October 11, 2017 Reference No. 082715

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

Dear Ms. Beverly McKeone:

Re: General Permit G70-D Modification Application
Oxford 13 Well Pad
Antero Resources Corporation

GHD Services Inc. (GHD) would like to submit this General Permit Modification application that we prepared on behalf of Antero Resources Corporation for an oil and gas facility identified as Oxford 13 Well Pad.

A General Permit Registration Modification is requested due to the following planned operational changes:

1. Increase in condensate and produced water production
2. Addition of seven 2 MM Btu/hr line heaters and removal of one existing 2.5 MM Btu/hr line heater
3. Removal of two condensate water tanks
4. Removal of four produced water tanks
5. Removal of 2 thermoelectric generators
6. Removal of one Arrow VRG 330 Vapor Recovery Unit Compressor Engine and one Caterpillar G3508 BLE Flash Gas Compressor Engine
7. Addition of two HP Ford VRU engine
8. Addition of two enclosed Cimarron combustors
9. Removal of one 18.14 MMBtu/hr vapor destruction unit and one 250 MMBtu/hr flare

Enclosed are the following documents:

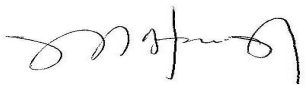
- Original copy of the G70-D General Permit Modification Application.
- Two CD copies of the G70-D General Permit Modification Application.
- The application fee with check no. 488690 in the amount of $1,500.00.

GHD
6320 Rothway Street Suite 100 Houston Texas 77040 USA
T 713 734 3090 **F** 713 734 3391 **W** www.ghd.com

Please let us know if you have any questions or require additional information.

Sincerely,

GHD Services Inc.



Manuel Bautista

MB/ma/355

Encl.

cc: Barry Schatz, Antero Resources Corporation
Elizabeth McLaughlin, Antero Resources Corporation

G70-D General Permit Registration Modification Application

Oxford 13 Well Pad

Antero Resources Corporation

GHD 6320 Rothway Suite 100 Houston Texas 77040
082715 | Report No 355 | October 2017

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west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475
Fax (304) 926-0479
www.dep.wv.gov

G70-D GENERAL PERMIT REGISTRATION APPLICATION

PREVENTION AND CONTROL OF AIR POLLUTION IN REGARD TO THE CONSTRUCTION, MODIFICATION, RELOCATION, ADMINISTRATIVE UPDATE AND OPERATION OF NATURAL GAS PRODUCTION FACILITIES LOCATED AT THE WELL SITE

☐CONSTRUCTION
☒MODIFICATION
☐RELOCATION
☐CLASS I ADMINISTRATIVE UPDATE
☐CLASS II ADMINISTRATIVE UPDATE

SECTION 1. GENERAL INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): Antero Resources Corporation

Federal Employer ID No. (FEIN): 80-0162034

Applicant's Mailing Address: 1615 Wynkoop Street

City: Denver	State: CO	ZIP Code: 80202

Facility Name: Oxford 13 Well Pad

Operating Site Physical Address: approximately 0.9 mile south of Cain Run Rd and Co. Rte 54/1 intersection

City: New Milton	Zip Code: 26411	County: Doddridge

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.16876
Longitude: -80.74779

SIC Code: 1311 NAICS Code: 211111	DAQ Facility ID No. (For existing facilities) 017-00153

CERTIFICATION OF INFORMATION

This G70-D 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 the 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, 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 G70-D Registration Application will be returned to the applicant. Furthermore, if the G70-D forms are not utilized, the application will be returned to the applicant. No substitution of forms is allowed.**

I hereby certify that Barry Schatz 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 Division of Air Quality immediately.

I hereby certify that all information contained in this G70-D 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.

Responsible Official Signature:_____
Name and Title: Phone: Fax:
Email: Date:

If applicable:
Authorized Representative Signature: Barry Schatz
Name and Title: Barry Schatz/ Senior Environmental & Regulatory Manager Phone: 303-357-7276 Fax: 303-357-7315
Email: bschatz@anteroresources.com Date: 10/26/2017

If applicable:
Environmental Contact
Name and Title: Phone: Fax:
Email: Date:

OPERATING SITE INFORMATION	
Briefly describe the proposed new operation and/or any change(s) to the facility: Removal of 2 thermoelectric generators, 2 condensate tanks, 4 produced water tanks, 7-1.0 MMBtu/hr GPU heaters, 1- 2.5 MMBtu/hr line heater, 1 - 18.14 MMBtu/hr vapor destruction unit, 1 - 250 MMBtu/hr flare, 1 Arrow VRG 330 Vapor Recovery Unit Compressor Engine and 1 Waukesha Flash Gas Compressor Engine. Addition of 7-1.5 MMBtu/hr GPU heaters, 7- 2 MMBtu/hr line heaters, 2 Vapor Recovery Unit HP Ford engines and two Cimarron enclosed combustors. Increase in condensate and produced water production	
Directions to the facility: From the intersection of WV-Hwy. 18 and Co. Rte. 25 near New Milton, WV, travel south on WV-Hwy. 18 for 3 miles. Turn right on Porto Rico Rd. for 0.7 miles, then continue straight onto Toms Fork Road for another 0.7 miles. Take slight right onto Co. Rte. 54/1 for 2.5 miles, then turn left on Cain Run Road and go approx. 0.7 miles. Take access road to left and stay to the right as you go up the hill to arrive at site.	
ATTACHMENTS AND SUPPORTING DOCUMENTS	
I have enclosed the following required documents:	
Check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR13 and 45CSR22). ☒ Check attached to front of application. ☐ I wish to pay by electronic transfer. Contact for payment (incl. name and email address): ☐ I wish to pay by credit card. Contact for payment (incl. name and email address): ☒$500 (Construction, Modification, and Relocation) ☐$300 (Class II Administrative Update) ☒$1,000 NSPS fee for 40 CFR60, Subpart IIII, JJJJ, OOOO and/or OOOOa [1] ☐$2,500 NESHAP fee for 40 CFR63, Subpart ZZZZ and/or HH [2] [1] Only one NSPS fee will apply. [2] Only one NESHAP fee will apply. The Subpart ZZZZ NESHAP fee will be waived for new engines that satisfy requirements by complying with NSPS, Subparts IIII and/or JJJJ. *NSPS and NESHAP fees apply to new construction or if the source is being modified.*	
☒ Responsible Official or Authorized Representative Signature (if applicable)	
☒ Single Source Determination Form **(must be completed in its entirety)** – Attachment A	
☐ Siting Criteria Waiver (if applicable) – Attachment B	☒ Current Business Certificate – Attachment C
☒ Process Flow Diagram – Attachment D	☒ Process Description – Attachment E
☒ Plot Plan – Attachment F	☒ Area Map – Attachment G
☒ G70-D Section Applicability Form – Attachment H	☒ Emission Units/ERD Table – Attachment I
☒ Fugitive Emissions Summary Sheet – Attachment J	
☒ Gas Well Affected Facility Data Sheet (if applicable) – Attachment K	
☒ Storage Vessel(s) Data Sheet (include gas sample data, USEPA Tanks, simulation software (e.g. ProMax, E&P Tanks, HYSYS, etc.), etc. where applicable) – Attachment L	
☒ Natural Gas Fired Fuel Burning Unit(s) Data Sheet (GPUs, Heater Treaters, In-Line Heaters if applicable) – Attachment M	
☒ Internal Combustion Engine Data Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment N	
☒ Tanker Truck Loading Data Sheet (if applicable) – Attachment O	
☐ Glycol Dehydration Unit Data Sheet(s) (include wet gas analysis, GRI- GLYCalc™ input and output reports and information on reboiler if applicable) – Attachment P	
☐ Pneumatic Controllers Data Sheet – Attachment Q	
☐ Pneumatic Pump Data Sheet – Attachment R	
☒ Air Pollution Control Device/Emission Reduction Device(s) Sheet(s) (include manufacturer performance data sheet(s) if applicable) – Attachment S	
☒ Emission Calculations (please be specific and include all calculation methodologies used) – Attachment T	
☒ Facility-wide Emission Summary Sheet(s) – Attachment U	
☒ Class I Legal Advertisement – Attachment V	
☒ One (1) paper copy and two (2) copies of CD or DVD with pdf copy of application and attachments	

Attachment R
AUTHORITY OF CORPORATION
OR OTHER BUSINESS ENTITY (DOMESTIC OR FOREIGN)

TO: The West Virginia Department of Environmental Protection, Division of Air Quality

DATE: January 23, 2015

ATTN.: Director

Corporation's / other business entity's Federal Employer I.D. Number 80-0162034

The undersigned hereby files with the West Virginia Department of Environmental Protection, Division of Air Quality, a permit application and hereby certifies that the said name is a trade name which is used in the conduct of an incorporated business or other business entity.

Further, the corporation or the business entity certifies as follows:

(1) Barry Schatz (is/are) the authorized representative(s) and in that capacity may represent the interest of the corporation or the business entity and may obligate and legally bind the corporation or the business entity.

(2) The corporation or the business entity is authorized to do business in the State of West Virginia.

(3) If the corporation or the business entity changes its authorized representative(s), the corporation or the business entity shall notify the Director of the West Virginia Department of Environmental Protection, Division of Air Quality, immediately upon such change.

President or Other Authorized Officer
(Vice President, Secretary, Treasurer or other official in charge of a principal business function of the corporation or the business entity)

(If not the President, then the corporation or the business entity must submit certified minutes or bylaws stating legal authority of other authorized officer to bind the corporation or the business entity).

Secretary

Name of Corporation or business entity

Attachment A
Single Source Determination Form

ATTACHMENT A - SINGLE SOURCE DETERMINATION FORM

Classifying multiple facilities as one "stationary source" under 45CSR13, 45CSR14, and 45CSR19 is based on the definition of Building, structure, facility, or installation as given in §45-14-2.13 and §45-19-2.12. The definition states:

"Building, Structure, Facility, or Installation" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

The Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and will become effective on August 2, 2016. EPA defined the term "adjacent" and stated that equipment and activities in the oil and gas sector that are under common control will be considered part of the same source if they are located on the same site or on sites that share equipment and are within ¼ mile of each other.

Is there equipment and activities in the same industrial grouping (defined by SIC code)?
Yes ☒ No ☐

Is there equipment and activities under the control of the same person/people?
Yes ☒ No ☐

Is there equipment and activities located on the same site or on sites that share equipment and are within ¼ mile of each other?
Yes ☐ No ☒

Oxford 13 Well Pad calculation of potential to emit included all of the emission sources that belong to the same industrial grouping, are located on contiguous or adjacent properties, and are under the control of the same person. The nearby emission source that belongs to the same industrial grouping and under the control of the same person but not located on contiguous or adjacent property is the well pad site identified as Helen Hines Well Pad. It is located approximately 1.6 miles northeast of Oxford 13 Well Pad.

Attachment B
Siting Criteria Waiver

Attachment B

Siting Waiver
Oxford 13 Well Pad
Antero Resources Corporation
Doddridge County, West Virginia

A Siting Waiver form is not required because there are no occupied dwelling structures within 300 feet of Oxford 13 Well Pad.

Attachment C
Current Business Certificate

State of West Virginia

Certificate

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

ANTERO RESOURCES CORPORATION

a corporation formed under the laws of Delaware, which is authorized to transact business in West Virginia by a Certificate of Authority has filed in my office as required by the provisions of the West Virginia Code, a copy of an amendment to its Articles of Incorporation authenticated by the proper office of the state or country of its incorporation and was found to conform to law.

Therefore, I issue this

CERTIFICATE OF AMENDMENT TO CERTIFICATE OF AUTHORITY

Given under my hand and the Great Seal of the State of West Virginia on this day of June 10, 2013

Natalie E Tennant

Secretary of State

FILED

JUN 10 2013

IN THE OFFICE OF SECRETARY OF STATE

Natalie E. Tennant
Secretary of State
1900 Kanawha Blvd E
Bldg 1, Suite 157-K
Charleston, WV 25305

Penney Barker, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvsos.com
E-mail: business@wvsos.com

Office Hours: Monday – Friday
8:30 a.m. – 5:00 p.m. ET

FILE ONE ORIGINAL
(Two if you want a filed stamped copy returned to you)
FEE: $25.00

APPLICATION FOR AMENDED CERTIFICATE OF AUTHORITY

****** In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby **** applies for an Amended Certificate of Authority and submits the following statement:**

1. Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation

2. Date Certificate of Authority was issued in West Virginia: 6/25/2008

3. Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)

4. Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)

5. Other amendments:
(attach additional pages if necessary)

6. **Name and phone number of contact person.** (This is optional, however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)

Alvyn A. Schopp — Contact Name
(303) 357-7310 — Phone Number

7. **Signature information** (See below ******Important Legal Notice Regarding Signature*):

Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person

Signature: Alvyn A. Schopp **Date:** June 10, 2013

******Important Legal Notice Regarding Signature*: **Per West Virginia Code §31D-1-129. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.**

Delaware

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "ANTERO RESOURCES APPALACHIAN CORPORATION", CHANGING ITS NAME FROM "ANTERO RESOURCES APPALACHIAN CORPORATION" TO "ANTERO RESOURCES CORPORATION", FILED IN THIS OFFICE ON THE TENTH DAY OF JUNE, A.D. 2013, AT 9:37 O'CLOCK A.M.

A FILED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS.

Jeffrey W. Bullock, Secretary of State

4520810 8100

130754186

AUTHENTICATION: 0496546

DATE: 06-10-13

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

State of Delaware
Secretary of State
Division of Corporations
Delivered 09:37 AM 06/10/2013
FILED 09:37 AM 06/10/2013
SRV 130754186 - 4520810 FILE

AMENDMENT TO THE AMENDED AND RESTATED CERTIFICATE OF INCORPORATION OF ANTERO RESOURCES APPALACHIAN CORPORATION

Antero Resources Appalachian Corporation (the "Corporation"), a corporation organized and existing under the laws of the State of Delaware, hereby certifies as follows:

1. The original Certificate of Incorporation of the Corporation was filed under the name Antero Resources Barnett Corporation with the filing of the original Certificate of Incorporation of the Corporation with the Secretary of State of the State of Delaware on March 18, 2008.

2. This Amendment to the Amended and Restated Certificate of Incorporation has been duly adopted and approved in accordance with Sections 242 of the General Corporation Law of the State of Delaware.

3. Article FIRST of the Amended and Restated Certificate of Incorporation is hereby amended to read in its entirety as follows:

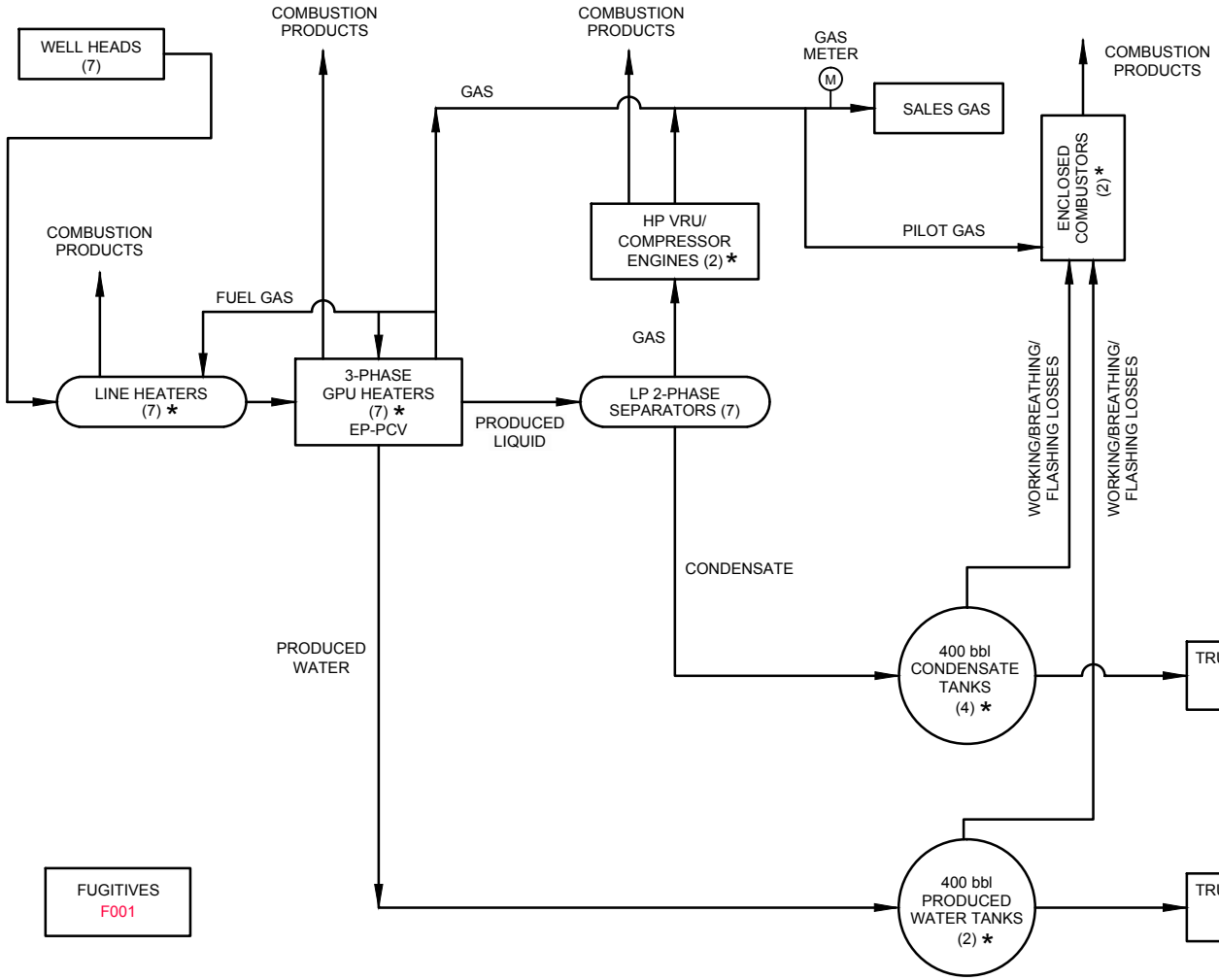
FIRST. The name of the Corporation is Antero Resources Corporation.

