{MW of SO}_2 \text{ (lb/lb-mol)} / \text{MW of H}_2\text{S (lb/lb-mol)})$$

XTO Energy, Inc.
Bogges Well Pad
Produced Water Storage Tanks

Emissions Calculations - Total Tank Emissions

Average BWPD	Number of Produced Water Tanks	Emissions Controlled (Yes/No)	Control Type (Flare, VRU, etc.)
200	4	No	N/A

Total Uncontrolled Emissions - Emission Rate for All Tanks Combined			
Uncontrolled VOC Emissions		Uncontrolled HAP Emissions	
0.093	lb/hr	0.000	lb/hr
0.405	tpy	0.001	tpy

Total Uncontrolled Emissions - Emission Rates Per Tank			
Uncontrolled VOC Emissions		Uncontrolled HAP Emissions	
0.023	lb/hr	0.000	lb/hr
0.101	tpy	0.000	tpy

Tank Emissions are based from Tanks 4.09d calculations & Flash GOR (both use a 100% additional safety factor)

XTO Energy, Inc.
Bogges Well Pad
Tank Vapor Analysis - Representative

Conversion of Mole Percent to Weight Percent

Component	Mole %	MW	Mole % *MW	Weight %
Carbon Dioxide	1.5529	44.0100	0.6834	0.2247
Nitrogen	1.2181	28.0100	0.3412	0.0002
Hydrogen Sulfide	0.0000	34.0800	0.0000	0.0000
Helium	0.0000	4.0000	0.0000	0.0000
Methane	88.8214	16.0400	14.2470	0.3167
Ethane	7.3093	30.0700	2.1979	0.3100
Propane	0.9392	44.1000	0.4142	0.0440
Iso-Butane	0.0300	58.1200	0.0174	0.0017
N-Butane	0.0130	58.1200	0.0076	0.0012
Iso-Pentane	0.0021	72.1500	0.0015	0.0000
N-Pentane	0.0010	72.1500	0.0007	0.0000
Methylcyclopentane	0.0000	86.0000	0.0000	0.0000
n-Hexane	0.0014	86.1800	0.0012	0.0000
Hexane +	0.0041	86.1600	0.0035	0.0000
2,2,4-Trimethylpentane	0.0000	114.2400	0.0000	0.0000
Methylcyclohexane	0.0000	96.0000	0.0000	0.0000
Benzene	0.0160	78.1100	0.0125	0.0002
Cyclohexane	0.0102	84.0000	0.0086	0.0000
Heptanes	0.0080	100.2000	0.0080	0.0671
Toluene	0.0397	92.1300	0.0366	0.0000
Ethylbenzene	0.0039	106.1700	0.0041	0.0000
Xylenes	0.0160	106.1700	0.0170	0.0000
Octanes+	0.0116	114.2300	0.0133	0.0241
Nonanes+	0.0014	128.2800	0.0018	0.0099
Decanes+	0.0000	155.7100	0.0000	0.0004
Total	99.999	-	18.0175	100.000%

Molecular Weight	18.02	
Specific Gravity	0.721	
Gross WET BTU	1037	
NMHC	2.7459	45.843%
VOCs (NMNEHC)	0.5480	14.846%
HAPs	0.0714	0.02%
H2S Mole Fraction	0.0000	0.000%
Total HC	16.9928	77.512%
THC:VOC Ratio	3.2248	3.225%

XTO Energy, Inc.
Bogges Well Pad
Production Tank Vapors

Oil/Condensate Production	0	BOPD
Produced Water Production	200	BWPD
E&P Tanks Output - Gas-to-Oil Ratio*	1.78	SCF / Barrel (GOR)
Quantity Released	71.2	(BOPD * GOR) + (BWPD * GOR * 0.2)
Duration	24	Hours/Day
Flared	No	(Yes/No)
Vented	Yes	(Yes/No)
BTU	1037	

Component	Estimated Quantity Vented (lb/day)	Estimated Quantity Emitted from the Flare (lb/day)	Total Estimated Quantity Emitted (lb/day)	Hourly Emission Rate (lb/hr)	Annualized Emission Rate (TPY)
Carbon Monoxide	0.000	0.000	0.000	0.000	0.000
NOx	0.000	0.000	0.000	0.000	0.000
Total VOCs	0.010	0.000	0.010	0.000	0.002
Total HAPs	0.000	0.001	0.001	0.000	0.000
Sulfur Dioxide	0.000	0.000	0.000	0.000	0.000
Carbon Dioxide	0.748	0.000	0.748	0.031	0.136
Nitrogen	0.001	0.000	0.001	0.000	0.000
Hydrogen Sulfide	0.000	0.000	0.000	0.000	0.0000
Helium	0.000	0.000	0.000	0.000	0.000
Methane	1.054	0.000	1.054	0.044	0.192
Ethane	1.032	0.000	1.032	0.043	0.188
Propane	0.146	0.000	0.146	0.006	0.027
Iso-Butane	0.006	0.000	0.006	0.000	0.001
N-Butane	0.004	0.000	0.004	0.000	0.001
Iso-Pentane	0.000	0.000	0.000	0.000	0.000
N-Pentane	0.000	0.000	0.000	0.000	0.000
Methylcyclopentane	0.000	0.000	0.000	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	0.000
Hexanes	0.000	0.000	0.000	0.000	0.000
2,4-Dimethylpentane	0.000	0.000	0.000	0.000	0.000
Methylcyclohexane	0.000	0.000	0.000	0.000	0.000
Benzene	0.001	0.000	0.001	0.000	0.000
Cyclohexane	0.000	0.000	0.000	0.000	0.000
Heptanes	0.223	0.000	0.223	0.009	0.041
Toluene	0.000	0.000	0.000	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	0.000
Xylenes	0.000	0.000	0.000	0.000	0.000
Octanes	0.080	0.000	0.080	0.003	0.015
Nonanes	0.033	0.000	0.033	0.001	0.006
Decanes+	0.001	0.000	0.001	0.000	0.000
PM _{10 & 2.5}	0.000	0.000	0.000	0.000	0.000

XTO Energy, Inc.
Bogges Well Pad
PRODUCED WATER TRUCK LOADING EMISSIONS

Truck Loading Losses Calculations

Produced Water Production:	200	bbls / Day
Operating Schedule	365	Day / Year
Total Production:	73000	bbls / Year

LL= 12.46 * SPM/T * (1-EFF/100)	
Saturation Factor (S) =	0.6
True Vapor Pressure of liquid loaded (P) =	0.39
Temperature of bulk liquid loaded in Rankin (T) =	540.0
Molecular Weight (M) ¹ =	18.02
Control Efficiency * Collection Efficiency (EFF)=	0
LL (lb Total HC / bbl Throughput) =	0.0041
Estimated Throughput (bbls/Year) =	73000
Truck Loading Rate (bbls/hour) =	185
Estimated # of Loads (Approximately 1 hr/Load) =	395

Total VOC Emissions	lb/hr	TPY
	0.76	0.15

¹Molecular Weight and VP is from Tanks 4.09 d report

XTO Energy, Inc.
Boggess Well Pad
MSS Gas Analysis

Conversion of Mole Percent to Weight Percent

Component	Mole %	MW	Mole % *MW	Weight %
Carbon Dioxide	0.1589	44.0150	0.0699	0.418%
Nitrogen	0.2872	28.0137	0.0805	0.480%
Hydrogen Sulfide	0.0000	34.0800	0.0000	0.000%
Methane	95.4281	16.0420	15.3086	91.391%
Ethane	3.8233	30.0685	1.1496	6.863%
Propane	0.2724	44.1000	0.1201	0.717%
Iso-Butane	0.0150	58.1200	0.0087	0.052%
N-Butane	0.0188	58.1200	0.0109	0.065%
Iso-Pentane	0.0019	72.1500	0.0014	0.008%
N-Pentane	0.0012	72.1517	0.0009	0.005%
n-Hexane	0.0000	86.1800	0.0000	0.000%
Hexane +	0.0000	86.1600	0.0000	0.000%
2,4-Dimethylpentane	0.0000	114.2400	0.0000	0.000%
Methylcyclohexane	0.0000	96.0000	0.0000	0.000%
Benzene	0.0000	78.1100	0.0000	0.000%
Cyclohexane	0.0000	84.5062	0.0000	0.000%
Heptanes	0.0000	100.2000	0.0000	0.000%
Toluene	0.0000	92.1300	0.0000	0.000%
Ethylbenzene	0.0000	106.1700	0.0000	0.000%
Xylenes	0.0000	106.1700	0.0000	0.000%
Octanes+	0.0000	114.2300	0.0000	0.000%
Nonanes+	0.0000	128.2800	0.0000	0.000%
Decanes+	0.0000	155.0000	0.0000	0.000%
Total	100.01	-	-	100.000%

Molecular Weight	16.75	
Specific Gravity	0.58	
Gross WET BTU	1026	
NMHC	1.2916	7.711%
VOCs (NMNEHC)	0.1420	0.848%
HAPs	0.0000	0.00%
H2S Mole Fraction	0.0000	0.000%
Total HC	16.6002	99.102%
THC:VOC Ratio	0.8555	0.855%

XTO Energy, Inc.
Bogges Well Pad
Equipment Blowdowns & Purging Emissions

Equipment Blowdowns & Purging - Emission Calculations

Vessel Information - (Basis for Volume: Compressor Discharge Filter Separator)		
Volume of the Vessels	75.40	ft ³
Estimated Volume of Gas in Vessel Under Pressure ¹	1101.22	Standard ft ³
Vessel Pressure	200	psig
Vessel Pressure	214.7	psia
Vessel / Atmospheric Temperature	80	°F
Vessel / Atmospheric Temperature	540	°R

Gas Composition Information		
Atmospheric Pressure	14.7	Psia
Universal Gas Constant (R)	10.73	ft ³ psi/°R lb-mol
Molecular Weight	16.75	lb/lb-mole
Compressibility Factor	0.9962	Z
VOC Weight Percent	0.85%	Percentage
HAP Weight Percent	0.00%	Percentage
H ₂ S Weight Percent	0.00%	Percentage
Ending Gas Density (ρ_2) ²	0.0427	lb/ft ³
Starting Gas Density (ρ_1) ³	0.6230	lb/ft ³
Density (ρ_{TOTAL}) ⁴	0.5804	lb/ft ³

Emission Calculations		
Density (ρ_{TOTAL})	0.5804	lb/ft ³
Estimated Max Amount of Gas Vented ⁵	43.76	lbs/Event
Estimated Number of Equipment Blowdowns	50	Events/Year
Estimated Equipment Purge Count	3	Times/Event
Estimated Total Amount of Gas Released (Includes Methane & Ethane)	6564.07	lbs/Year
Estimated Total Amount of Gas Released (Includes Methane & Ethane)	3.28	Tons/Year

Estimated Total Emissions		
Total VOC Emissions (Includes Total HAPs)	55.65	lbs/Year
	1.11	lbs/Event
	0.03	Tons/Year
Total HAPs Emissions	0.00	lbs/Year
	0.00	lbs/Event
	0.000	Tons/Year

Calculation Methodology		
¹ Ideal Gas Law - Constant Temp: $(V_1 * P_1) / P_2$	² $\rho_1 = (P_1 * MW) / R * T_1 * Z$	³ $\rho_2 = (P_2 * MW) / R * T_2 * Z$
⁴ $\rho_{TOTAL} = \rho_1 - \rho_2$	⁵ Estimated Max Gas Vented (lb/Event) = $\rho_{TOTAL} * V_1$	

Mountain Gathering, LLC
Homer City PP Compressor Station
Truck Loading Dust Emissions

Truck Loading Losses Calculations

# of Truck Loads	395	Year
Total miles traveled per load	1	Mile

$$E = k(s/12)^a(w/3)^b$$

empirical constant for PM ₁₀ (k) =	1.5
surface material silt content (s) =	8.90
empirical constant for PM ₁₀ (a) =	0.9
mean vehicle weight (tons) (w) =	40.00
empirical constant for PM ₁₀ (b) =	0.45
lbs per vehicle mile traveled (E) =	3.6771
lbs for total vehicle miles traveled per year =	1450.95

Total PM Emissions	lb/hr	TPY
	3.68	0.73

*AP-42 Chapter 13.2.2-2 equation (1a) for unpaved surfaces at industrial sites

Attachment J
Class I Legal Advertisement

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that XTO Energy, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a General Permit Registration for a Class II Oil and Natural Gas Production Facility located on Reses Run Rd, near Lumberton in Harrison County, West Virginia. The latitude and longitude coordinates are: 39.376144, -80.385803.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: 1.2807 TPY NO_x, 1.0758 TPY CO, 2.3919 TPY VOC, 0.0077 TPY SO₂, 0.8228 TPY PM, 0.0244 TPY HAPs).

Startup of operation is planned to begin on or about the 30 day of June, 2015. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the 15st day of April, 2015.