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Amendment to be executed by its duly authorized officer on the 10th day of June, 2013.

ANTERO RESOURCES APPALACHIAN CORPORATION

By: _____
Name: Alvyn A. Schopp
Title: Vice President of Accounting & Administration / Treasurer

Attachment D
Process Flow Diagram



* LINE HEATERS (7)

- LH001 EP-LH001
- LH002 EP-LH002
- LH003 EP-LH003
- LH004 EP-LH004
- LH005 EP-LH005
- LH006 EP-LH006
- LH007 EP-LH007

3-PHASE SEPARATORS WITH HEATERS (7)

- GPU001 EP-GPU001
- GPU002 EP-GPU002
- GPU003 EP-GPU003
- GPU004 EP-GPU004
- GPU005 EP-GPU005
- GPU006 EP-GPU006
- GPU007 EP-GPU007

CONDENSATE TANKS (4)

- TANKCOND001
- TANKCOND002
- TANKCOND003
- TANKCOND004

PRODUCED WATER TANKS (2)

- TANKPW001
- TANKPW002

ENCLOSED COMBUSTORS (2)

- EC001 EP-EC001
- EC002 EP-EC002

HIGH PRESSURE VRU/ COMPRESSOR ENGINES (2)

- ENG001 EP-ENG001
- ENG002 EP-ENG002

Attachment D

PROCESS FLOW DIAGRAM - ANTERO RESOURCES OXFORD 13 WELL PAD

Doddridge County, West Virginia

Attachment E
Process Description

Attachment E

Process Description
Oxford 13 Well Pad
Antero Resources Corporation
Doddridge County, West Virginia

A mixture of condensate, water, and entrained gas from the condensate and gas wells enters the facility through a series of line heaters (LH001-007) and gas production units (GPU001-GPU007) which are 3-phase separators where the gas, condensate, and produced water are separated. The line heaters and GPUs are fueled by a slip stream of the separated gas.

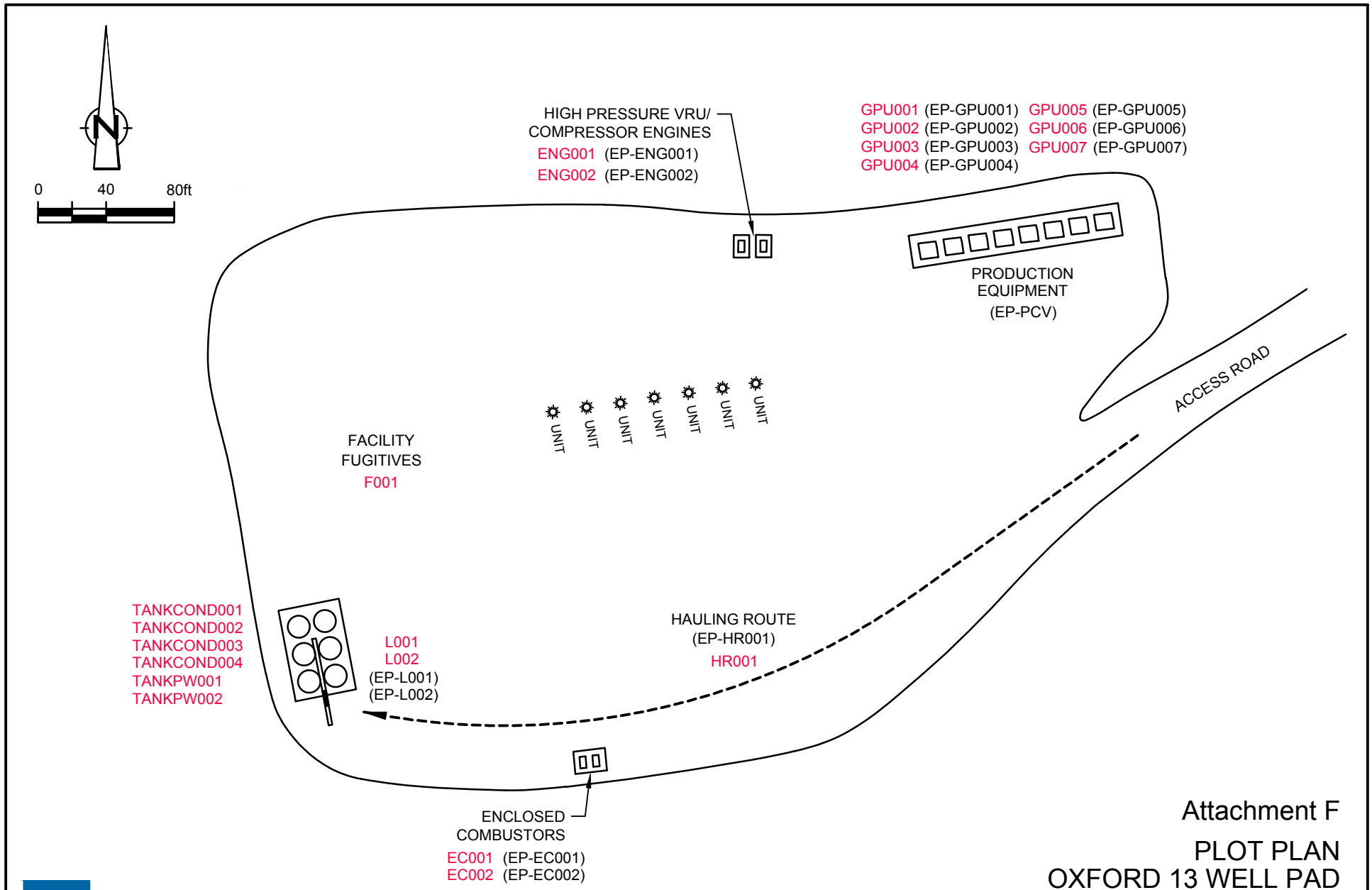
The gas from the three phase separators is metered and sent to the sales gas pipeline. The water flow to the produced water storage tanks (TANKPW001-002). The condensate is then sent to two phase low pressure separators where gas is further separated. The gas is routed to the gas fueled compressor engines (ENG001-002), compressed, metered and sent to the sales gas line. The condensate from the two phase separators flows to the condensate storage tanks (TANKSCOND001-004). The line heaters are only used during the first several months from start of production and will be removed once production has normalized.

The facility has four (4) tanks (TANKCOND001-004) on site to store condensate and two (2) tanks (TANKPW001-002) to store produced water prior to removal from the site. The flashing, working and breathing losses from the tanks are routed to two enclosed combustors (EC001-002) to control the emissions. The enclosed combustors that will be used to control emissions are designed to achieve a VOC destruction efficiency of 98 percent.

Condensate and produced water are transported off site on an as needed basis via tanker truck. Truck loading connections are in place to pump condensate (L001) and produced water (L002) from the storage tanks into tanker trucks. Emissions from the loading operations are vented to the atmosphere.

Emissions from the facility's emission sources were calculated using the extended analysis of the condensate from Gaskins Unit 1H, one of the wells in the Hamilton Well Pad, and gas from Oxford 11E, one of the wells in the Oxford 11 Well Pad. The condensate extended analysis and gas analysis are considered representative of the materials from Oxford 13 Well Pad, being in the same Marcellus rock formation.

Attachment F
Plot Plan

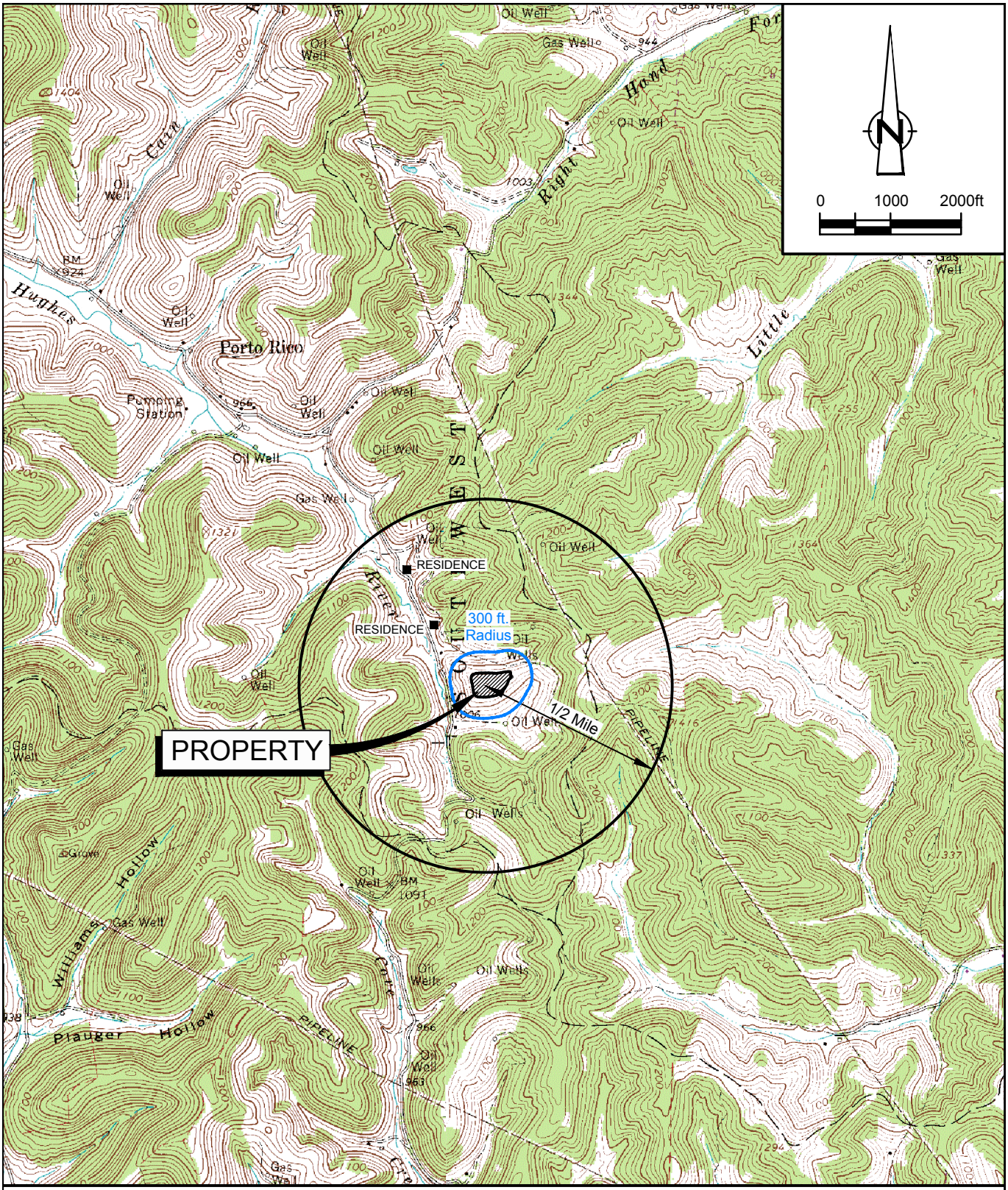


Attachment F

PLOT PLAN
OXFORD 13 WELL PAD
ANTERO RESOURCES
Doddridge County, West Virginia

82715-00(355)GN-WA002 SEP 26, 2017

Attachment G
Area Map



SOURCE: USGS QUADRANGLE MAPS;
NEW MILTON AND OXFORD, WEST VIRGINIA

SITE COORDINATES: LAT. 39.16876, LONG. -80.74779
SITE ELEVATION: 1150 ft AMSL

GHD

Attachment G

AREA MAP
OXFORD 13 WELL PAD
ANTERO RESOURCES
Doddridge County, West Virginia

82715-00(355)GN-WA003 SEP 26, 2017

Attachment H
G70-D Section Applicability Form

ATTACHMENT H – G70-D SECTION APPLICABILITY FORM

General Permit G70-D Registration[1]
Section Applicability Form

General Permit G70-D was developed to allow qualified applicants to seek registration for a variety of sources. These sources include gas well affected facilities, storage vessels, gas production units, in-line heaters, heater treaters, glycol dehydration units and associated reboilers, pneumatic controllers, centrifugal compressors, reciprocating compressors, reciprocating internal combustion engines (RICEs), tank truck loading, fugitive emissions, 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-D 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.

GENERAL PERMIT G70-D APPLICABLE SECTIONS	
☒Section 5.0	Gas Well Affected Facility (NSPS, Subpart OOOO/OOOOa)
☒Section 6.0	Storage Vessels Containing Condensate and/or Produced Water[1]
☒Section 7.0	Storage Vessel Affected Facility (NSPS, Subpart OOOO/OOOOa)
☒Section 8.0	Control Devices and Emission Reduction Devices not subject to NSPS Subpart OOOO/OOOOa and/or NESHAP Subpart HH
☒Section 9.0	Small Heaters and Reboilers not subject to 40CFR60 Subpart Dc
☐Section 10.0	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO/OOOOa)
☐Section 11.0	Pneumatic Pump Affected Facility (NSPS, Subpart OOOOa)
☒Section 12.0	Fugitive Emissions GHG and VOC Standards (NSPS, Subpart OOOOa)
☒Section 13.0	Reciprocating Internal Combustion Engines, Generator Engines
☒Section 14.0	Tanker Truck/Rail Car Loading[2]
☐Section 15.0	Glycol Dehydration Units[3]

1 *Applicants that are subject to Section 6 may also be subject to Section 7 if the applicant is subject to the NSPS, Subparts OOOO or OOOOa control requirements or the applicable control device requirements of Section 8.*

2 *Applicants that are subject to Section 14 may also be subject to control device and emission reduction device requirements of Section 8.*

3 *Applicants that are subject to Section 15 may also be subject to the requirements of Section 9 (reboilers). Applicants that are subject to Section 15 may also be subject to control device and emission reduction device requirements of Section 8.*