By: XTO Energy, Inc.
Michael Johnson
VP – Production Operations Appalachia
502 Keystone Drive
Warrendale, PA 15086

- *This Legal Notice was run in the Exponent/Telegram on April 15, 2015.*

Attachment K
Electronic Submittal

Electronic Submittal

**Bogges Well Pad
Harrison County, West Virginia
XTO Energy, Inc.**

A CD with the PDF of the application is attached to this submittal.

Attachment L
Application Fee

100046056

Mountain Gathering, LLC Fort Worth, Texas 76102-6298

817-885-2195

INVOICE NUMBER / DESCRIPTION	INVOICE DATE	INVOICE AMOUNT
CK REQ 04042015A WV PERMIT FEES BOGGESS COMPRES	4/09/2015	1,500.00

VENDOR NUMBER 8009190	VENDOR NAME WEST VIRGINIA DEPARTMENT OF	CHECK NUMBER 0000018075	CHECK TOTAL \$1,500.00
--------------------------	--	----------------------------	---------------------------

REMITTANCE ADVICE PLEASE DETACH STUB BEFORE DEPOSITING CHECK

THE ORIGINAL DOCUMENT HAS A WHITE REFLECTIVE WATERMARK ON THE BACK. HOLD AT AN ANGLE TO VIEW. DO NOT CASH IF NOT PRESENT.



Mountain Gathering, LLC
810 Houston St Fort Worth, Texas 76102-6298

Bank of America, N.A.
Dallas, Texas
64-1278/611

CHECK DATE	CHECK NO.
4/16/15	0000018075

AMOUNT
\$1,500.00

PAY ONE THOUSAND FIVE HUNDRED DOLLARS AND ZERO CENTS

000006 041615

VOID AFTER 90 DAYS
VENDOR

TO THE
ORDER OF

WEST VIRGINIA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
601 57TH STREET, S.E.
CHARLESTON, WV 25304-2345

Evan M Van Kirk

AUTHORIZED SIGNATURE

⑈0000018075⑈ ⑆061112788⑆

3359169508⑈

FORM NO. XTO AP IN-HOUSE CHECK

Attachment M
Siting Criteria Waiver

Siting Criteria Waiver

**Bogges Well Pad
Harrison County, West Virginia
XTO Energy, Inc.**

A Siting Criteria Waiver is not required for this application. The facility is greater than 300 feet from the nearest receptor.

Attachment N
Material Safety Data Sheets

MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)



Revision Date: February 05, 2015

Supersedes Date: January 26, 2012

Section 1: PRODUCT AND COMPANY IDENTIFICATION

FortisBC
16705 Fraser Highway
Surrey, BC
V3S 2X7

Company Phone Number: (604) 576-7000
Emergency Phone Number: 1-800-663-9911

Product Name: Natural Gas (Pipeline Quality)
Material Use: Fuel

Manufacturer: Duke Energy Inc.
1333 West Georgia Street
Vancouver, BC
V6E 3K9

Supplier: FortisBC
16705 Fraser Highway
Surrey, BC
V3S 2X7

WHMIS Class: A – Compressed Gas;
B1 – Flammable and Combustible Material – Division 1 Flammable Gases
UN/PIN Number: 1971
TDG Classification: Class 2.1 Flammable Gases
TDG Shipping Name: Natural gas, compressed with high methane content
Chemical Family: Simple hydrocarbon
Chemical Formula: Natural gas (considered a complex mixture)
Molecular Weight: Not applicable (natural gas is considered a complex mixture)
CAS Number: 8006-14-2
Trade Names / Synonyms: Methane, marsh gas

Section 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance/Odour: Gas like odour and colourless gas
Flammable: Yes. Can cause flash fire
Potential Health Effects: See Section 11 for more information
Potential Environmental Effects: See Section 12 for more information
Likely Routes of Exposure: Acute inhalation
Acute Inhalation: At high concentrations, natural gas can displace oxygen causing asphyxiation and cause central nervous system (CNS) depression and cardiac sensitization.
Eye and Skin Contact: None
Chronic- Inhalation: None
Ingestion: None
Skin Adsorption: None

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS #	% by Wt.	Exposure Limits ^{NOTE 1}
Methane	74-82-8	95	Simple asphyxiant
Ethane	74-84-0	3	Simple asphyxiant
Propane	74-98-6	1	Simple asphyxiant
Inert Gas	Not available	<1	Not available
Sulphur Compounds	Not available	Trace	Not available
Mercaptan Odourant	Mixture	3 ppm	0.5 ppm (ethyl mercaptan) 0.5 ppm (methyl mercaptan)

MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)

NOTE 1. See Section 8 for additional exposure limit information for C₁ to C₃ Aliphatic Hydrocarbon Gases (i.e., methane, ethane, propane).

Section 4: FIRST AID MEASURES

Skin Contact: First aid is not normally required.
Eye contact: If irritation/redness develops, move victim away from exposure into fresh air and flush eyes with clean water.
Inhalation: Ensure your own safety before attempting rescue. Move victim to fresh air. Administer oxygen if breathing has stopped. If heart beat can not be detected begin CPR. If person is overcome or been adversely affected by the emergency, obtain medical attention immediately.
Ingestion: Unlikely route of exposure as this is a gas at normal room temperature and pressure.
General Advise: Use extreme care in handling due to high flammability.

Section 5: FIRE FIGHTING MEASURES

Flammability: Flammable gas and can be ignited by heat, flames, sparks or other sources of ignition (e.g., static electricity, pilot lights or mechanical/electrical equipment).
Suitable Extinguishing Media: Dry chemical, carbon dioxide, water spray or fog.
Special Procedures: Shut off flow of gas from a safe location. Use full protective equipment and self-contained breathing apparatus (SCBA). Do not extinguish flame until gas flow is shut off. Use gas detectors in confined spaces. Evaporate area if cooling of containers is not possible. For large fires nonessential personnel should be evacuated beyond 750 metres.
Products of Combustion: Carbon dioxide and carbon monoxide
Protection of Firefighters: Firefighters should wear SCBA in case of oxygen deficient atmosphere.
Sensitivity to Static Discharge: Flammable
Sensitivity to Mechanical Impact: None
Explosive Power: Not available
Rate of Burning: Not available
TDG Flammability Class 2.1

Section 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protection recommended in Section 8.
Environmental Precautions: Not applicable
Leak and Spill Procedure: Evacuate area. Call emergency services and gas supplier. For large releases nonessential personnel should be evacuated beyond 750 metres. Eliminate any source of ignition.
Methods for Containment: Stay away and upwind of spill/release.
Waste Disposal: Vent to outside atmosphere.
Other Information: Allow to vapourize and disperse to atmosphere.