Attachment I
Emission Units/ ERD Table

ATTACHMENT I – EMISSION UNITS / EMISSION REDUCTION DEVICES (ERD) TABLE

Include ALL emission units and air pollution control devices /ERDs that will be part of this permit application review. This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed	Manufac. Date[3]	Design Capacity	Type[4] and Date of Change	Control Device(s)[5]	ERD (s)[6]
GPU001, GPU002, GPU003, GPU004, GPU005, GPU006, GPU007	EP-GPU001, EP-GPU002, EP-GPU003, EP-GPU004, EP-GPU005, EP-GPU006, EP-GPU007	Gas Production Unit Heater	2018		1.5 MMBtu/hr	New	N/A	
LH-2 to LH-8	2E to 8E	Gas Production Unit Heater [4]			1.0 MMBtu/hr	Removal		
LH001, LH002, LH003, LH004, LH005, LH006, LH007	EP-LH001, EP-LH002, EP-LH003, EP-LH004, EP-LH005, EP-LH006, EP-LH007	Line Heater	2018		2.0 MMBtu/hr	New	N/A	
LH-1	1E	Line Heater [4]			2.5 MMBtu/hr	Removal	N/A	
F001	F001	Fugitives	2018		N/A	Existing [3]	N/A	
TANKCOND001-004	EP-EC001, EP-EC002	Condensate Tank F/W/B	2018		400 bbl each	Modification[1]	EP-EC001, EP-EC002	
T05-T06	EP-VDU-1	Condensate Tanks [4]	2018		400 bbl each	Removal	EP-VDU-1	
TANKPW001-002	EP-EC001, EP-EC002	PW Tank F/W/B	2018		400 bbl each	Modification[1]	EP-EC001, EP-EC002	
T09-T12	EP-VDU-1	Produced Water Tanks [4]	2018		400 bbl each	Removal	EP-VDU-1	
L001	EP-L001	Loading (Condensate)	2018		1,102.5 gal/hr 9,657,900 gal/yr	Modification[1]	N/A	
L002	EP-L002	Loading (Produced Water)	2018		7,000 gal/hr 61,320,000 gal/yr	Modification[1]	N/A	
HR001	EP-HR001	Haul Road	2018		Tanker Trucks Condensate: 1150 trips per year Tanker Trucks PW: 7300 trips per year Pick Up Truck: 730 trips per year	Modification[2]	N/A	
EC001	EP-EC001	Enclosed Combustor	2018		12 MMBtu/hr	New	N/A	
EC002	EP-EC002	Enclosed Combustor	2018		12 MMBtu/hr	New	N/A	
VDU-1	14E	Vapor Destruction Unit [4]			18.34 MMBtu/hr	Removal	N/A	
Flare-1	15E	Flare [4]			250 MMBtu/hr	Removal	N/A	
PCV	EP-PCV	Pneumatic CV	2018		6.6 scf/day/PCV	Existing [3]	N/A	
ENG001-002	EP-ENG001-002	HP VRU/Compressor Engine	2018	2015	76 HP	New	Non-Selective Catalytic Reduction	
CE-1	10E	Vapor Recovery Unit Compressor Engine (Arrow VRG 330)		1998	68 HP	Removal		
CE-2	11E	Flash Gas Compressor Engine (Waukesha F3524GSI)		2013	690 HP	Removal		
TG-1	12E	Thermoelectric Generator [4]			0.013 MMBtu/hr	Removal	N/A	
TG-2	13E	Thermoelectric Generator [4]			0.013 MMBtu/hr	Removal	N/A	

1 For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, ... or other appropriate designation.
2 For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.
3 When required by rule.
4 New, modification, removal, existing.
5 For Control Devices use the following numbering system: 1C, 2C, 3C, ... or other appropriate designation.
6 For ERDs use the following numbering system: 1D, 2D, 3D, ... or other appropriate designation.

Notes:

1. Increase in condensate and produced water production. Not a physical change.
2. Increase in number of hauling trips due to increase in condensate and produced water production.
3. Existing - represented in current air permit.
4. These emission units for removal from the current permit were not installed.

Attachment J
Fugitive Emissions Summary Sheet

ATTACHMENT J – FUGITIVE EMISSIONS SUMMARY SHEET

Sources of fugitive emissions may include loading operations, equipment leaks, blowdown emissions , etc.
Use extra pages for each associated source or equipment if necessary.

Source/Equipment:

Leak Detection Method Used	☐ Audible, visual, and olfactory (AVO) inspections	☑ Infrared (FLIR) cameras	☐ Other (please describe)	☐ None required

Component Type	Closed Vent System	Count	Source of Leak Factors (EPA, other (specify))	Stream type (gas, liquid, etc.)	Estimated Emissions (tpy)			
					VOC	HAP	GHG (methane)	GHG (CO2e)
Valves	☐ Yes ☑ No	350	EPA	gas	1.807	0.202	10.611	265.283
Valves	☐ Yes ☑ No	364	EPA	liquid	8.562	0.600	0.069	1.736
Connections (Not sampling)	☐ Yes ☑ No	413	EPA	gas	0.095	0.011	0.557	13.913
Flanges	☐ Yes ☑ No	91	EPA	gas	0.041	0.005	0.239	5.978

1 Other equipment types may include compressor seals, relief valves, diaphragms, drains, meters, etc.

Please provide an explanation of the sources of fugitive emissions (e. g. pigging operations, equipment blowdowns, pneumatic controllers, etc.)

Please indicate if there are any closed vent bypasses (include component)

Specify all equipment used in the closed vent system (e. g. VRU, ERD, thief hatches, tanker truck loading, etc.)

Attachment K
Gas Well Affected Facility Data Sheet

ATTACHMENT K – 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).

API Number	Date of Flowback	Date of Well Completion	Green Completion and/or Combustion Device	Subject to OOOO or OOOOa?
	5/16/2019	4/30/2019	Green	OOOOa
	5/16/2019	5/3/2019	Green	OOOOa
No API Numbers yet	5/16/2019	5/8/2019	Green	OOOOa
	5/16/2019	5/11/2019	Green	OOOOa
	5/16/2019	5/8/2019	Green	OOOOa
	5/16/2019	5/4/2019	Green	OOOOa
	5/16/2019	4/29/2019	Green	OOOOa

Note: If future wells are planned and no API number is available please list as PLANNED.
If there are existing wells that commenced construction prior to August 23, 2011, please acknowledge as existing.

This is the same API (American Petroleum Institute) 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 application without the state code (047).

Every oil and gas well permitted in West Virginia since 1929 has been issued an API 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.

Attachment L
Storage Vessels Data Sheet

ATTACHMENT L – STORAGE VESSEL DATA SHEET

Complete this data sheet if you are the owner or operator of a storage vessel that contains condensate and/or produced water. This form must be completed for each new or modified bulk liquid storage vessel(s) that contains condensate and/or produced water . (If you have more than one (1) identical tank (i.e. 4-400 bbl condensate tanks), then you can list all on one (1) data sheet). **Include gas sample analysis, flashing emissions, working and breathing losses, USEPA Tanks, simulation software (ProMax, E&P Tanks, HYSYS, etc.), and any other supporting documents where applicable.**

The following information is REQUIRED:

☐ Composition of the representative sample used for the simulation
☐ For each stream that contributes to flashing emissions:
- ☐ Temperature and pressure (inlet and outlet from separator(s))
- ☐ Simulation-predicted composition
- ☐ Molecular weight
- ☐ Flow rate

☐ Resulting flash emission factor or flashing emissions from simulation
☐ Working/breathing loss emissions from tanks and/or loading emissions if simulation is used to quantify those emissions

Additional information may be requested if necessary.

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name: Tanks	2. Tank Name: Condensate Tank 001-004
3. Emission Unit ID number: TANKCOND001-004	4. Emission Point ID number. EP-EC001, EP-EC002
5. Date Installed , Modified or Relocated (for existing tanks)	6. Type of change:
2018 Was the tank manufactured after August 23, 2011 and on or before September 18, 2015? ☐ Yes ☑ No Was the tank manufactured after September 18, 2015? ☑ Yes ☐ No	☑ New construction ☐ New stored material ☐ Other ☐ Relocation

7A. Description of Tank Modification (if applicable)

7B. Will more than one material be stored in this tank? If so, a separate form must be completed for each material.
☐ Yes ☑ No

7C. Was USEPA Tanks simulation software utilized?
☐ Yes ☑ No

If Yes, please provide the appropriate documentation and items 8-42 below are not required.

TANK INFORMATION

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 400bbls

9A. Tank Internal Diameter (ft): 12	9B. Tank Internal Height (or Length) (ft): 20
10A. Maximum Liquid Height (ft): 18	10B. Average Liquid Height (ft): 10
11A. Maximum Vapor Space Height (ft): 18	11B. Average Vapor Space Height (ft): 10

12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights.: 400bbls

13A. Maximum annual throughput (gal/yr): 9,657,900	13B. Maximum daily throughput (gal/day): 26,460
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 144	15. Maximum tank fill rate (gal/min) 168

16. Tank fill method ☐ Submerged ☑ Splash ☐ Bottom Loading

17. Is the tank system a variable vapor space system? ☐ Yes ☑ 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):

☑ Fixed Roof ☑ vertical ☐ horizontal ☑ flat roof ☐ cone roof ☐ dome roof ☐ other (describe)
☐ External Floating Roof ☐ pontoon roof ☐ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting
☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm
☐ Pressurized ☐ spherical ☐ cylindrical
☐ other

ATTACHMENT L – STORAGE VESSEL DATA SHEET

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

- ☐ Does Not Apply
- ☐ Inert Gas Blanket of
- ☑ Vent to Vapor Combustion Device (vapor combustors, flares, thermal oxidizers, enclosed combustors)
- ☐ Conservation Vent (psig)

Vacuum Setting Pressure Setting

- ☐ Emergency relief Valve (psig)

Vacuum Setting Pressure Setting

- ☐ Thief Hatch Weighted ☐ Yes ☐ No

Complete appropriate Air Pollution Control Device Sheet

20. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name	Flashing Loss		Breathing Loss		Working Loss		Total Emission Loss		[1] Estimation Method
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Please see Table 6 and Table 7									

TANK CONSTRUCTION & OPERATION INFORMATION

21. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated ☑ Other (describe): Steel

21A. Shell Color: Green | 21B. Roof Color: Green | 21C. Year Last Painted 2018

22. Shell Condition (if metal and unlined):
☑ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated?
☐ Yes ☑ No

22B. If yes, operating temperature:

22C. If yes, how is heat provided to tank?

23. Operating Pressure Range (psig): 0 psig, atmospheric
Must be listed for tanks using VRUs with closed vent system

24. Is the tank a Vertical Fixed Roof Tank?
☑ Yes ☐ No

24A. If yes, for dome roof provide radius (ft): NA

24B. If yes, for cone roof, provide slop (ft/ft): NA

25. Complete the following section for **Floating Roof Tanks** Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type:
☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient seal
☐ Vapor mounted resilient seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ Yes ☐ No

25D. If YES, how is the secondary seal mounted? (check one)
☐ Shoe ☐ Rim ☐ Other (describe)

25E. Is the Floating Roof equipped with a weather shield? ☐ Yes ☐ No

25F. Describe deck fittings

26. Complete the following section for Internal Floating Roof Tanks ☑ Does not apply

26A. Deck Type: ☐ Bolted ☐ Welded

26B. For bolted decks, provide deck construction

26C. Deck seam:
☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft wide ☐ 5 x 12 ft wide ☐ Other (describe)

26D. Deck seam length (ft)

26E. Area of deck (ft^2)

26F. For column supported tanks:
Number of columns:

26G. For column supported tanks, Diameter of each column:

27. Closed Vent System with VRU ☐ Yes ☑ No

28. Closed Vent System with Enclosed Combustor? ☑ Yes ☐ No

ATTACHMENT L – STORAGE VESSEL DATA SHEET

SITE INFORMATION

29. Provide the city and state on which the data in this section are based.: West Union, WV			
30. Daily Average Ambient Temperature (°F):	72.10	31. Annual Average Maximum Temperature (°F):	75.94
32. Annual Average Minimum Temperature (°F):	46.56	33. Average Wind Speed (miles/hr): 18.5 mph	
34. Annual Average Solar Insulation Factor (BTU/(ft2·day))	1030.235999	35. Atmospheric Pressure (psia): 14.8 (based off local conditions, could not find annual)	

LIQUID INFORMATION

36. Average daily temperature range of bulk liquid (F):	72.10	36A. Minimum (°F):	46.56	36B. Maximum (°F)	75.94
37. Average operating pressure range of tank (psig):	atmosphere	37A. Minimum (psig)	0	37B. Maximum (psig)	atmosphere

38A. Minimum Liquid Surface Temperature (°F)	46.56	38B. Corresponding Vapor Pressure (psia)	2.9043
39A. Average Liquid Surface Temperature (°F)	72.10	39B. Corresponding Vapor Pressure (psia)	4.6968
40A. Maximum Liquid Surface Temperature (°F)	75.94	40B. Corresponding Vapor Pressure (psia)	5.0290

41. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

41A. Material Name or Composition	Condensate		
41B. CAS Number	mix of HC		
41C. Liquid Density (lb/gal)	5.9300		
41D. Liquid Molecular Weight (lb/lb-mole)	106.50		
41E. Vapor Molecular Weight (lb/lb-mole)	39.6915		
Maximum Vapor Pressure 41F. True (psia)	5.0290		
41G. Reid (psia)	6.09		
Months Storage per Year 41H. From - To	year round		
Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations 42.	50 psig; 70 F		

ATTACHMENT L – STORAGE VESSEL DATA SHEET

Complete this data sheet if you are the owner or operator of a storage vessel that contains condensate and/or produced water. This form must be completed for each new or modified bulk liquid storage vessel(s) that contains condensate and/or produced water . (If you have more than one (1) identical tank (i.e. 4-400 bbl condensate tanks), then you can list all on one (1) data sheet). **Include gas sample analysis, flashing emissions, working and breathing losses, USEPA Tanks, simulation software (ProMax, E&P Tanks, HYSYS, etc.), and any other supporting documents where applicable.**

The following information is REQUIRED:

☐ Composition of the representative sample used for the simulation
☐ For each stream that contributes to flashing emissions:
- ☐ Temperature and pressure (inlet and outlet from separator(s))
- ☐ Simulation-predicted composition
- ☐ Molecular weight
- ☐ Flow rate

☐ Resulting flash emission factor or flashing emissions from simulation
☐ Working/breathing loss emissions from tanks and/or loading emissions if simulation is used to quantify those emissions

Additional information may be requested if necessary.

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name: Tanks	2. Tank Name: Produced Water Tank 001-002
3. Emission Unit ID number: TANKPW001-002	4. Emission Point ID number. EP-EC001, EP-EC002
5. Date Installed , Modified or Relocated (for existing tanks)	6. Type of change:
2018	☑ New construction ☐ New stored material ☐ Other
Was the tank manufactured after August 23, 2011 and on or before September 18, 2015? ☐ Yes ☑ No	☐ Relocation
Was the tank manufactured after September 18, 2015? ☑ Yes ☐ No	

7A. Description of Tank Modification (if applicable)

7B. Will more than one material be stored in this tank? If so, a separate form must be completed for each material.
☐ Yes ☑ No

7C. Was USEPA Tanks simulation software utilized?

☐ Yes ☑ No

If Yes, please provide the appropriate documentation and items 8-42 below are not required.

TANK INFORMATION

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 400bbls

9A. Tank Internal Diameter (ft): 12	9B. Tank Internal Height (or Length) (ft): 20
10A. Maximum Liquid Height (ft): 18	10B. Average Liquid Height (ft): 10
11A. Maximum Vapor Space Height (ft): 18	11B. Average Vapor Space Height (ft): 10

12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights.: 400bbls

13A. Maximum annual throughput (gal/yr): 61,320,000	13B. Maximum daily throughput (gal/day): 168,000
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 1825	15. Maximum tank fill rate (gal/min) 168

16. Tank fill method ☐ Submerged ☑ Splash ☐ Bottom Loading

17. Is the tank system a variable vapor space system? ☐ Yes ☑ 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):

☑ Fixed Roof ☑ vertical ☐ horizontal ☑ flat roof ☐ cone roof ☐ dome roof ☐ other (describe)
☐ External Floating Roof ☐ pontoon roof ☐ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ☐ vertical column support ☐ self-supporting
☐ Variable Vapor Space ☐ lifter roof ☐ diaphragm
☐ Pressurized ☐ spherical ☐ cylindrical

ATTACHMENT L – STORAGE VESSEL DATA SHEET

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☐ Does not apply ☐ Rupture Disc (psig)

☐ Inert Gas Blanket ☐ Carbon Adsorption

☑ Vent to Vapor Combustion Device (vapor combustors, flares, thermal oxidizers, enclosed combustors)

☐ Conservation Vent (psig)
Vacuum Setting Pressure Setting

☐ Emergency relief Valve (psig)
Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☐ No

Complete appropriate Air Pollution Control Device Sheet

20. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name	Flashing Loss		Breathing Loss		Working Loss		Total Emission Loss		[1] Estimation Method
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Please see Table 6 and Table 7									

TANK CONSTRUCTION & OPERATION INFORMATION

21. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated ☑ Other(describe): Steel

21A. Shell Color: Green	21B. Roof Color: Green	21C. Year Last Painted 2018

22. Shell Condition (if metal and unlined):
☑ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ Yes ☑ No	22B. If yes, operating temperature:	22C. If yes, how is heat provided to tank?