In case of an emergency and no response at FortisBC, call SERVICE CENTER: 1 (800) 663-9911.

Section 7: HANDLING AND STORAGE

Handling: Observe handling regulations for compressed gases and flammable materials. To be handled by trained personnel only and followed with approved operating procedures.
Storage: Comply with storage regulations for compressed gases and flammable materials. No smoking or open flames in storage area.

MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits: Simple asphyxiant - Maintain a minimum 19.5% oxygen (O₂) content (below 19.5% O₂ is considered to be O₂ deficient).

Constituent ^{NOTE 2}	ACGIH (8-hour TWA)	WorkSafeBC (8-hour TWA)
Methane	Minimum O ₂ content	1000 ppm
Ethane	Minimum O ₂ content	1000 ppm
Propane	Minimum O ₂ content	1000 ppm
Mercaptan Odourant	0.5 ppm (ethyl mercaptan)	0.5 ppm (ethyl mercaptan)
	0.5 ppm (methyl mercaptan)	0.5 ppm (methyl mercaptan)

NOTE 2. Mercaptan odourant mixtures commonly contain ethyl mercaptan and/or methyl mercaptan (both ethyl mercaptan and methyl mercaptan have 8-hour TWA exposure limits of 0.5 ppm).

Personal Protective

Equipment: Ensure use of proper personal protective equipment (PPE) at all times when handling this product.

Eye/face: Eye protection (e.g., safety glasses) and/or face shields.

Skin: Safety work boots. Chemical resistant gloves are not required but recommended as good practice when handling chemicals. Flame retardant clothing should be worn in potentially flammable areas.

Respiratory: If engineering controls and work practices are not effective in controlling exposure to natural gas, then wear suitable respiratory protection. Supplied air or SCBA.

Other Considerations: None

Engineering Controls: All installations (i.e., mechanical ventilation) must conform to code requirements. Provide adequate ventilation to maintain below exposure limits and explosive limits.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Gas
Colour:	Colourless
Odour:	Gas odour
Specific Gravity (Water = 1):	Not applicable
Odour Threshold (ppm):	2500
Vapour Pressure (mm Hg):	Not applicable
Vapour Density (Air = 1):	0.59
Evaporation Rate (nButAC = 1):	Not applicable (gas at room temperature)
Boiling Point (°C):	-160
Freezing Point (°C):	Not applicable
Solubility in water (20°C):	Slight
Percent Volatile (by volume):	Not available
pH:	Not available
Density (g/ml):	Not available
Partition Coefficient (water/oil):	Not available
Flash Point (°C):	Flammable gas
Flammability (solid, gas):	Flammable gas
Lower Explosion Limit (%):	5 (by volume)
Upper Explosion Limit (%):	15 (by volume)
Auto-ignition Temperature (°C):	537

Section 10: STABILITY AND REACTIVITY

Chemical Stability: Yes

MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)

Conditions to Avoid:	High heat
Incompatibility with Other Substances:	Avoid contact with strong oxidizing agents
Hazardous Decomposition Products:	CO _x , luminous clean flame on combustion
Reactivity (and Under What Conditions):	Strong oxidizing agents increase risk of fire (peroxides, perchlorates, chlorine, liquid oxygen).

Section 11: TOXICOLOGICAL INFORMATION

LD50:	Not applicable
LC50:	Not applicable
Acute Effects:	Simple asphyxiant: at high concentrations, natural gas can displace oxygen and cause asphyxiation. The ACGIH TLV-TWA for C ₁ to C ₃ Aliphatic Hydrocarbon Gases is believed to be protective against potential health effects that include CNS depression and cardiac sensitization. The TLV-TWA is based upon the abilities of these gases (methane, ethane, propane) to produce weak depressant effects on the CNS at high concentration levels approaching the lower explosive limit. It has also been reported that ethane and propane can induce cardiac arrhythmias under certain conditions leading to ventricular fibrillation which can result in death in the presence of high epinephrine levels.
Chronic Effects:	None
Carcinogenicity:	Not considered carcinogenic by IARC, NTP, ACGIH or OSHA.
Reproductive Effects:	Not available
Teratogenicity:	Not available
Mutagenicity:	Not available
Irritant:	Not available
Sensitizer:	Not available
Synergistic Effects:	Not available

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity:	Not available
Persistence/ Degradability:	Not available
Bioaccumulation/ Accumulation:	Not available

There is no information available on the ecotoxicological effects of natural gas. Because of the high volatility of natural gas, it is unlikely to cause ground or water pollution. Natural gas released into the environment will disperse rapidly into the atmosphere and undergo photochemical degradation.

Section 13: DISPOSAL CONSIDERATIONS

Disposal:	Allow to dissipate to the atmosphere (if permitted by federal/provincial/municipal requirements). Dispose in a safe location, preferably by burning with a flare. If disposal of natural gas cannot be flared, care must be taken to ensure complete dissipation of the gas to a concentration below its flammable limits.
------------------	--

Section 14: TRANSPORT INFORMATION

TDG Classification:	Class 2.1 Flammable Gases
UN/PIN Number:	1971
TDG Shipping Description:	Natural gas, compressed with high methane content
Special Shipping Information:	Handle as extremely flammable gas. Electronically ground/bond during transfer to avoid static accumulation. Precaution should be taken to minimize inhalation of natural gas.

MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)

Section 15: REGULATORY INFORMATION

DSL (Canada): This product is on the DSL list (Canada).
WHMIS Class: A – Compressed Gas;
B1 – Flammable and Combustible Material – Division 1 Flammable Gases

Section 16: OTHER INFORMATION

National Fire Protection Association (NFPA 704) Ratings:

Health	1	LEGEND	0 = minimal hazard
Flammability	4		1 = slight hazard
Instability	0		2 = moderate hazard
			3 = severe hazard
			4 = extreme hazard

(For natural gas from NFPA 325)

Hazardous Materials Identification System (HMIS) Ratings:

Health	1	LEGEND	0 = minimal hazard
Flammability	4		1 = slight hazard
Physical Hazard	3		2 = moderate hazard
			3 = serious hazard
			4 = severe hazard

(For methane from HMIS Chemical Ratings Guide)

Prepared by: AMEC Foster Wheeler
Environment & Infrastructure
Occupational Hygiene and Safety Group

Phone Number: (604) 294-3811
Preparation Date: February 05, 2015

Additional Information and Comments: This MSDS has been revised and updated from the last revision date of January 26, 2012. All sections and the order that which they appear have been documented as per American National Standard – *For Hazardous Industrial Chemicals – Material Safety Data Sheets Preparation* (ANSI Z400.1-2004).