23. Operating Pressure Range (psig): 0 psig, atmospheric
Must be listed for tanks using VRUs with closed vent system

24. Is the tank a Vertical Fixed Roof Tank? ☑ Yes ☐ No	24A. If yes, for dome roof provide radius (ft): NA	24B. If yes, for cone roof, provide slop (ft/ft): NA

25. Complete the following section for **Floating Roof Tanks** Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: ☐ Metallic (mechanical) shoe seal ☐ Liquid mounted resilient ☐ Vapor mounted resilient seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ Yes ☐ No

25D. If YES, how is the secondary seal mounted? (check one)
☐ Shoe ☐ Rim ☐ Other(describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ Yes ☐ No

25F. Describe deck fittings

26. Complete the following section for Internal Floating Roof Tanks ☑ Does not apply

26A. Deck Type: ☐ Bolted ☐ Welded	26B. For bolted decks, provide deck construction

26C. Deck seam:
☐ 5 ft. wide ☐ 6 ft. wide ☐ 7 ft. wide ☐ 5 x 7.5 ft. wide ☐ 5 x 12 ft. wide ☐ Other (describe)

26D. Deck seam length (ft)	26E. Area of deck (ft^2)	26F. For column supported tanks: Number of columns:	26G. For column supported tanks, Diameter of each column:

27. Closed Vent System with VRU ☐ Yes ☑ No

28. Closed Vent System with Enclosed Combustor? ☑ Yes ☐ No

ATTACHMENT L – STORAGE VESSEL DATA SHEET

SITE INFORMATION

29. Provide the city and state on which the data in this section are based.: West Union, WV			
30. Daily Average Ambient Temperature (°F):	72.10	31. Annual Average Maximum Temperature (°F):	75.94
32. Annual Average Minimum Temperature (°F):	46.56	33. Average Wind Speed (miles/hr): 5.9 mph	
34. Annual Average Solar Insulation Factor (BTU/(ft2·day))	1030.236	35. Atmospheric Pressure (psia): 14.8 (based off local conditions, could not find annual)	

LIQUID INFORMATION

36. Average daily temperature range of bulk liquid (F):	72.10	36A. Minimum (°F):	46.56	36B. Maximum (°F)	75.94
37. Average operating pressure range of tank (psig):	atmosphere	37A. Minimum (psig)	0	37B. Maximum (psig)	atmosphere

38A. Minimum Liquid Surface Temperature (°F)	46.56	38B. Corresponding Vapor Pressure (psia)	0.2280
39A. Average Liquid Surface Temperature (°F)	72.10	39B. Corresponding Vapor Pressure (psia)	0.4525
40A. Maximum Liquid Surface Temperature (°F)	75.94	40B. Corresponding Vapor Pressure (psia)	0.4988

41. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

41A. Material Name or Composition	Produced Water		
41B. CAS Number	mix of HC and water		
41C. Liquid Density (lb/gal)	8.3300		
41D. Liquid Molecular Weight (lb/lb-mole)	18.46		
41E. Vapor Molecular Weight (lb/lb-mole)	18.4577		
Maximum Vapor Pressure 41F. True (psia)	0.4988		
41G. Reid (psia)	1.0333		
Months Storage per Year 41H. From - To	year round		
Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations 42.	169 psig 70 F		

Attachment M
Natural Gas Fired Fuel Burning Unit(s)
Data Sheet

ATTACHMENT M – SMALL HEATERS AND REBOILERS NOT SUBJECT TO 40CFR60 SUBPART DC
DATA SHEET

Complete this data sheet for each small heater and reboiler not subject to 40CFR60 Subpart Dc at the facility. ***The Maximum Design Heat Input (MDHI) must be less than 10 MMBTU/hr.***

Emission Unit ID#	Emission Point ID#	Emission Unit Description (Manufacturer, model#)	Year Installed/ Modified	Type and Date of Change	Maximum Design Heat Input (MMBTU/hr)	Fuel Heating Value (BTU/scf)
GPU001	EP-GPU001	Gas Production Unit Heater	2019	New	1.5	1179.83
GPU002	EP-GPU002	Gas Production Unit Heater	2019	New	1.5	1179.83
GPU003	EP-GPU003	Gas Production Unit Heater	2019	New	1.5	1179.83
GPU004	EP-GPU004	Gas Production Unit Heater	2019	New	1.5	1179.83
GPU005	EP-GPU005	Gas Production Unit Heater	2019	New	1.5	1179.83
GPU006	EP-GPU006	Gas Production Unit Heater	2019	New	1.5	1179.83
GPU007	EP-GPU007	Gas Production Unit Heater	2019	New	1.5	1179.83
LH-2	2E	Gas Production Unit Heater		Removal [a]	1	1179.83
LH-3	3E	Gas Production Unit Heater		Removal [a]	1	1179.83
LH-4	4E	Gas Production Unit Heater		Removal [a]	1	1179.83
LH-5	5E	Gas Production Unit Heater		Removal [a]	1	1179.83
LH-6	6E	Gas Production Unit Heater		Removal [a]	1	1179.83
LH-7	7E	Gas Production Unit Heater		Removal [a]	1	1179.83
LH-8	8E	Gas Production Unit Heater		Removal [a]	1	1179.83
LH001	EP-LH001	Line Heater	2019	New	2	1179.83
LH002	EP-LH002	Line Heater	2019	New	2	1179.83
LH003	EP-LH003	Line Heater	2019	New	2	1179.83
LH004	EP-LH004	Line Heater	2019	New	2	1179.83
LH005	EP-LH005	Line Heater	2019	New	2	1179.83
LH006	EP-LH006	Line Heater	2019	New	2	1179.83
LH007	EP-LH007	Line Heater	2019	New	2	1179.83
LH-1	EP-LH-1	Line Heater		Removal [a]	2.5	1179.83

Note: a - The Gas Production Unit Heaters and Line Heater for removal from the current permit were not installed.

1. Enter the appropriate Emission Unit (or Source) identification number 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. Enter design heat input capacity in MMBtu/hr.
5. Enter the fuel heating value in BTU/standard cubic foot.

Attachment N
Internal Combustion Engine Data Sheet

ATTACHMENT N – INTERNAL COMBUSTION ENGINE DATA SHEET

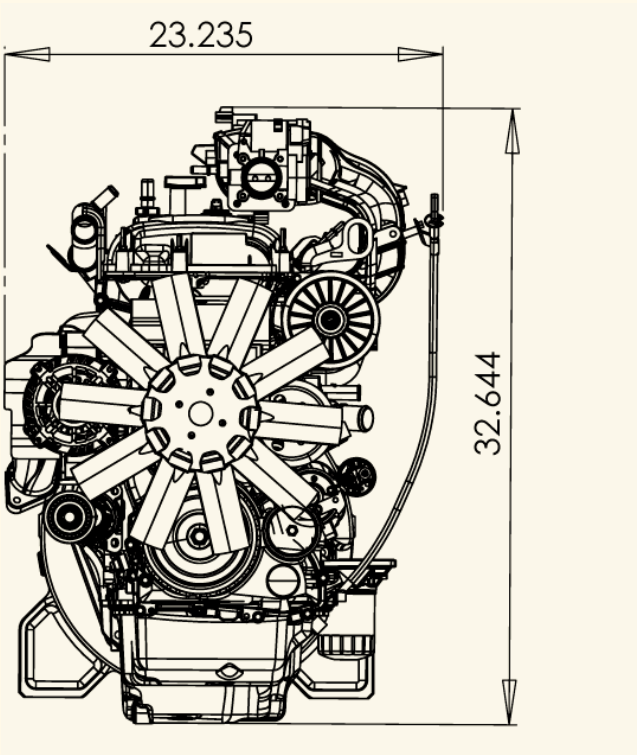
Complete this data sheet for each internal combustion engine at the facility. Include manufacturer performance data sheet(s) or any other supporting document if applicable. Use extra pages if necessary. *Generator(s) and microturbine generator(s) shall also use this form.*

Emission Unit ID#	ENG001-002	CE-1	CE-2	TG-1, TG-2
Engine Manufacturer/Model	Ford MSG425 2.5L Engine	Arrow VRG 330	Waukesha F3524 GSI	Thermoelectric Generator (Global Model 5120)
Manufacturers Rated bhp/rpm	76 HP @ 3200 rpm	68HP @ 1800 rpm	840 HP @ 1400 rpm	0
Source Status	NS	REM	REM	REM
Date Installed/ Modified/ Removed/ Relocated	2019	2018	2018	2018
Engine Manufacturer/ Reconstruction Date	2015	1998	2007	0
Check all applicable Federal Rules for the engine (include EPA Certification of Conformity if applicable)	☑ 40CFR60 Subpart JJJJ ☑ JJJJ Certified? ☐ 40CFR60 Subpart IIII ☐ IIII Certified? ☑ 40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐ 40CFR60 Subpart JJJJ ☐ JJJJ Certified? ☐ 40CFR60 Subpart IIII ☐ IIII Certified? ☑ 40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☑ 40CFR60 Subpart JJJJ ☐ JJJJ Certified? ☐ 40CFR60 Subpart IIII ☐ IIII Certified? ☑ 40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources	☐ 40CFR60 Subpart JJJJ ☐ JJJJ Certified? ☐ 40CFR60 Subpart IIII ☐ IIII Certified? ☐ 40CFR63 Subpart ZZZZ ☐ NESHAP ZZZZ/NSPS JJJJ Window ☐ NESHAP ZZZZ Remote Sources
Engine Type	4SRB	4SRB	4SRB	N/A
APCD Type	NSCR	NSCR	OxCat	N/A
Fuel Type	RG	PQ	PQ	RG
H2S (gr/ 100 scf)	0	0.25	0.25	0
Operating bhp/rpm	50 HP @ 2300 rpm	68HP @ 1800 rpm	840HP @ 1400 rpm	N/A
BSFC (BTU/bhp-hr)	8141	8038	8332	N/A
Hourly Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	345 ft^3/hr gal/hr	536.00 ft^3/hr gal/hr	4910.00 ft^3/hr gal/hr	12.96 ft^3/hr gal/hr
Fuel Usage or Hours of Operation Metered	3.0222 $MMft^3/yr$ gal/yr	4.700 $MMft^3/yr$ gal/yr	43.02 $MMft^3/yr$ gal/yr	0.113515 $MMft^3/yr$ gal/yr

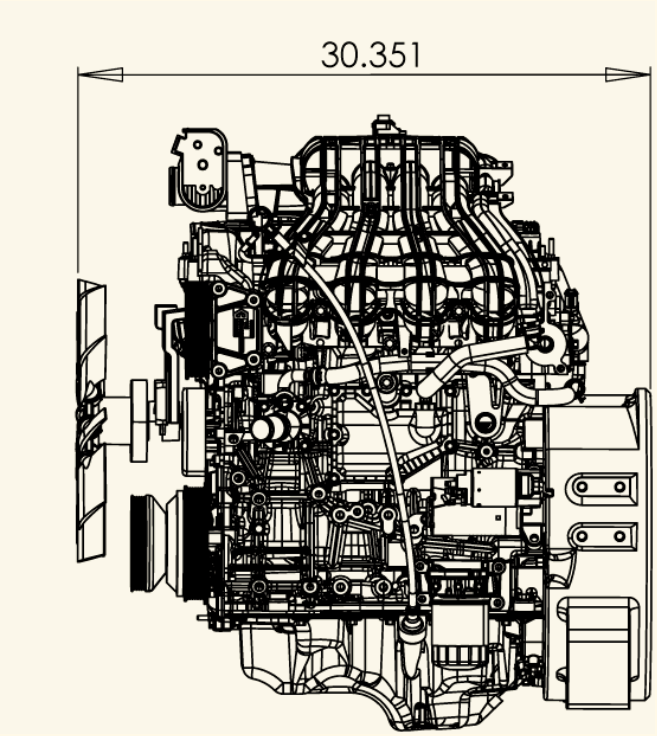
Calculation Methodology	Pollutant	Hourly PTE (lb/hr)	Annual PTE (tons/year)	Hourly PTE (lb/hr)	Annual PTE (tons/year)	Hourly PTE (lb/hr)	Annual PTE (tons/year)	Hourly PTE (lb/hr)	Annual PTE (tons/year)
MD	NOx	0.1250	0.5477	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MD	CO	0.8253	3.6146	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AP	VOC	0.0366	0.1604	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AP	SO2	0.0007	0.0032	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AP	PM10	0.0118	0.0515	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AP	Formaldehyde	0.0254	0.1111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AP	Total HAPs	0.0284	0.1244	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
OT	GHG (CO2e)	143.2297	627.3461	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Installation Drawings

Front End View

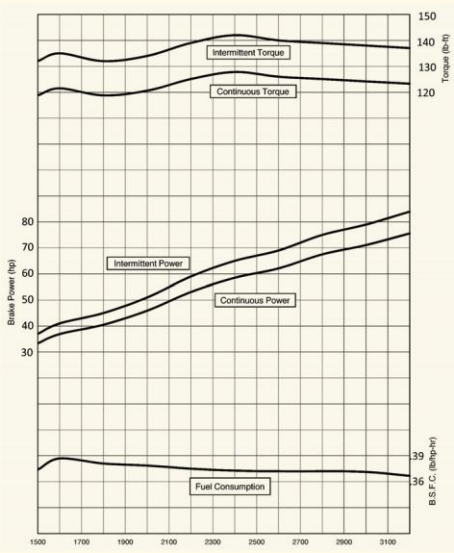


Left Side View

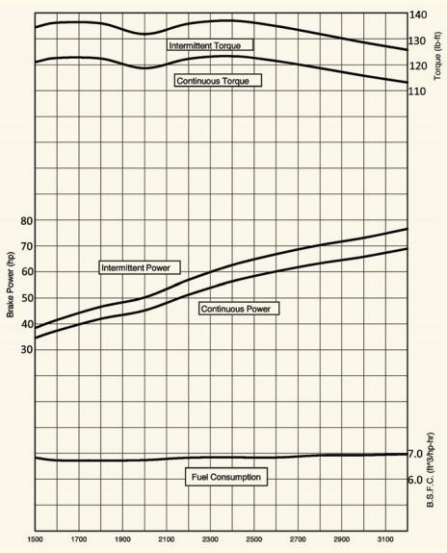


Power Curves (corrected per SAE J1349)

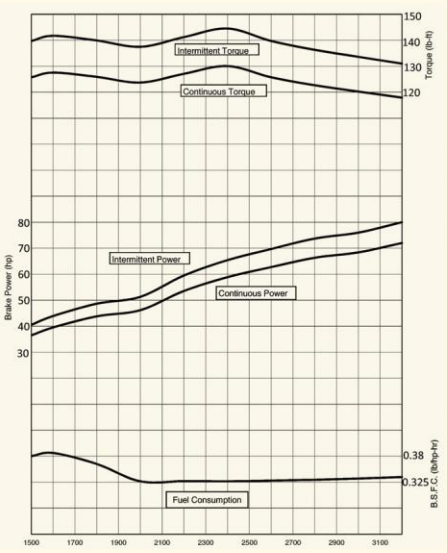
Gasoline



Natural Gas



Liquefied Petroleum Gas



Ford Power Products

Powertrain Assemblies & Components Provided By Ford Component Sales

MSG-425 EFI

2.5 Liter 4-Cylinder

Options

Engine Cooling Fans
- 15" (381mm) diameter suction
- 15" (381mm) diameter pusher

Flywheels
- 10" (254mm) SAE over-center clutch
- flat face flywheel

Flywheel Housings
- SAE #4

Exhaust Manifold
- rear dump down

Power Steering Pump

Wiring Harnesses

Discrete Speed Switch

Variable Speed Hand Throttle

Variable Speed Foot Pedal

Engine Mounts
- Automotive with insulators
- Open power unit

Electronic Instrument Panel, Gauges

Three Way Catalyst / Muffler Standard

Transmissions

6R80 electronic shift
C6 Mechanical

Emissions Information

California Air Resources Board (CARB)
Environmental Protection Agency (EPA)
Emission Certified Packages Available.

Warranty

Contact Engine Distributors, Inc for warranty details.