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for their own particular use.

Information Sources: Various

Attachment O
Emissions Summary Sheet

G70-A EMISSIONS SUMMARY SHEET

Emission Point ID No.	Emission Point Type ¹	Emission Unit Vented Through This Point		Air Pollution Control Device		All Regulated Pollutants - Chemical Name/CAS ² (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions ³		Maximum Potential Controlled Emissions ⁴		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used ⁵
		ID No.	Source	ID No.	Device Type		lb/hr	ton/yr	lb/hr	ton/yr		
TRUCKW	RELIEF VENT	TRUCK W	TRUCK W	NA	NA	NMNEVOC	0.7568	0.1493	NA	NA	GAS/VAPOR	EE-AP42
TRUCKW	RELIEF VENT	TRUCK W	TRUCK W	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	EE-AP42
TRUCKW	FUGITIVE	TRUCK W	TRUCK W	NA	NA	PM10	3.6771	0.7255	NA	NA	GAS/VAPOR	EE-AP42
FUG	FUGITIVE	FUG	FUG	NA	NA	NMNEVOC	0.0350	0.1555	NA	NA	GAS/VAPOR	EE-AP42
FUG	FUGITIVE	FUG	FUG	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	EE-AP42
EQUIP BD	VERTICAL	BD VENT	FUG	NA	NA	NMNEVOC	1.1130	0.0117	NA	NA	GAS/VAPOR	EE-AP42
EQUIP BD	VERTICAL	BD VENT	FUG	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	NOX	0.0487	0.2135	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	CO	0.0409	0.1793	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	NMNEVOC	0.0027	0.0117	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	SO2	0.0003	0.0013	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	PM10	0.0037	0.0162	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	HAPS	0.0009	0.0040	NA	NA	GAS/VAPOR	EE-AP42
A2LH	VERTICAL	A2LH	A2LH	NA	NA	NOX	0.0487	0.2135	NA	NA	GAS/VAPOR	EE-AP42
A2LH	VERTICAL	A2LH	A2LH	NA	NA	CO	0.0409	0.1793	NA	NA	GAS/VAPOR	EE-AP42
A2LH	VERTICAL	A2LH	A2LH	NA	NA	NMNEVOC	0.0027	0.0117	NA	NA	GAS/VAPOR	EE-AP42
A2LH	VERTICAL	A2LH	A2LH	NA	NA	SO2	0.0003	0.0013	NA	NA	GAS/VAPOR	EE-AP42
A2LH	VERTICAL	A2LH	A2LH	NA	NA	PM10	0.0037	0.0162	NA	NA	GAS/VAPOR	EE-AP42

G70-A Oil and Natural Gas Production Facilities
Instructions and Forms

Emission Point ID No.	Emission Point Type ¹	Emission Unit Vented Through This Point		Air Pollution Control Device		All Regulated Pollutants - Chemical Name/CAS ² (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions ³		Maximum Potential Controlled Emissions ⁴		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used ⁵
		ID No.	Source	ID No.	Device Type		lb/hr	ton/yr	lb/hr	ton/yr		
A2LH	VERTICAL	A2LH	A2LH	NA	NA	HAPS	0.0009	0.0040	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	NOX	0.0487	0.2135	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	CO	0.0409	0.1793	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	NMNEVOC	0.0027	0.0117	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	SO2	0.0003	0.0013	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	PM10	0.0037	0.0162	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	HAPS	0.0009	0.0040	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	NOX	0.0487	0.2135	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	CO	0.0409	0.1793	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	NMNEVOC	0.0027	0.0117	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	SO2	0.0003	0.0013	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	PM10	0.0037	0.0162	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	HAPS	0.0009	0.0040	NA	NA	GAS/VAPOR	EE-AP42
DEHYRB1	VERTICAL	DEHYRB1	DEHYRB1	NA	NA	NOX	0.0975	0.4269	NA	NA	GAS/VAPOR	EE-AP42
DEHYRB1	VERTICAL	DEHYRB1	DEHYRB1	NA	NA	CO	0.0819	0.3586	NA	NA	GAS/VAPOR	EE-AP42
DEHYRB1	VERTICAL	DEHYRB1	DEHYRB1	NA	NA	NMNEVOC	0.0054	0.0235	NA	NA	GAS/VAPOR	EE-AP42
DEHYRB1	VERTICAL	DEHYRB1	DEHYRB1	NA	NA	SO2	0.0006	0.0026	NA	NA	GAS/VAPOR	EE-AP42
DEHYRB1	VERTICAL	DEHYRB1	DEHYRB1	NA	NA	PM10	0.0074	0.0324	NA	NA	GAS/VAPOR	EE-AP42
DEHYRB1	VERTICAL	DEHYRB1	DEHYRB1	NA	NA	HAPS	0.0018	0.0080	NA	NA	GAS/VAPOR	EE-AP42
PWTK1	VERTICAL	PWTK1	PWTK1	NA	NA	NMNEVOC	0.0233	0.1013	NA	NA	GAS/VAPOR	M - TANKS
PWTK1	VERTICAL	PWTK1	PWTK1	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	M - TANKS
PWTK2	VERTICAL	PWTK2	PWTK2	NA	NA	NMNEVOC	0.0233	0.1013	NA	NA	GAS/VAPOR	M - TANKS
PWTK2	VERTICAL	PWTK2	PWTK2	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	M - TANKS

G70-A Oil and Natural Gas Production Facilities
Instructions and Forms

PWTK3	VERTICAL	PWTK3	PWTK3	NA	NA	NMNEVOC	0.0233	0.1013	NA	NA	GAS/VAPOR	M - TANKS
PWTK3	VERTICAL	PWTK3	PWTK3	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	M - TANKS
PWTK4	VERTICAL	PWTK4	PWTK4	NA	NA	NMNEVOC	0.0233	0.1013	NA	NA	GAS/VAPOR	M - TANKS
PWTK4	VERTICAL	PWTK4	PWTK4	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	M - TANKS
DEHY	VERTICAL	DEHY	DEHY	NA	NA	NMNEVOC	0.3621	1.5858	NA	NA	GAS/VAPOR	M-GLYCALC
DEHY	VERTICAL	DEHY	DEHY	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	M-GLYCALC

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

- ¹ Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.
- ² List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. DO NOT LIST H₂, H₂O, N₂, O₂, and Noble Gases
- ³ Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- ⁴ Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- ⁵ Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; M = modeling; O = other (specify).

Attachment P
Other Supporting Documentation

Epic Natural Gas Analysis Report

Sample Information

Sample Information	
Sample Name	3140331547_Harbert A3H
Operator	Drew Nicholas
Injection Date	2014-08-22 11:54:29
NGA Phys. Property Data Source	GPA Standard 2145-09 (FPS)

Component Results

Component Name	Raw Amount	Norm%	Gross HV (Dry) (BTU /IDL cu.ft.)	Gross HV (Sat.) (BTU /IDL cu.ft.)	Relative Gas Density (Dry)	GPM (Dry) (Gal. / 1000 cu.ft.)
Nitrogen	0.2872	0.2872	0.0000	0.0000	0.0028	0.0317
Methane	95.4281	95.4216	965.9879	949.1719	0.5285	16.2079
Carbon Dioxide	0.1589	0.1589	0.0000	0.0000	0.0024	0.0272
Ethane	3.8233	3.8230	67.8122	66.6326	0.0397	1.0244
Propane	0.2724	0.2724	6.8697	6.7512	0.0041	0.0752
i-Butane	0.0150	0.0150	0.4889	0.4791	0.0003	0.0049
n-Butane	0.0188	0.0188	0.6147	0.6049	0.0004	0.0059
i-Pentane	0.0019	0.0019	0.0762	0.0762	0.0000	0.0007
n-Pentane	0.0012	0.0012	0.0482	0.0482	0.0000	0.0004
n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total:	100.0068	100.0000	1041.8978	1023.7615	0.5783	17.3783

Results Summary

Result	Dry	Sat.
Total Raw Mole% (Dry)	100.0068	
Total Normalized Mole%	100.0000	100.0000
Pressure Base (psia)	14.730	
Temperature Base	60.0	
Flowing Temperature (Deg. F)	69.70	
Flowing Pressure (PSIG)	847.63	
Gross Heating Value (BTU / Ideal cu.ft.)	1041.8978	1023.7615
Gross Heating Value (BTU / Real cu.ft.)	1044.1624	1026.3386
Relative Density (G), Ideal	0.5783	0.5791
Relative Density (G), Real	0.5793	0.5803
Gas Density, Real (lbm / cu.ft.)	0.04433	0.04441
Compressibility (Z) Factor	0.9978	0.9975



Venus Laboratory
2440 Chambers Street, Suite A
Venus, TX 76084

Certificate of Analysis

Apr. 01, 2015

Workorder: 15040001

Kaycie Wallace
XTO
810 Houston St
Ft Worth, TX 76102

Project: XTO
Collection State: WV

Enclosed are the analytical results for the sample(s) received on Wednesday, April 01, 2015.

The analyses were performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

If you have questions concerning this report, please contact us referencing workorder 15040001.

SPL is pleased to be of service to you and we look forward to fulfilling your current and future analytical needs.

Sincerely,

Hydrocarbon Laboratory Manager



Certificate of Analysis
 Number: 3040-15040001-001A

Venus Laboratory
 2440 Chambers Street, Suite A
 Venus, TX 76084

Station Name: Quinn A
 Station Number: 37-019-21867
 Station Location: Bridgeport WV
 Cylinder No: 17476
 Analyzed: 04/01/2015 09:15:25 by RJ

Sampled By: Josh R
 Sample Of: Produced Water Spot
 Sample Date: 03/25/2015 09:35
 Sample Conditions: 526 psig, @ 37 °F
 Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia	
Hydrogen Sulfide	0.0000	0.0000		GPM TOTAL C2+ 2.263
Nitrogen	1.2181	1.8938		
Carbon Dioxide	1.5529	3.7929		
Methane	88.8214	79.0810		
Ethane	7.3093	12.1977	1.949	
Propane	0.9392	2.2985	0.258	
Iso-Butane	0.0300	0.0968	0.010	
n-Butane	0.0130	0.0419	0.004	
Iso-Pentane	0.0021	0.0084	0.001	
n-Pentane	0.0010	0.0040	0.000	
i-Hexanes	0.0041	0.0185	0.002	
n-Hexane	0.0014	0.0067	0.001	
Benzene	0.0160	0.0693	0.004	
Cyclohexane	0.0102	0.0476	0.003	
i-Heptanes	0.0068	0.0344	0.003	
n-Heptane	0.0012	0.0068	0.001	
Toluene	0.0397	0.2026	0.013	
i-Octanes	0.0105	0.0602	0.005	
n-Octane	0.0011	0.0071	0.001	
Ethylbenzene	0.0039	0.0228	0.001	
Xylenes	0.0160	0.0945	0.006	
i-Nonanes	0.0011	0.0072	0.001	
n-Nonane	0.0003	0.0020	0.000	
i-Decanes	0.0007	0.0051	0.000	
n-Decane	0.0000	0.0002	0.000	
Decanes Plus	0.0000	0.0000	0.000	
	100.0000	100.0000	2.263	

Physical Properties	Total
Calculated Molecular Weight	18.02
GPA 2172-09 Calculation:	
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F	
Real Gas Dry BTU	1056.2
Water Sat. Gas Base BTU	1037.7
Relative Density Real Gas	0.6234
Compressibility Factor	0.9976



Certificate of Analysis
 Number: 3040-15040001-001A

Venus Laboratory
 2440 Chambers Street, Suite A
 Venus, TX 76084

Station Name: Quinn A
 Station Number: 37-019-21867
 Station Location: Bridgeport WV
 Cylinder No: 17476
 Analyzed: 04/01/2015 09:15:25 by RJ

Sampled By: Josh R
 Sample Of: Produced Water Spot
 Sample Date: 03/25/2015 09:35
 Sample Conditions: 526 psig, @ 37 °F
 Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	1.2181	1.8938		GPM TOTAL C2+	2.263
Carbon Dioxide	1.5529	3.7929		GPM TOTAL C3+	0.314
Methane	88.8214	79.0810		GPM TOTAL iC5+	0.042
Ethane	7.3093	12.1977	1.949		
Propane	0.9392	2.2985	0.258		
Iso-butane	0.0300	0.0968	0.010		
n-Butane	0.0130	0.0419	0.004		
Iso-pentane	0.0021	0.0084	0.001		
n-Pentane	0.0010	0.0040	0.000		
Hexanes Plus	0.1130	0.5850	0.041		
	100.0000	100.0000	2.263		

Physical Properties

Relative Density Real Gas	Total	0.6234
Calculated Molecular Weight		18.02
Compressibility Factor		0.9976