Power Products

Powertrain Assemblies & Components Provided By Ford Component Sales

Specifications

Engine Type	I-4
Bore and Stroke	3.5" x 3.93" (89mm x 100mm)
Displacement	2.5L Liter (152.5 CID)
Compression Ratio	9.7:1
Oil Capacity	7 qts. including filter
Net Weight	351 Lbs. with accessories (159 Kgs.)
Dimensions	L 30.3" x W 23.3" x H 32.6" (769 mm x 589 mm x 828 mm)

Gasoline (corrected per SAE J1349)

Unleaded 87 or 89 octane

Intermittent Power	84 [HP] @ 3200rpm	(62 [kW] @ 3200rpm)
Continuous power	75 [HP] @ 3200rpm	(56 [kW] @ 3200rpm)
Intermittent Torque	137 [ft-lbs] @3200rpm	(185 [N-m] @ 3200rpm)
Continuous Torque	123 [ft-lbs] @3200rpm	(166 [N-m] @ 3200rpm)

Natural Gas (corrected per SAE J1349)

Fuel Specification	1050 BTU/FT3	
Intermittent Power	76 [HP] @ 3200rpm	(56 [kW] @ 3200rpm)
Continuous power	68 [HP] @ 3200rpm	(50 [kW] @ 3200rpm)
Intermittent Torque	125 [ft-lbs] @3200rpm	(169 [N-m] @ 3200rpm)
Continuous Torque	113 [ft-lbs] @3200rpm	(153 [N-m] @ 3200rpm)

Liquefied Petroleum Gas (corrected per SAE J1349)

Fuel Specification	HD-5	
Intermittent Power	80 [HP] @ 3200rpm	(59 [kW] @ 3200rpm)
Continuous power	72 [HP] @ 3200rpm	(53 [kW] @ 3200rpm)
Intermittent Torque	131 [ft-lbs] @3200rpm	(177 [N-m] @ 3200rpm)
Continuous Torque	118 [ft-lbs] @3200rpm	(160 [N-m] @ 3200rpm)

Standard Features / Benefits

Set-for-life valvetrain

Deep skirted, ribbed cylinder block casting for rigidity

Aluminum AA319 cylinder block cast with the Cosworth process, including cast-in-place iron cylinder liners.

Chain driven dual camshafts with automatic tensioning system

Structural front cover and oil pan

Alternate fuel ready valvetrain components

Individual coil on plug electronic ignition

Cast aluminum camshaft cover to ensure warp-free sealing

Sintered metal connecting rods

Nodular iron crankshaft, featuring five main bearings, eight counterweights

Broadband knock sensor, calibrated for individual cylinder use

Gasoline Sequential Port Fuel Injection

Closed loop fuel control for all fuels

Electronic engine management system with built-in engine protection against detonation, high coolant temperature, low oil pressure, over speed shutdown and starter lockout

Next generation governing - discrete speeds, variable speeds, drive by wire - using the highest quality components.

California Environmental Protection Agency **Air Resources Board**	**ENGINE DISTRIBUTORS, INC.**	**EXECUTIVE ORDER U-L-034-0028** New Off-Road Large Spark-Ignition Engines Above 19 Kilowatts

Pursuant to the authority vested in the Air Resources Board by the Health and Safety Code, Division 26, Part 5, Chapters 1 and 2; and

Pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-14-012;

IT IS ORDERED AND RESOLVED: That the following new large spark-ignition engines and emission control systems produced by the manufacturer are certified for use in off-road equipment as described below. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY NAME	ENGINE DISPLACEMENT (liters)	FUEL TYPE
2015	FEDIB02.5MSG	2.5	Gasoline, LPG, CNG, Gasoline-LPG Dual Fuel

DURABILITY HOURS	SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT USAGE
5000	Three-Way Catalytic Converter, Heated Oxygen Sensor, Sequential Multiport Fuel Injection (Gas), Gaseous Fuel Mixer (LPG, CNG)	Forklift, Aerial Lift, Generator, Compressor, Pump, Other Industrial Equipment

ENGINE MODELS (rated power in kilowatt, kW)	MSG425-DF (64.3 kW), MSG425-GAS (64.3 kW), MSG425-LPG (59.8 kW), MSG425-LP VAPOR (59.8 kW), MSG425-NG (57.3 kW)

The following are the hydrocarbon plus oxides of nitrogen (HC+NOx) and carbon monoxide (CO) exhaust certification emission standards (Title 13, California Code of Regulations, (13 CCR) Section 2433(b)(1)) and certification emission levels for this engine family in grams per kilowatt-hour (g/kW-hr). Engines within this engine family shall have closed crankcases in conformance with 13 CCR Section 2433(b)(3).

(g/kW-hr)	HC+NOx	CO
Exhaust Standards	0.8	20.6
Certification Levels	0.5	3.3

The following is the evaporative hydrocarbon emission standard (13 CCR Section 2433(b)(4)) and certification emission level for this engine family in grams per gallon of fuel tank capacity (g/gallon).

Evaporative Certification Method	HC Certification Level (g/gallon)	HC Certification Standard (g/gallon)
Design Based	N/A	0.2

BE IT FURTHER RESOLVED: That for the listed engines for the aforementioned model-year, the manufacturer has submitted, and the Executive Officer hereby approves, the information and materials to demonstrate certification compliance with 13 CCR Section 2433(c) (certification and test procedures), 13 CCR Section 2434 (emission control labels), and 13 CCR Sections 2435 and 2436 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 14th day of November 2014.

FOR Annette Hebert, Chief
Emissions Compliance, Automotive Regulations and Science Division

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2015 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Engine Distributors, Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: FEDIB02.5MSG-002

Effective Date: 12/09/2014

Expiration Date: 12/31/2015

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 12/09/2014

Revision Date: N/A

Manufacturer: Engine Distributors, Inc.
Engine Family: FEDIB02.5MSG
Certification Type: Mobile and Stationary
Fuel : LPG/Propane
Gasoline (up to and including 10% Ethanol)
Natural Gas (CNG/LNG)
Emission Standards : NMHC + NOx (g/kW-hr) : 0.8
HC + NOx (g/kW-hr) : 0.8
CO (g/kW-hr) : 20.6NMHC + NOx (g/kW-hr) : 0.8
HC + NOx (g/kW-hr) : 0.8
CO (g/kW-hr) : 20.6
Emergency Use Only : N

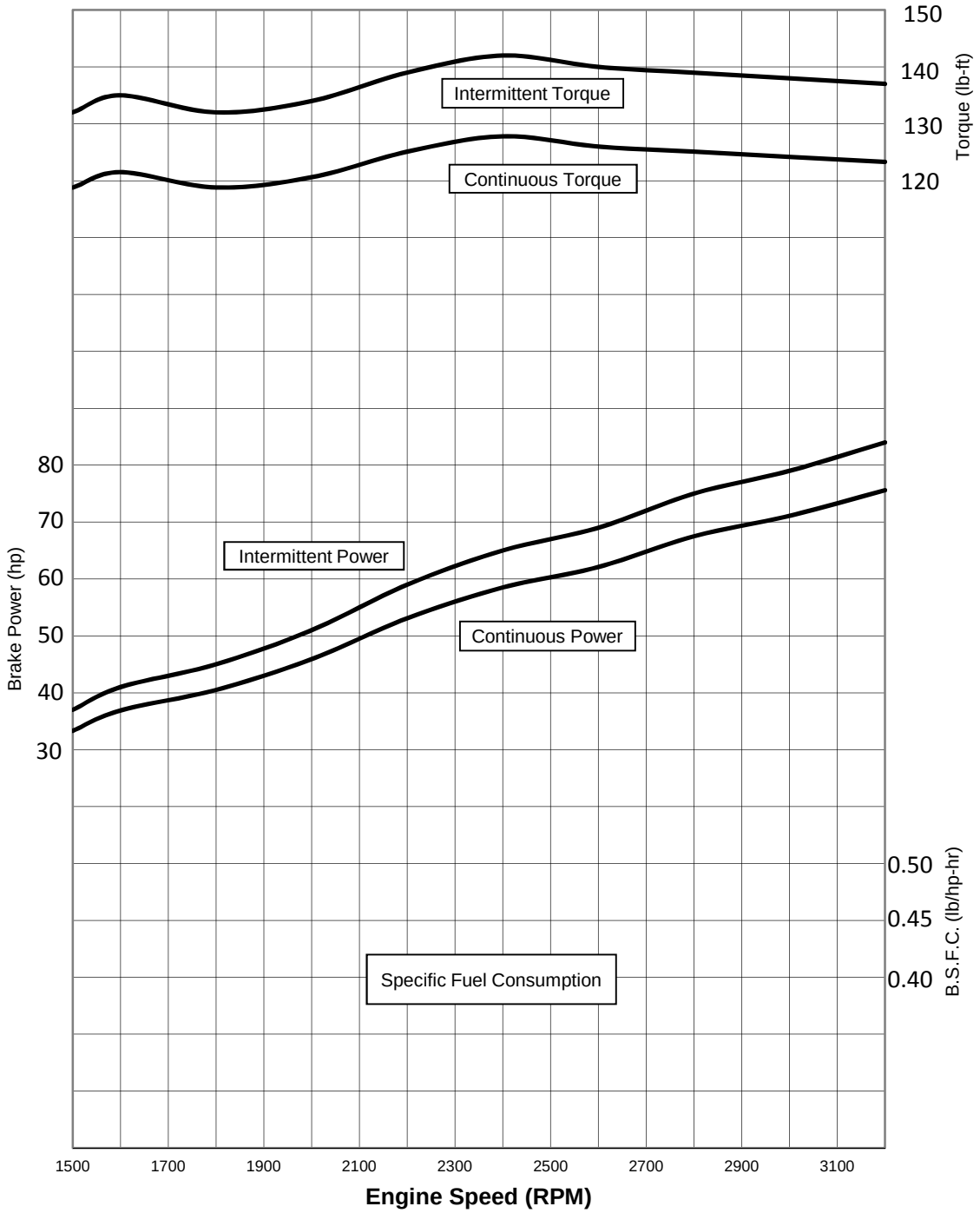
Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 40 CFR Part 1048, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60, 40 CFR Part 1048 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60, 40 CFR Part 1048 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60, 40 CFR Part 1048. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

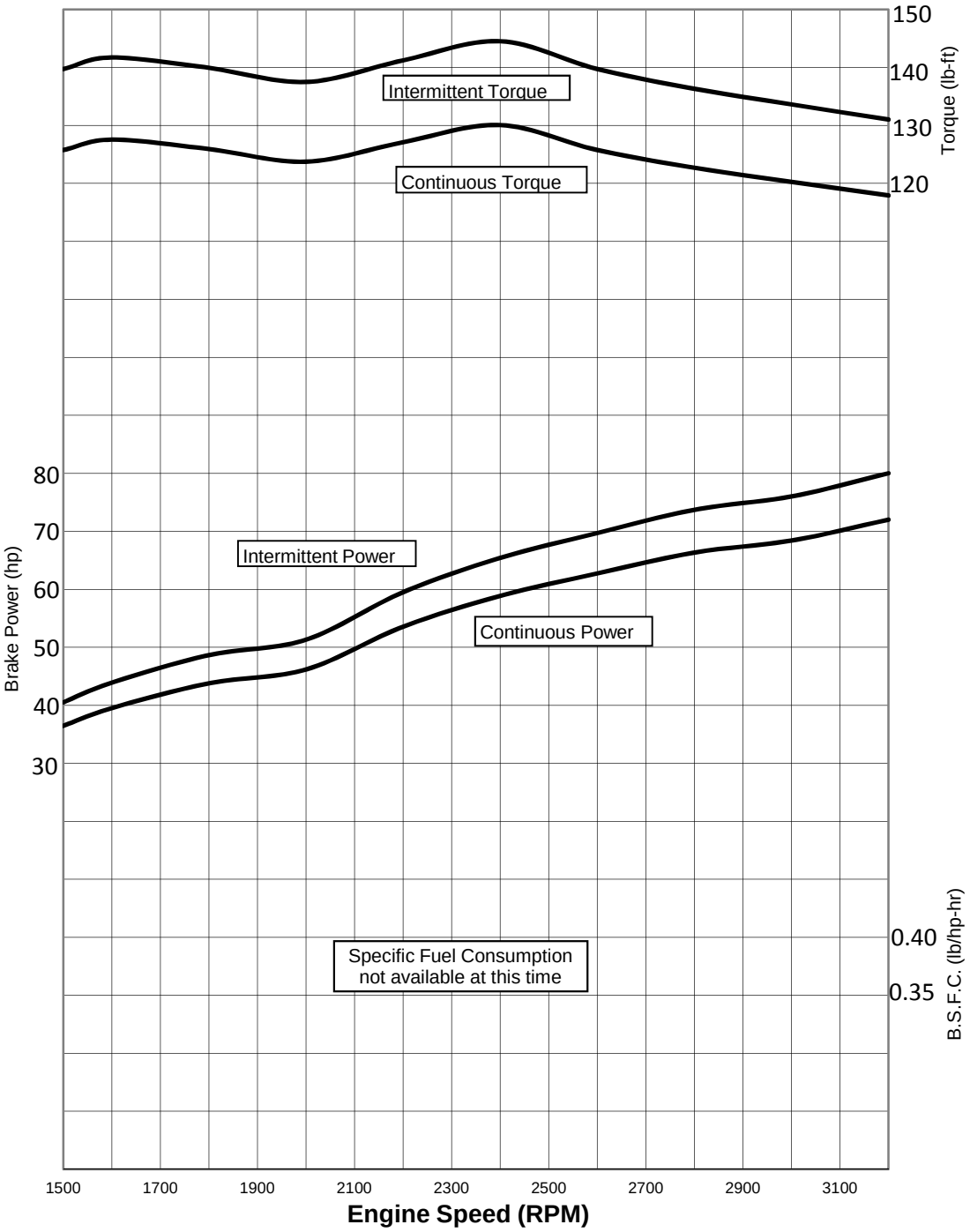
It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60, 40 CFR Part 1048. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60, 40 CFR Part 1048.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

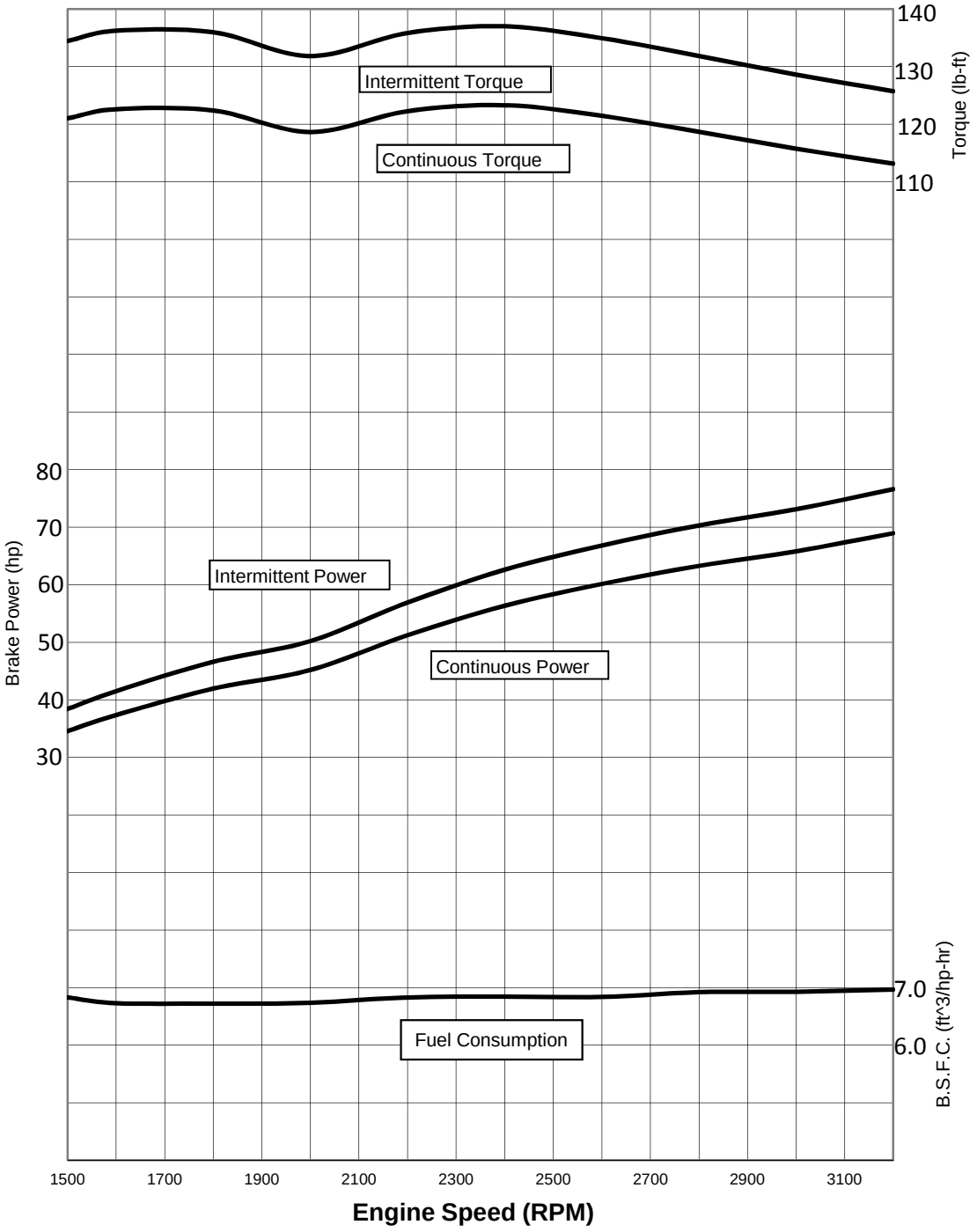
Gasoline


150
140
130
120
Torque (lb-ft)
Intermittent Torque
Continuous Torque
80
70
60
50
40
30
Brake Power (hp)
Intermittent Power
Continuous Power
0.50
0.45
0.40
B.S.F.C. (lb/hp-hr)
Specific Fuel Consumption
1500
1700
1900
2100
2300
2500
2700
2900
3100
Engine Speed (RPM)

LP


150
140
130
120
Torque (lb-ft)
Intermittent Torque
Continuous Torque
80
70
60
50
40
30
Brake Power (hp)
Intermittent Power
Continuous Power
Specific Fuel Consumption
not available at this time
0.40
0.35
B.S.F.C. (lb/hp-hr)
1500
1700
1900
2100
2300
2500
2700
2900
3100
Engine Speed (RPM)

NG


140
130
120
110
Torque (lb-ft)
Intermittent Torque
Continuous Torque
80
70
60
50
40
30
Brake Power (hp)
Intermittent Power
Continuous Power
7.0
6.0
B.S.F.C. (ft^3/hp-hr)
Fuel Consumption
1500
1700
1900
2100
2300
2500
2700
2900
3100
Engine Speed (RPM)

Attachment O
Tanker Truck Loading Data Sheet

ATTACHMENT O – TANKER TRUCK LOADING DATA S HEET

Complete this data sheet for each new or modified bulk liquid transfer area or loading rack at the facility. This is to be used for bulk liquid transfer operations to tanker trucks. Use extra pages if necessary.