GPA 2172-09 Calculation:
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F
 Real Gas Dry BTU 1056.2000
 Water Sat. Gas Base BTU 1037.7000

Comments: H2O Mol% : 1.750 ; Wt% : 1.750



Certificate of Analysis
 Number: 3040-15040001-001A

Venus Laboratory
 2440 Chambers Street, Suite A
 Venus, TX 76084

Station Name: Quinn A
 Station Number: 37-019-21867
 Station Location: Bridgeport WV
 Cylinder No: 17476
 Analyzed: 04/01/2015 09:15:25 by RJ

Sampled By: Josh R
 Sample Of: Produced Water Spot
 Sample Date: 03/25/2015 09:35
 Sample Conditions: 526 psig, @ 37 °F
 Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	1.2181	1.8938		GPM TOTAL C2+	2.263
Carbon Dioxide	1.5529	3.7929		GPM TOTAL C3+	0.314
Methane	88.8214	79.0810		GPM TOTAL iC5+	0.042
Ethane	7.3093	12.1977	1.949		
Propane	0.9392	2.2985	0.258		
Iso-Butane	0.0300	0.0968	0.010		
n-Butane	0.0130	0.0419	0.004		
Iso-Pentane	0.0021	0.0084	0.001		
n-Pentane	0.0010	0.0040	0.000		
Hexane	0.0055	0.0252	0.003		
Heptanes Plus	0.1075	0.5598	0.038		
	100.0000	100.0000	2.263		

Physical Properties	Total
Relative Density Real Gas	0.6234
Calculated Molecular Weight	18.02
Compressibility Factor	0.9976

GPA 2172-09 Calculation:

Calculated Gross BTU per ft³ @ 14.65 psia & 60°F

Real Gas Dry BTU	1056.2000
Water Sat. Gas Base BTU	1037.7000

Comments: H2O Mol% : 1.750 ; Wt% : 1.750



Certificate of Analysis
Number: 3040-15040001-001A

Venus Laboratory
2440 Chambers Street, Suite A
Venus, TX 76084

Station Name: Quinn A
Station Number: 37-019-21867
Station Location: Bridgeport WV
Cylinder No: 17476
Analyzed: 04/01/2015 by BCM

Sampled By: Josh R
Sample Of: Produced Water Spot
Sample Date: 03/25/2015 09:35
Sample Conditions: 526 psig, @ 37 °F
Method:

Analytical Data

Analyte	Result	Units	Detection Limit
Flash Factor	1.78	cubic ft/bbl	

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Boggess Well Pad

File Name:

Date: April 08, 2015

DESCRIPTION:

Description: Ran at 20 MMSCFD,

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.3797	9.114	1.6633
Ethane	0.2324	5.578	1.0180
Propane	0.0866	2.077	0.3791
Isobutane	0.0140	0.336	0.0613
n-Butane	0.0284	0.681	0.1243
Isopentane	0.0048	0.115	0.0210
n-Pentane	0.0035	0.085	0.0154
Total Emissions	0.7494	17.986	3.2825
Total Hydrocarbon Emissions	0.7494	17.986	3.2825
Total VOC Emissions	0.1373	3.294	0.6012

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	9.6858	232.459	42.4238
Ethane	1.2671	30.409	5.5497
Propane	0.1818	4.363	0.7963
Isobutane	0.0159	0.382	0.0698
n-Butane	0.0226	0.543	0.0990
Isopentane	0.0029	0.070	0.0127
n-Pentane	0.0016	0.038	0.0069
Total Emissions	11.1777	268.264	48.9581
Total Hydrocarbon Emissions	11.1777	268.264	48.9581
Total VOC Emissions	0.2248	5.395	0.9846

EQUIPMENT REPORTS:

ABSORBER

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

Calculated Absorber Stages: 1.25
 Calculated Dry Gas Dew Point: 1.19 lbs. H2O/MMSCF

Temperature: 60.0 deg. F
 Pressure: 450.0 psig
 Dry Gas Flow Rate: 20.0000 MMSCF/day
 Glycol Losses with Dry Gas: 0.0127 lb/hr
 Wet Gas Water Content: Saturated
 Calculated Wet Gas Water Content: 30.39 lbs. H2O/MMSCF
 Calculated Lean Glycol Recirc. Ratio: 8.88 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.90%	96.10%
Carbon Dioxide	99.81%	0.19%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.96%	0.04%
Propane	99.92%	0.08%
Isobutane	99.86%	0.14%
n-Butane	99.81%	0.19%
Isopentane	99.78%	0.22%
n-Pentane	99.70%	0.30%

FLASH TANK

Flash Control: Vented to atmosphere
 Flash Temperature: 60.0 deg. F
 Flash Pressure: 40.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.99%	0.01%
Carbon Dioxide	45.11%	54.89%
Nitrogen	3.65%	96.35%
Methane	3.77%	96.23%
Ethane	15.50%	84.50%
Propane	32.25%	67.75%
Isobutane	46.77%	53.23%
n-Butane	55.66%	44.34%
Isopentane	62.55%	37.45%
n-Pentane	69.31%	30.69%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	55.52%	44.48%
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	0.73%	99.27%
n-Pentane	0.68%	99.32%

STREAM REPORTS:

WET GAS STREAM

Temperature: 60.00 deg. F
 Pressure: 464.70 psia
 Flow Rate: 8.34e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.40e-002	2.53e+001
Carbon Dioxide	1.59e-001	1.54e+002
Nitrogen	2.87e-001	1.77e+002
Methane	9.54e+001	3.36e+004
Ethane	3.82e+000	2.52e+003
Propane	2.72e-001	2.63e+002
Isobutane	1.50e-002	1.91e+001
n-Butane	1.90e-002	2.43e+001
Isopentane	2.00e-003	3.17e+000
n-Pentane	9.99e-004	1.58e+000
Total Components	100.00	3.68e+004

DRY GAS STREAM

Temperature: 60.00 deg. F
 Pressure: 464.70 psia
 Flow Rate: 8.33e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.50e-003	9.88e-001
Carbon Dioxide	1.59e-001	1.53e+002
Nitrogen	2.87e-001	1.77e+002
Methane	9.54e+001	3.36e+004
Ethane	3.82e+000	2.52e+003
Propane	2.72e-001	2.63e+002
Isobutane	1.50e-002	1.91e+001
n-Butane	1.90e-002	2.42e+001
Isopentane	2.00e-003	3.16e+000
n-Pentane	9.97e-004	1.58e+000
Total Components	100.00	3.68e+004

LEAN GLYCOL STREAM

Temperature: 60.00 deg. F
 Flow Rate: 3.60e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	2.00e+003
Water	1.50e+000	3.04e+001
Carbon Dioxide	1.40e-012	2.85e-011
Nitrogen	8.63e-014	1.75e-012
Methane	5.21e-018	1.06e-016
Ethane	2.28e-008	4.62e-007
Propane	4.30e-010	8.72e-009
Isobutane	3.85e-011	7.80e-010
n-Butane	5.63e-011	1.14e-009
Isopentane	1.75e-006	3.54e-005
n-Pentane	1.18e-006	2.40e-005
Total Components	100.00	2.03e+003

 RICH GLYCOL AND PUMP GAS STREAM

Temperature: 60.00 deg. F
 Pressure: 464.70 psia
 Flow Rate: 3.67e+000 gpm
 NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.67e+001	2.00e+003
Water	2.65e+000	5.48e+001
Carbon Dioxide	1.53e-002	3.16e-001
Nitrogen	2.60e-003	5.37e-002
Methane	4.88e-001	1.01e+001
Ethane	7.27e-002	1.50e+000
Propane	1.30e-002	2.68e-001
Isobutane	1.45e-003	2.99e-002
n-Butane	2.47e-003	5.10e-002
Isopentane	3.75e-004	7.74e-003
n-Pentane	2.48e-004	5.12e-003
Total Components	100.00	2.06e+003

 FLASH TANK OFF GAS STREAM

Temperature: 60.00 deg. F
 Pressure: 54.70 psia
 Flow Rate: 2.49e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.59e-002	3.07e-003
Carbon Dioxide	6.00e-001	1.73e-001
Nitrogen	2.81e-001	5.18e-002
Methane	9.19e+001	9.69e+000
Ethane	6.42e+000	1.27e+000
Propane	6.28e-001	1.82e-001
Isobutane	4.17e-002	1.59e-002
n-Butane	5.92e-002	2.26e-002
Isopentane	6.12e-003	2.90e-003
n-Pentane	3.32e-003	1.57e-003

Total Components 100.00 1.14e+001

FLASH TANK GLYCOL STREAM

Temperature: 60.00 deg. F
 Flow Rate: 3.65e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.73e+001	2.00e+003
Water	2.67e+000	5.48e+001
Carbon Dioxide	6.95e-003	1.43e-001
Nitrogen	9.56e-005	1.96e-003
Methane	1.85e-002	3.80e-001
Ethane	1.13e-002	2.32e-001
Propane	4.22e-003	8.66e-002
Isobutane	6.82e-004	1.40e-002
n-Butane	1.38e-003	2.84e-002
Isopentane	2.36e-004	4.84e-003
n-Pentane	1.73e-004	3.55e-003
Total Components	100.00	2.05e+003

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
 Pressure: 14.70 psia
 Flow Rate: 5.27e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.73e+001	2.44e+001
Carbon Dioxide	2.33e-001	1.43e-001
Nitrogen	5.04e-003	1.96e-003
Methane	1.70e+000	3.80e-001
Ethane	5.56e-001	2.32e-001
Propane	1.41e-001	8.66e-002
Isobutane	1.73e-002	1.40e-002
n-Butane	3.51e-002	2.84e-002
Isopentane	4.79e-003	4.80e-003
n-Pentane	3.51e-003	3.52e-003
Total Components	100.00	2.53e+001

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Bogges Well Pad
City:	Pittsburgh
State:	West Virginia
Company:	XTO Energy, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Single Tank Run at 50 BWPD

Tank Dimensions

Shell Height (ft):	20.00
Diameter (ft):	12.00
Liquid Height (ft):	19.00
Avg. Liquid Height (ft):	10.00
Volume (gallons):	16,074.56
Turnovers:	48.00
Net Throughput(gal/yr):	771,579.02
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Red/Primer
Shell Condition:	Good
Roof Color/Shade:	Red/Primer
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.00
Slope (ft/ft) (Cone Roof)	0.33

Breather Vent Settings

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

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

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

Bogges Well Pad - Vertical Fixed Roof Tank
Pittsburgh, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol Weight	Basis for Vapor Pressure Calculations
		Avg	Min	Max		Avg	Min	Max					
Produced Water	All	61.20	50.26	72.14	54.65	0.2672	0.1795	0.3904	18.0200			18.02	Option 2: A=8.10765, B=1750.286, C=235

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Bogges Well Pad - Vertical Fixed Roof Tank
Pittsburgh, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	31 2848
Vapor Space Volume (cu ft):	1,206 3716
Vapor Density (lb/cu ft):	0.0009
Vapor Space Expansion Factor:	0.0949
Vented Vapor Saturation Factor:	0.8687
Tank Vapor Space Volume	
Vapor Space Volume (cu ft):	1,206 3716
Tank Diameter (ft):	12 0000
Vapor Space Outage (ft):	10 6667
Tank Shell Height (ft):	20 0000
Average Liquid Height (ft):	10 0000
Roof Outage (ft):	0.6667
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.6667
Roof Height (ft):	2.0000
Roof Slope (ft/ft):	0.3300
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0009
Vapor Molecular Weight (lb/lb-mole):	18.0200
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2672
Daily Avg. Liquid Surface Temp (deg R):	520.8667
Daily Average Ambient Temp (deg F):	50.3083
Ideal Gas Constant R (psia cu ft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg R):	514.3183
Tank Paint Solar Absorptance (Shell):	0.8900
Tank Paint Solar Absorptance (Roof):	0.8900
Daily Total Solar Insulation Factor (Btu/ft ² day):	1,202.9556
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0949
Daily Vapor Temperature Range (deg R):	43.7657
Daily Vapor Pressure Range (psia):	0.2109
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2672
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.1795
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.3904
Daily Avg. Liquid Surface Temp (deg R):	520.8667
Daily Min. Liquid Surface Temp (deg R):	509.5253
Daily Max. Liquid Surface Temp (deg R):	531.6061
Daily Ambient Temp. Range (deg R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8687
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2672
Vapor Space Outage (ft):	10.6667
Working Losses (lb):	
Working Losses (lb):	70.0375
Vapor Molecular Weight (lb/lb-mole):	18.0200
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2672
Annual Net Throughput (gall/yr.):	771,579.0162
Annual Turnovers:	48.0000
Turnover Factor:	0.7917
Maximum Liquid Volume (gall):	16,074.5628
Maximum Liquid Height (ft):	19.0000
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	101.3223

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

Emissions Report for: Annual

Bogges Well Pad - Vertical Fixed Roof Tank
Pittsburgh, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Produced Water	70.04	31.28	101.32