Truck Loadout Collection Efficiencies

The following applicable capture efficiencies of a truck loadout are allowed:

- For tanker trucks passing the MACT level annual leak test – 99.2%
- For tanker trucks passing the NSPS level annual leak test – 98.7%
- For tanker trucks not passing one of the annual leak tests listed above – 70%

Compliance with this requirement shall be demonstrated by keeping records of the applicable MACT or NSPS Annual Leak Test certification for ***every*** truck and railcar loaded/unloaded. This requirement can be satisfied if the trucking company provided certification that its entire fleet was compliant. This certification must be submitted in writing to the Director of the DAQ. These additional requirements must be noted in the Registration Application.

Emission Unit ID#:	L001, L002	Emission Point ID#:	EP-L001, EP-L002	Year Installed/ Modified:	2018

Emission Unit Description: Condensate Loading, Produced Water Loading

Loading Area Data

Number of Pumps: 2 | Number of Liquids Loaded: 2 | Max number of trucks loading at one time: 2

Are Tanker trucks pressure tested for leaks at this any other location? ☑ Yes ☐ No ☐ Not Required

If Yes, Please Describe: Tank trucks are pressure tested for leaks at the location of the leak testing company. Trucks are tested using EPA Method 27-internal vapor valve test and issued certification that DOT requirements are met.

Provide description of closed vent system and any bypasses

Are any of the following truck loadout systems utilized? No

☐ Closed System to Tanker Truck passing a MACT level annual leak test?

☐ Closed System to Tanker Truck passing a NSPS level annual leak test?

☐ Closed System to Tanker Truck not passing an annual leak test and has vapor return?

Projected Maximum Operating Schedule (for rack or transfer point as a whole)

Time	Jan - Mar	Apr - Jun	Jul - Sept	Oct - Dec
Hours/day	10	10	10	10
Days/week	7	7	7	7

Bulk Liquid Data (use extra pages as necessary)

Liquid Name		Condensate	Produced Water	
Max. Daily Throughput (1000 gal/day)		26.46	168.00	
Max. Annual Throughput (1000 gal/yr)		9,658	61,320	
Loading Method		BF	BF	
Max. Fill Rate (gal/min)		168	168	
Average Fill Time (min/loading)		50	50	
Max. Bulk Liquid Temperature (F)		72.1	72.1	
True Vapor Pressure		4.7	0.5	
Cargo Vessel Condition		U	U	
Control Equipment or Method		None	None	
Max. Collection Efficiency (%)		0	0	
Max. Control Efficiency (%)		0	0	
Max VOC Emission Rate	Loading (lb/hr)	15.7089	0.0007	
	Annual (ton/yr)	7.5256	0.0022	
Max HAP Emission Rate	Loading (lb/hr)	1.6227	1.03E-05	
	Annual (ton/yr)	0.7774	3.14E-05	
Estimation Method		Promax	Promax	

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 servi O Other (describe)

4 List as many as apply (complete and submit appropriate Air Pollution Control Device Sheets)

CA Carbon Adsorption VB Dedicated Vapor Balance (closed system)

ECD Enclosed Combustion Device F Flare

TO Thermal Oxidization or Incineration

5 EPA EPA Emission Factor in AP-42 MB Material Balance

TM Test Measurement based upon test data submittal O Other (describe)

Attachment Q
Pneumatic Controllers Data Sheet

ATTACHMENT Q – PNEUMATIC CONTROLLERS DATA SHEET

Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

Are there any continuous bleed natural gas driven pneumatic controllers at this facility with a bleed rate greater than 6 standard cubic feet per hour that are required based on functional needs, including but not limited to response time, safety and positive actuation that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list approximate number.

Attachment R
Pneumatic Pump Data Sheet

ATTACHMENT R – PNEUMATIC PUMP DATA SHEET

Are there any natural gas-driven diaphragm pumps located at a well site that commenced construction, modification or reconstruction after September 18, 2015?

☐ Yes ☒ No

Please list.

Source ID #	Date	Pump Make/Model	Pump Size

Attachment S
Air Pollution Control Device – Emission Reduction Device Sheets

ATTACHMENT S – AIR POLLUTION CONTROL DEVICE / EMISSION REDUCTION DEVICE SHEETS

Complete the applicable air pollution control device sheet s for each flare, vapor combustor, thermal oxidizer, condenser, adsorption system, vapor recovery unit , BTEX Eliminator, Reboiler with and without Glow Plug, etc. at the facility. Use extra pages if necessary.

Emissions calculations must be performed using the most conservative control device efficiency.

The following five (5) rows are only to be completed if registering an alternative air pollution control device.

Emission Unit ID:	NA	Make/Model:	NA
Primary Control Device ID:	NA	Make/Model	NA
Control Efficiency (%):	NA	APCD/ERD Data Sheet Completed	☐ Yes ☐ No
Secondary Control Device ID:	NA	Make/Model	NA
Control Efficiency (%):	NA	APCD/ERD Data Sheet Completed	☐ Yes ☐ No

VAPOR COMBUSTION (Including Enclosed Combustors)

General Information

Control Device ID#:	EC001-002	Installation Date: ☑ New ☐ Modified ☐ Relocated	
Maximum Rated Total Flow Capacity: 5458 scfh 131000 scfd		Maximum Design Heating Input (from mfg. spec sheet): 12.0 MMBTU/hr	Design Heat Content: 2300 BTU/scf

Control Device Information

Type of Vapor Combustion Control?

☑ Enclosed Combustion Device ☐ Elevated Flare ☐ Ground Flare ☐ Thermal Oxidizer

Manufacturer: Cimarron Model: 48" HV ECD		Hours of operation per year?	8760

List the emission units whose emissions are controlled by this vapor control device (Emission Point ID# NA

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
TANKCOND001-004	Condensate Tanks		
TANKPW001-002	Produced Water Tanks		

If this vapor combustor controls emissions from more than six (6) emission units, please attach additional pages.

Assist Type (Flares only)	Flare height	Tip Diameter	Was the design per §60.18?
☐ Steam ☐ Air ☐ Pressure ☑ Non	25 feet	3.33 feet	☑ Yes ☐ No Provide determination

Waste Gas Information

Maximum Waste Gas Flow Rate	Heat Value of Waste Gas Stream	Exit Velocity of the Emission Stream
26.17 (scfm)	1,822.78 BTU/ft^3	0.0501 (ft/s)

Please see Attachment S, Tables 6 & 7 for VOC composition/ characteristics of the waste gas stream to be burned.

Pilot Gas Information

Number of Pilot Lights	Fuel Flow Rate to Pilot Flame per Pilot	Heat Input per Pilot	Will automatic re-ignition be used?
2	17 scfh	20057 BTU/hr	☑ Yes ☐ No

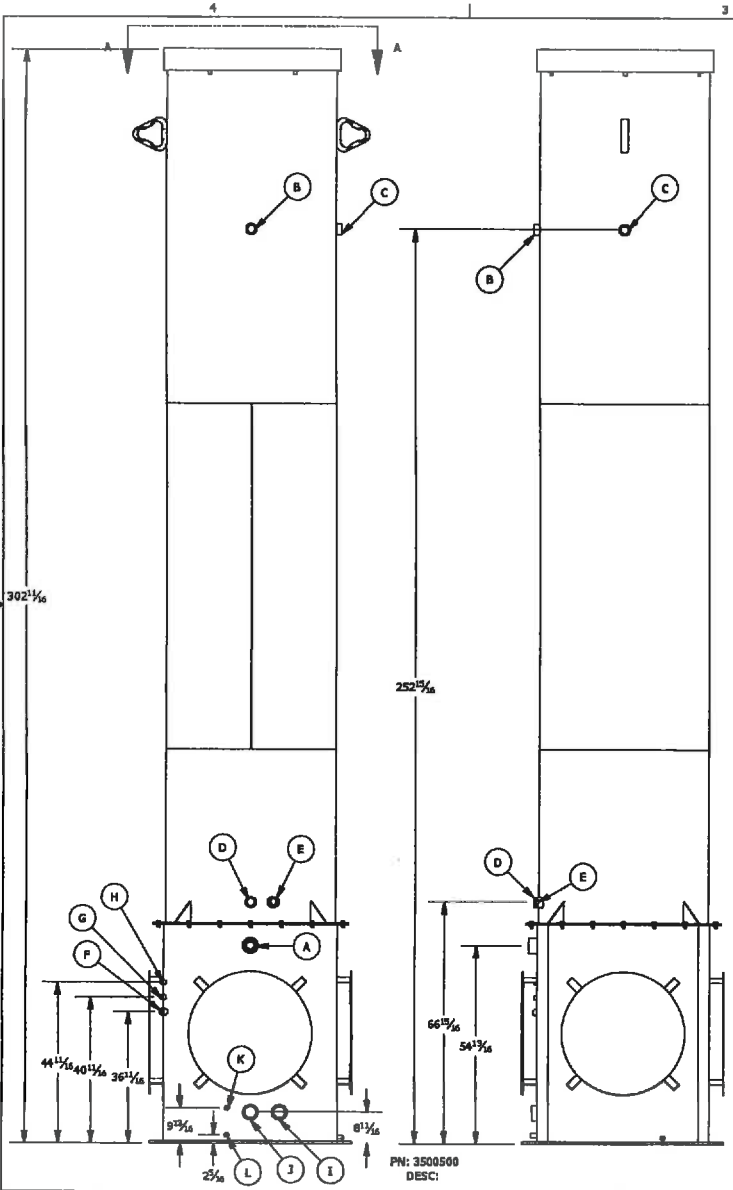
If automatic re-ignition is used, please describe the method. Flame Rectification, a thermocouple equivalent

Is pilot flame equipped with a monitor to detect the presence of the flame?	If Yes, What type?
☑ Yes ☐ No	☐ Thermocouple ☐ Infrared ☐ Ultraviolet ☐ Camera ☑ Other: Flame Ionization Rod

Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty. *(If unavailable, please indicate).*

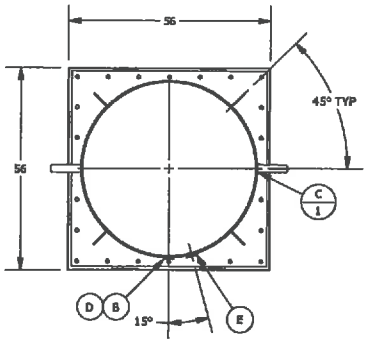
Additional information attached? ☑ Yes ☐ No Manufacturer's specs sheet

Please attach copies of manufacturer's data sheets, drawings, flame demonstration per §60.18 or §63.11 (b) and performance testing.



48" DIA x 302 5/8" HEIGHT, 88 ORIFICES EMISSION CONTROL DEVICE

* >98% TVOC DRE, CERTIFIED USEPA 40 CFR 60, APPENDIX A, SOURCE EMMISIONS TEST METHODS REFERENCED. MEETS ALL EPA & CDPHE REGULATIONS.
* DESTROYS OIL/CONDENSATE PRODUCTION TANK VAPORS W/ NO VISIBLE FLAME.
* EXCELLENT OPACITY AND SMOKELESS OPERATION.
* RELIABLE AND CUSTOMIZABLE IGNITION.
* VERY LOW CAPITAL AND OPERATING COST.
* EASY TO OPERATE AND MAINTAIN.
* FIELD TESTED TO DESTROY UP TO 119.5 MDSCFD (131 MCFD) @ 10 oz/in^2; 2300 BTU/CF WASTE GAS (SG 1.45)
* STRUCTURE CERTIFIED FOR 90 MPH 3-SEC WIND GUST PER ASCE 7-05 & IBC 2006 STANDARDS. HIGHER WIND LOAD RATED STRUCTURES AVAILABLE.



VIEW A-A

PN: 3500500
DESC:

SCHEDULE OF NOZZLES				
MARK	QTY	DESCRIPTION	SERIES	SERVICE
A	1	3" HALF COUPLING	2000#	BURNER WASTE GAS IN
B	1	2" FULL COUPLING	3000#	FLOW TEST/AUTOMATION
C	1	2" FULL COUPLING	3000#	FLOW TEST/AUTOMATION
D	1	2" FULL COUPLING	3000#	SIGHT GLASS
E	1	2" FULL COUPLING	3000#	MANUAL LIGHTING
F	1	1" FULL COUPLING	3000#	PILOT GAS IN
G	1	1/2" FULL COUPLING	3000#	IGNITOR CABLE
H	1	1/2" FULL COUPLING	3000#	AUTOMATION
I	1	3" HALF COUPLING	3000#	DRIP TANK WASTE GAS IN
J	1	3" HALF COUPLING	3000#	DRIP TANK WASTE GAS OUT
K	1	1/2" FULL COUPLING	3000#	AUTOMATION
L	1	1/2" FULL COUPLING	3000#	LIQUID DRAIN

UNLESS OTHERWISE SPECIFIED

1. REMOVE ALL BURRS AND SHARP CORNERS.
2. COR. RAD .03
3. DO NOT SCALE DRAWING.
4. ALL DIMENSIONS ARE IN INCHES.
5. MACHINE FIN.
6. FABRICATION
   .X = ± 0.25
   .XX = ± 0.125
   .XXX = ± 0.06
   ANGLES ± 3°
7. MACHINE
   .X = ±0.030
   .XX = ±0.015
   .XXX = ±0.005
   ANGLES ±1/2°
   CONTRICITY WITHIN 0.010 TIR

APPROVED FOR A.S.M.E CODE, SECTION VIII DIV 1
_____ED,_____ ADDENDA BY_____ DATE_____

CIMARRON
Energy Inc.

TITLE:
48" HIGH VOLUME ECD

DATE:	WO No.:	SHEET: 1 OF 1

DRAWN BY: TDS | REV. | DRAW NO.: 3500500

Attachment T
Emissions Calculations

Table 1

Facility Information
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Oil and Gas Site General Information

Administrative Information	
Company Name	Antero Resources Corporation
Facility/Well Name	Oxford 13 Well Pad
Nearest City/Town	New Milton
API Number/SIC Code	1311
Latitude/Longitude	39.16876, -80.74779
County	Doddridge County

Technical Information	
Max Condensate Site Throughput (bbl/day):	630
Max Produced Water Site Throughput (bbl/day):	4,000
Are there any sour gas streams at this site?	No
Is this site currently operational/producing?	No

Equipment/Processes at Site	
Equipment/Process Types	**How many for this site?**
Fugitives	7
IC Engines	2
Gas Production Unit Heaters	7
Line Heaters	7
Condensate Tanks	4
Produced Water Tanks	2
Loading Jobs	2
Enclosed Combustors	2

Table 2

Uncontrolled/Controlled Emissions Summary
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Emission Source	VOC		NO_x		CH_4		CO_{2e}		CO		SO_2		$PM_{2.5}$		PM_{10}		Lead		Total HAPs		Benzene		Xylenes		Formaldehyde	
	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)	(lbs/hr)	(ton/yr)
UNCONTROLLED (Fugitives, Storage Tanks, Engines, Gas Production Unit Heaters, Line Heaters)																										
Fugitive Emissions (Component Count, PCV and Hauling)[1]	2.4447	10.7079			2.8915	12.6648	72.289	316.63							6.2468	13.0873			0.1916	0.8391	0.0019	0.0085	0.0452	0.1981		
Flashing, Working and Breathing (F/W/B) Losses[2]	74.5409	326.4892			23.9184	104.7625	598.8664	2623.0350											8.6007	37.6712	0.0246	0.1076	0.1427	0.6249		
VRU Engine Emissions[3]	0.0366	0.1604	0.1250	0.5477	0.2846	1.2466	143.2297	627.3461	0.8253	3.6146	0.0007	0.0032	0.0118	0.0515	0.0118	0.0515			0.0284	0.1244	0.0020	0.0086	0.0002	0.0011	0.0254	0.1111
Gas Production Unit Heater Emissions[4]	0.0489	0.2144	0.8900	3.8980	0.0478	0.2092	1,067.95	4,677.62	0.7476	3.2743	0.0053	0.0234	0.0676	0.2962	0.0676	0.2962	4.45E-06	1.95E-05	0.017	0.073	1.87E-05	8.19E-05			0.0007	0.0029
Line Heater Emissions[4]	0.0653	0.2859	1.1866	5.1974			1,423.93	6,236.83	0.9968	4.3658	0.0071	0.0312	0.0902	0.3950	0.0902	0.3950	5.93E-06	2.60E-05	0.022	0.098	2.49E-05	1.09E-04			0.0009	0.0039
TOTALS:	**77.1365**	**337.8577**	**2.2016**	**9.6430**	**27.1423**	**118.8831**	**3306.2698**	**14481.4619**	**2.5696**	**11.2547**	**0.0132**	**0.0578**	**0.1696**	**0.7427**	**6.4164**	**13.8301**	**1.04E-05**	**4.55E-05**	**8.8598**	**38.8059**	**0.0285**	**0.1249**	**0.1881**	**0.8241**	**0.0269**	**0.1179**
UNCONTROLLED (Truck Loading Emissions)																										
Truck Loading Emissions[5]	15.7097	7.5278			0.6634	0.4177	16.6915	10.6058											1.6227	0.7774	0.0026	1.26E-03	0.0176	0.0084		
CONTROLLED EMISSIONS																										
Enclosed Combustor Emissions (from F/W/B losses)[6]	1.4910	6.5306	1.6354	7.1631	0.4780	2.0935	399.0927	1748.0261	7.4429	32.5997	2.04E-05	0.0001	0.0091	0.0400	0.0122	0.0534	8.02E-07	3.51E-06	0.1721	0.7537	0.0005	0.0022	0.0029	0.0125	2.55E-06	1.12E-05
Controlled Fugitive Emissions from Hauling															3.1234	6.5437										
TOTALS:	**1.491**	**6.531**	**1.635**	**7.163**	**0.478**	**2.093**	**399.093**	**1748.026**	**7.443**	**32.600**	**2.04E-05**	**8.94E-05**	**0.009**	**0.040**	**3.136**	**6.597**	**8.02E-07**	**3.51E-06**	**0.172**	**0.754**	**4.92E-04**	**0.0022**	**0.0029**	**0.012**	**2.55E-06**	**1.12E-05**
POTENTIAL TO EMIT[7]	**19.7962**	**25.4269**	**3.8370**	**16.8061**	**4.3652**	**16.6317**	**3123.1877**	**13617.0588**	**10.0124**	**43.8545**	**0.0132**	**0.0578**	**0.1787**	**0.7828**	**3.3052**	**7.3398**	**1.12E-05**	**4.90E-05**	**2.0538**	**2.6658**	**0.0070**	**0.0206**	**0.0659**	**0.2201**	**0.0269**	**0.1179**
POTENTIAL TO EMIT (Excluding Fugitives)	**17.3515**	**14.7190**	**3.8370**	**16.8061**	**1.4737**	**3.9669**	**3050.8984**	**13300.4318**	**10.0124**	**43.8545**	**0.0132**	**0.0578**	**0.1787**	**0.7828**	**0.1818**	**0.7961**	**1.12E-05**	**4.90E-05**	**1.8622**	**1.8267**	**0.0051**	**0.0122**	**0.0207**	**0.0220**	**0.0269**	**0.1179**

Enter any notes here:	1 - See Tables 4 and 5 for fugitive emission calculations; Table 12 for PM emissions from hauling. 2 - See Tables 6 and 7 for tanks emission calculations 3 - See Table 13 for engine emissions 4 - See Table 9 for gas production unit heater and line heater emission calculations 5 - The maximum emission was calculated based on tank truck capacity of 200 barrels and actual fill rate of 50 minutes per tank truck. At a production rate of 630 barrels per day, VOC emissions would be 15.7097 pounds per hour when there are truck loading activities. Average hourly VOC emissions from truck loading is 1.7187 pound per hour. 6 - See Table 10 and 11 for enclosed combustion emission calculations. 7 - The maximum hourly potential to emit is the sum of emissions from gas production unit heaters, line heaters, storage tanks, engines, enclosed combustors, loading, and fugitives. PM 10 TPY is the sum of uncontrolled hauling and other PM10 sources.

Table 3

Permits Summary

Oxford 13 Well Pad

Doddridge County, West Virginia

Antero Resources Corporation

Pollutant		Emissions		Threshold Exceeded?		
		Uncontrolled	Controlled	Threshold	Uncontrolled	Controlled
VOC	lbs/hr	92.8461	19.7962	6	**Yes**	**Yes**
	tons/yr	345.3855	25.4269	10	**Yes**	**Yes**
NO_X	lbs/hr	2.2016	3.8370	6		
	tons/yr	9.6430	16.8061	10		**Yes**
CH_4	lbs/hr	27.8056	4.3652			**Yes**
	tons/yr	119.3007	16.6317			**Yes**
CO	lbs/hr	2.5696	10.0124	6		**Yes**
	tons/yr	11.2547	43.8545	10	**Yes**	**Yes**
SO_2	lbs/hr	0.0132	0.0132	6		
	tons/yr	0.0578	0.0578	10		
$PM_{2.5}$	lbs/hr	0.1696	0.1787	6		
	tons/yr	0.7427	0.7828	10		
PM_{10}	lbs/hr	6.4164	3.3052	6	**Yes**	
	tons/yr	13.8301	7.3398	10	**Yes**	
Lead	lbs/hr	1.04E-05	1.12E-05	6		
	tons/yr	4.55E-05	4.90E-05	10		
Total HAPs	lbs/hr	10.4825	2.0538	2	**Yes**	**Yes**
	tons/yr	39.5833	2.6658	5	**Yes**	
Total TAPs	lbs/hr	0.0580	0.0340	1.14		
n-Hexane	lbs/hr	9.9941	1.8982			
	tons/yr	37.6000	2.1402			
Toluene	lbs/hr	0.1351	0.0289			
	tons/yr	0.5449	0.0796			
Ethylbenzene	lbs/hr	0.0893	0.0266			
	tons/yr	0.3611	0.0867			
Xylenes	lbs/hr	0.2058	0.0659			
	tons/yr	0.8325	0.2201			
Benzene	lbs/hr	0.0311	0.0070			
	tons/yr	0.1261	0.0206			

Enter any notes here:	1. Emissions are based on 98% Enclosed Combustor DRE operating 100% of the time. 2. Please see Attachment J - Fugitive Emissions Data Summary Sheet and Attachment T - Emission Points Summary Sheet for sitewide sources and breakdown of emission quantities.

Table 4

Fugitive Emissions
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

VOC Type:	Condensate VOC
Emission Type:	Steady State (continuous)

Gas Weight Fraction From Analysis:	VOC frac	0.119
	Benzene frac	0.000
	Toluene	0.000
	Ethylbenzene	0.000
	Xylenes	0.000
	n-Hexane	0.013
	HAPs	0.013
	Methane	0.699

Gas					
Number	Component	Pollutant	Emission Factor (kg/hr of THC per component)	kg/hr	lb/yr
350	Valves	Gas VOC	0.004500	0.19	3,614.89
		Non VOC	0.004500	1.39	26,738.51
		HAPs	0.004500	0.02	403.71
		CO2e	0.004500	27.53	530,566.94
413	Connectors	VOC	0.000200	0.01	189.58
		Non-VOC	0.000200	0.07	1,402.29
		HAPs	0.000200	0.00	21.17
		CO2e	0.000200	1.44	27,825.29
91	Flanges	VOC	0.000390	0.00	81.46
		Non-VOC	0.000390	0.03	602.51
		HAPs	0.000390	0.00	9.10
		CO2e	0.000390	0.620353	11955.441740
			Total VOCs:	0.20	3885.93
			Total THC:	1.69	32629.23
			Total CH4:	1.18	22813.91

Light Liquid Weight Fraction From Analysis:	VOC frac	0.976
	Benzene frac	0.001
	Toluene	0.007
	Ethylbenzene	0.009
	Xylenes	0.023
	n-hexane	0.029
	HAPs	0.068
	Methane	0.008

Light Liquid					
Number	Component	Pollutant	Emission Factor (kg/hr of THC per component)	kg/hr	lb/yr
364	Valves	Light Liquid VOC	0.002500	0.89	17,124.97
		Light Liquid Non-VOC	0.002500	0.02	412.55
		Light Liquid HAPs	0.002500	0.06	1,199.06
		CO2e	0.002500	0.18	3471.44
			Total VOC:	0.89	17,124.97
			Total THC:	0.91	17,537.52
			Total CH4:	0.01	138.86

Fugitive Total Emissions			
	Annual Emissions (lb/yr)	Annual Emissions (lb/hr)	Annual Emissions (tpy)
VOC	21,010.90	2.40	10.51
Ethylbenzene		0.02	0.08
Toluene		0.01	0.06
Xylenes		0.05	0.20
n-Hexane		0.11	0.47
TAPs (Benzene)		0.00	0.01
HAPs		0.19	0.82
CH_4 [3]		2.62	11.48
CO_{2e}	573,819.11	65.50	286.91

Enter Notes Here:	Fugitive emissions based on an estimated component count Global Warming Potentials from EPA site Reference to Emission factors used: 1. Emission factors are for oil and gas production facilities (not refineries) come from the EPA's "Protocol for Equipment Leak Emission Estimates" November 1995, EPA 4531, R-95-017, Table 2-4. 2. Percent of speciated VOCs used in fugitive calculations are based on the total hydrocarbons, not of the total sample. 3. CH_4 emissions are based on percent of CH4 of the total hydrocarbons

Table 5

Pneumatic Control Valve Emissions
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Number of PCVs	28
Bleed Rate (scf/day/PCV)	6.6
Total Bleed Rate (scf/day)	184.8

Component	Mol%	Molecular Weight (lb/lb-mole)	Component Flow (scf/day)	Component Moles (lb-moles)	Component Emissions (lbs/day)	(lbs/hr)	(tons/year)
H2S	0.00E+00	34.08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.5	14.01	0.924	2.43E-03	0.03	1.42E-03	0.01
Carbon Dioxide	0.1712	44.01	0.3163776	8.34E-04	0.04	1.53E-03	6.70E-03
Methane	83.3669	16.04	154.0620312	0.41	6.51	0.27	1.19
Ethane	11.5578	30.07	21.3588144	0.06	1.69	0.07	0.31
Propane	2.8893	44.1	5.3394264	0.01	0.62	0.03	0.11
Isobutane	0.3499	58.12	0.6466152	1.70E-03	0.10	0.00	0.02
n-Butane	0.5817	58.12	1.0749816	2.83E-03	0.16	0.01	0.03
Isopentane	0.1584	72.15	0.2927232	7.71E-04	0.06	2.32E-03	0.01
n-Pentane	0.1296	72.15	0.2395008	6.31E-04	0.05	1.90E-03	0.01
2-Methylpentane	0.00E+00	86.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	0.00E+00	86.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane	0.2952	86.18	0.5455296	1.44E-03	0.12	0.01	0.02
Methylcyclopentane	0.00E+00	84.16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	0.00E+00	78.11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Methylhexane	0.00E+00	100.2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3-Methylhexane	0.00E+00	100.2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heptane	0.00E+00	100.21	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylcyclohexane	0.00E+00	98.186	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	92.14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Octane	0.00E+00	114.23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	106.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
m & p-Xylene	0.00E+00	106.16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	0.00E+00	106.16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nonane	0.00E+00	128.2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C10+	0.00E+00	174.28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	lb/hr	tpy
VOC Emissions	0.0462	0.2024
Benzene Emissions	0.00E+00	0.00E+00
Toluene Emissions	0.00E+00	0.00E+00
Ethylbenzene Emissions	0.00E+00	0.00E+00
Xylene Emissions	0.00E+00	0.00E+00
n-Hexane Emissions	0.0052	0.0226
HAPs Emissions	0.0052	0.0226
TAPs Emissions	0.00E+00	0.00E+00
CH_4 Emissions	0.2713	1.1884
CO_{2e} emissions	6.7848	29.7175

Enter any notes here:	1. PCV bleed rate obtained from the user manual for PCV http://issuu.com/rmcprocesscontrols/docs/mizer-pilot-operation--parts---installation-manual 2. Emissions per hour= Mol % x no. of PCV x bleed rate x MW / 379.48 / 24

Table 6

Uncontrolled Flashing Emissions
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

# Hours Operational	8760

	Condensate Tank Flashing Losses			Produced Water Tank Flashing Losses		
	Vapor Mass Fraction	Flashing Losses		Vapor Mass Fraction	Flashing Losses	
	wt%	lbs/hr	tpy	wt%	lbs/hr	tpy
Water	0.3540	0.4095	1.7937	2.7643	0.5340	2.3388
H2S	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nitrogen	0.0143	0.0165	0.0725	0.3435	0.0664	0.2907
Carbon Dioxide	0.2738	0.3168	1.3876	2.9371	0.5673	2.4849
Methane	10.0888	11.6713	51.1204	62.5644	12.0852	52.9330
Ethane	29.7028	34.3620	150.5055	22.5072	4.3476	19.0424
Propane	26.5264	30.6874	134.4108	5.7437	1.1095	4.8595
Isobutane	5.6034	6.4823	28.3926	0.6532	0.1262	0.5526
n-Butane	9.9815	11.5473	50.5770	1.3496	0.2607	1.1419
2,2 Dimethylpropane	0.0166	0.0192	0.0841	0.0011	0.0002	0.0009
Isopentane	3.7350	4.3209	18.9254	0.3334	0.0644	0.2821
n-Pentane	3.2029	3.7053	16.2291	0.1100	0.0213	0.0931
2,2 Dimethylbutane	0.0340	0.0394	0.1724	0.0011	0.0002	0.0009
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,3 Dimethylbutane	0.0531	0.0614	0.2689	0.0038	0.0007	0.0032
2-Methylpentane	0.3398	0.3930	1.7216	0.0157	0.0030	0.0133
3-Methylpentane	0.2275	0.2632	1.1528	0.0251	0.0049	0.0213
n-Hexane	6.7745	7.8372	34.3268	0.1528	0.0295	0.1293
Methylcyclopentane	0.1043	0.1207	0.5286	0.0185	0.0036	0.0157
Benzene	0.0164	0.0190	0.0833	0.0254	0.0049	0.0215
Cyclohexane	0.0954	0.1104	0.4835	0.0349	0.0067	0.0295
2-Methylhexane	0.3494	0.4043	1.7706	0.0114	0.0022	0.0097
3-Methylhexane	0.2838	0.3283	1.4378	0.0111	0.0021	0.0094
2,2,4 Trimethylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heptane	0.5797	0.6706	2.9373	0.0096	0.0019	0.0082
Methylcyclohexane	0.3848	0.4452	1.9498	0.0669	0.0129	0.0566
Toluene	0.0733	0.0848	0.3715	0.1065	0.0206	0.0901
Octane	0.8052	0.9315	4.0798	0.0055	0.0011	0.0046
Ethylbenzene	0.0433	0.0501	0.2195	0.0617	0.0119	0.0522
m & p-Xylene	0.0404	0.0468	0.2049	0.0525	0.0101	0.0444
o-Xylene	0.0564	0.0653	0.2860	0.0832	0.0161	0.0704
Nonane	0.2175	0.2516	1.1020	0.0016	0.0003	0.0013
C10+	0.0216	0.0250	0.1094	0.0049	0.0010	0.0042
Total VOCs	59.566	68.91	301.8	8.883	1.7160	7.5159
Total CO_{2e}		292.10	1,279.4		302.70	1,325.8
CH_4		11.67	51.12		12.09	52.93
Total TAPs (Benzene)		0.0190	0.0833		0.0049	0.0215
Toluene		0.0848	0.3715		0.0206	0.0901
Ethylbenzene		0.0501	0.2195		0.0119	0.0522
Xylenes		0.1121	0.4909		0.0262	0.1148
n-Hexane		7.837	34.327		0.0295	0.1293
Total HAPs		8.103	35.492		0.0931	0.4079
Total	100.00	115.69	506.7	100.00	19.316	84.61

Enter any notes here:	Vapor mass fractions and Flashing losses from Promax output

Table 7

Uncontrolled Working and Breathing Losses
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Condensate Tank Information	
Number of Tanks	4
Maximum Working Losses (lbs/hr)	4.1376
Maximum Breathing Losses (lbs/hr)	2.4462
# Hours Operational	8760

	Condensate Tank W/B Losses						
	Vapor Mass Fraction	Working Losses		Breathing Losses		Max W/B Losses	
	wt%	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
H2S	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.0007	2.73E-05	1.19E-04	0.0000	0.0001	0.0000	0.0002
Carbon Dioxide	0.2387	0.0099	0.0433	0.0058	0.0256	0.0157	0.0688
Methane	2.3635	0.0978	0.4283	0.0578	0.2532	0.1556	0.6816
Ethane	37.9345	1.5696	6.8747	0.9280	4.0645	2.4975	10.9392
Propane	28.6899	1.1871	5.1994	0.7018	3.0740	1.8889	8.2733
Isobutane	5.6335	0.2331	1.0209	0.1378	0.6036	0.3709	1.6245
n-Butane	10.0175	0.4145	1.8154	0.2451	1.0733	0.6595	2.8888
2,2 Dimethylpropane	0.0151	0.0006	0.0027	0.0004	0.0016	0.0010	0.0044
Isopentane	3.4046	0.1409	0.6170	0.0833	0.3648	0.2241	0.9818
n-Pentane	2.8743	0.1189	0.5209	0.0703	0.3080	0.1892	0.8289
2,2 Dimethylbutane	0.0301	0.0012	0.0054	0.0007	0.0032	0.0020	0.0087
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,3 Dimethylbutane	0.0462	0.0019	0.0084	0.0011	0.0049	0.0030	0.0133
2-Methylpentane	0.2933	0.0121	0.0531	0.0072	0.0314	0.0193	0.0846
3-Methylpentane	0.1962	0.0081	0.0356	0.0048	0.0210	0.0129	0.0566
n-Hexane	5.9910	0.2479	1.0857	0.1466	0.6419	0.3944	1.7276
Methylcyclopentane	0.0826	0.0034	0.0150	0.0020	0.0088	0.0054	0.0238
Benzene	0.0098	0.0004	0.0018	0.0002	0.0011	0.0006	0.0028
Cyclohexane	0.0758	0.0031	0.0137	0.0019	0.0081	0.0050	0.0219
2-Methylhexane	0.0826	0.0034	0.0150	0.0020	0.0089	0.0054	0.0238
3-Methylhexane	0.2453	0.0101	0.0445	0.0060	0.0263	0.0161	0.0707
2,2,4 Trimethylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heptane	0.4798	0.0199	0.0870	0.0117	0.0514	0.0316	0.1384
Methylcyclohexane	0.3232	0.0134	0.0586	0.0079	0.0346	0.0213	0.0932
Toluene	0.0457	1.89E-03	8.27E-03	0.0011	0.0049	0.0030	0.0132
Octane	0.6493	0.0269	0.1177	0.0159	0.0696	0.0428	0.1872
Ethylbenzene	0.0290	1.20E-03	5.26E-03	0.0007	0.0031	0.0019	0.0084
m & p-Xylene	0.0352	1.46E-03	6.38E-03	0.0009	0.0038	0.0023	0.0102
o-Xylene	0.0315	1.30E-03	0.0057	0.0008	0.0034	0.0021	0.0091
Nonane	0.1695	0.0070	0.0307	0.0041	0.0182	0.0112	0.0489
C10+	0.0114	4.70E-04	0.0021	0.0003	0.0012	0.0007	0.0033
Total VOCs	59.462	2.4603	10.776	1.4546	6.3711	3.9149	17.147
Total CO_{2e}		2.4547	10.7516	1.4513	6.3566	3.9060	17.108
CH_4		0.0978	0.4283	0.0578	0.2532	0.1556	0.6816
Total TAPs (Benzene)		4.06E-04	1.78E-03	0.0002	0.0011	0.0006	0.0028
Toluene		1.89E-03	8.27E-03	0.0011	0.0049	0.0030	0.0132
Ethylbenzene		1.20E-03	5.26E-03	0.0007	0.0031	0.0019	0.0084
Xylenes		2.76E-03	0.0121	0.0016	0.0071	0.0044	0.0192
n-Hexane		0.2479	1.0857	0.1466	0.6419	0.3944	1.7276
Total HAPs		0.2541	1.1131	0.1503	0.6581	0.4044	1.7712
Total	100.00	4.1376	18.1226	2.4462	10.7144	6.5838	28.837

Table 7

Uncontrolled Working and Breathing Losses
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Produced Water Tank Information	
Number of Tanks	2
Maximum Working Losses (lbs/hr)	0.1827
Maximum Breathing Losses (lbs/hr)	0.0083

	Produced Water Tank W/B Losses						
	Vapor Mass Fraction	Working Losses		Breathing Losses		Max W/B Losses	
	wt%	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
Water	91.5135	0.1672	0.7325	0.0076	0.0333	0.1748	0.7658
H2S	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.0065	1.19E-05	5.20E-05	5.41E-07	2.37E-06	1.24E-05	5.44E-05
Carbon Dioxide	3.7289	0.0068	0.0298	0.0003	0.0014	0.0071	0.0312
Methane	3.2925	0.0060	0.0264	0.0003	0.0012	0.0063	0.0276
Ethane	1.3974	0.0026	0.0112	0.0001	0.0005	0.0027	0.0117
Propane	0.0556	1.02E-04	0.0004	4.62E-06	2.02E-05	1.06E-04	0.0005
Isobutane	0.0016	2.89E-06	1.27E-05	1.32E-07	5.77E-07	3.02E-06	1.32E-05
n-Butane	0.0029	5.38E-06	2.36E-05	2.45E-07	1.07E-06	5.63E-06	2.46E-05
2,2 Dimethylpropane	0.0000	1.44E-09	6.31E-09	6.56E-11	2.87E-10	1.51E-09	6.60E-09
Isopentane	0.0002	3.44E-07	1.51E-06	1.57E-08	6.86E-08	3.59E-07	1.57E-06
n-Pentane	0.0000	3.34E-08	1.46E-07	1.52E-09	6.67E-09	3.49E-08	1.53E-07
2,2 Dimethylbutane	0.0000	1.84E-10	8.08E-10	8.40E-12	3.68E-11	1.93E-10	8.44E-10
Cyclopentane	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,3 Dimethylbutane	0.0000	1.05E-09	4.61E-09	4.79E-11	2.10E-10	1.10E-09	4.82E-09
2-Methylpentane	1.43E-06	2.62E-09	1.15E-08	1.19E-10	5.22E-10	2.74E-09	1.20E-08
3-Methylpentane	5.09E-06	9.31E-09	4.08E-08	4.24E-10	1.86E-09	9.73E-09	4.26E-08
n-Hexane	4.91E-06	8.97E-09	3.93E-08	4.08E-10	1.79E-09	9.38E-09	4.11E-08
Methylcyclopentane	4.49E-06	8.21E-09	3.60E-08	3.74E-10	1.64E-09	8.58E-09	3.76E-08
Benzene	3.66E-04	6.68E-07	2.93E-06	3.04E-08	1.33E-07	6.98E-07	3.06E-06
Cyclohexane	1.38E-05	2.52E-08	1.10E-07	1.15E-09	5.03E-09	2.64E-08	1.15E-07
2-Methylhexane	6.04E-08	1.10E-10	4.84E-10	5.03E-12	2.20E-11	1.15E-10	5.06E-10
3-Methylhexane	2.31E-07	4.23E-10	1.85E-09	1.93E-11	8.43E-11	4.42E-10	1.94E-09
2,2,4 Trimethylpentane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heptane	6.57E-08	1.20E-10	5.26E-10	5.46E-12	2.39E-11	1.25E-10	5.50E-10
Methylcyclohexane	5.19E-06	9.49E-09	4.16E-08	4.32E-10	1.89E-09	9.93E-09	4.35E-08
Toluene	3.32E-04	6.07E-07	2.66E-06	2.76E-08	1.21E-07	6.34E-07	2.78E-06
Octane	4.69E-09	8.57E-12	3.75E-11	3.90E-13	1.71E-12	8.96E-12	3.93E-11
Ethylbenzene	5.76E-05	1.05E-07	4.61E-07	4.79E-09	2.10E-08	1.10E-07	4.82E-07
m & p-Xylene	3.76E-05	6.87E-08	3.01E-07	3.13E-09	1.37E-08	7.18E-08	3.15E-07
o-Xylene	7.60E-05	1.39E-07	6.08E-07	6.32E-09	2.77E-08	1.45E-07	6.36E-07
Nonane	4.12E-10	7.54E-13	3.30E-12	3.43E-14	1.50E-13	7.88E-13	3.45E-12
C10+	6.75E-10	1.23E-12	5.41E-12	5.62E-14	2.46E-13	1.29E-12	5.65E-12
Total VOCs	0.0612	1.12E-04	0.0005	5.09E-06	2.23E-05	1.17E-04	0.0005
Total CO_{2e}		0.1572	0.6887	0.0072	0.0314	0.1644	0.7200
CH_4		0.0060	0.0264	0.0003	0.0012	0.0063	0.0276
Total TAPs (Benzene)		6.68E-07	2.93E-06	3.04E-08	1.33E-07	6.98E-07	3.06E-06
Toluene		6.07E-07	2.66E-06	2.76E-08	1.21E-07	6.34E-07	2.78E-06
Ethylbenzene		1.05E-07	4.61E-07	4.79E-09	2.10E-08	1.10E-07	4.82E-07
Xylenes		2.08E-07	9.09E-07	9.45E-09	4.14E-08	2.17E-07	9.51E-07
n-Hexane		8.97E-09	3.93E-08	4.08E-10	1.79E-09	9.38E-09	4.11E-08
Total HAPs		1.60E-06	6.99E-06	7.27E-08	3.18E-07	1.67E-06	7.31E-06
Total	100.00	0.1827	0.8004	0.0083	0.0364	0.1911	0.8368

Enter any notes here:	Vapor mass fractions, working losses and breathing losses from Promax output

Table 8

Loading Emissions
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Annual Loading	Oil Truck Loading	Water Truck Loading
RVP	6.09	1.0333
Annual Average Temp (F)	72.1	72.1
S (saturation factor)	0.6	0.6
P (true vapor pressure)	4.70	0.45
M (MW of vapor)	39.69	18.46
Collection Efficiency (%)	0.00	0.00
Total Hydrocarbon Loading Loss (lb/10^3 gal)*	2.62	0.12
Maximum Throughput (gallons/hr)**	10,080	10,080
Average Throughput (gallons/yr)	9,657,900	61,320,000
Total Hydrocarbon Loading Emissions (lbs/hr)	26.42	1.18
Total Hydrocarbon Loading Emissions (tpy)	12.66	3.60

	Condensate Tank Loading Losses			Produced Water Tank Loading Losses		
	Vapor Mass Fraction	Loading Losses		Vapor Mass Fraction	Loading Losses	
	wt%	lbs/hr	tpy	wt%	lbs/hr	tpy
H2S	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen	0.0007	1.74E-04	8.35E-05	0.0065	7.69E-05	2.34E-04
Carbon Dioxide	0.2387	0.0631	3.02E-02	3.7289	4.41E-02	1.34E-01
Methane	2.3635	0.6244	2.99E-01	3.2925	3.90E-02	1.19E-01
Ethane	37.9345	10.0217	4.8010	1.3974	1.65E-02	5.03E-02
Propane	28.6899	7.5794	3.63E+00	0.0556	6.58E-04	2.00E-03
Isobutane	5.6335	1.4883	7.13E-01	0.0016	1.87E-05	5.70E-05
n-Butane	10.0175	2.6465	1.27E+00	0.0029	3.49E-05	1.06E-04
2,2 Dimethylpropane	0.0151	0.0040	1.92E-03	0.0000	9.33E-09	2.84E-08
Isopentane	3.4046	0.8994	4.31E-01	0.0002	2.23E-06	6.77E-06
n-Pentane	2.8743	0.7593	3.64E-01	0.0000	2.16E-07	6.58E-07
2,2 Dimethylbutane	0.0301	0.0079	3.80E-03	0.0000	1.19E-09	3.63E-09
Cyclopentane	0.0000	0.0000	0.00E+00	0.0000	0.00E+00	0.00E+00
2,3 Dimethylbutane	0.0462	0.0122	5.84E-03	0.0000	6.81E-09	2.07E-08
2-Methylpentane	0.2933	0.0775	3.71E-02	1.43E-06	1.69E-08	5.15E-08
3-Methylpentane	0.1962	0.0518	2.48E-02	5.09E-06	6.03E-08	1.83E-07
n-Hexane	5.9910	1.5827	7.58E-01	4.91E-06	5.81E-08	1.77E-07
Methylcyclopentane	0.0826	0.0218	1.05E-02	4.49E-06	5.32E-08	1.62E-07
Benzene	0.0098	0.0026	1.24E-03	0.0004	4.33E-06	1.32E-05
Cyclohexane	0.0758	0.0200	9.59E-03	0.0000	1.63E-07	4.97E-07
2-Methylhexane	0.0826	0.0218	1.05E-02	0.0000	7.15E-10	2.18E-09
3-Methylhexane	0.2453	0.0648	3.10E-02	0.0000	2.74E-09	8.33E-09
2,2,4 Trimethylpentane	0.0000	0.0000	0.00E+00	0.0000	0.00E+00	0.00E+00
Heptane	0.4798	0.1268	6.07E-02	6.57E-08	7.77E-10	2.36E-09
Methylcyclohexane	0.3232	0.0854	4.09E-02	5.19E-06	6.15E-08	1.87E-07
Toluene	0.0457	0.0121	5.78E-03	0.0003	3.93E-06	1.19E-05
Octane	0.6493	0.1715	8.22E-02	4.69E-09	5.55E-11	1.69E-10
Ethylbenzene	0.0290	0.0077	3.68E-03	5.76E-05	6.81E-07	2.07E-06
m & p-Xylene	0.0352	0.0093	4.45E-03	3.76E-05	4.45E-07	1.35E-06
o-Xylene	0.0315	0.0083	3.98E-03	7.60E-05	8.99E-07	2.74E-06
Nonane	0.1695	0.0448	2.15E-02	4.12E-10	4.88E-12	1.48E-11
C10+	0.0114	0.0030	1.44E-03	6.75E-10	7.99E-12	2.43E-11
Total VOCs	59.4623	15.7089	7.5256	0.0612	7.24E-04	2.20E-03
Total CH_4		0.6244	0.2991		0.0390	0.1185
Total CO_{2e}		15.6732	7.5085		1.0183	3.0974
Total TAPs (Benzene)		0.0026	1.24E-03		4.33E-06	1.32E-05
Toluene		0.0121	5.78E-03		3.93E-06	1.19E-05
Ethylbenzene		0.0077	3.68E-03		6.81E-07	2.07E-06
Xylenes		0.0176	8.44E-03		1.34E-06	4.09E-06
n-Hexane		1.5827	7.58E-01		5.81E-08	1.77E-07
Total HAPs		1.6227	7.77E-01		1.03E-05	3.14E-05
Total	100.0000	26.4183	12.6560	100.0000	1.1835	3.5999

Enter any notes here

Vapor mass fractions and loading losses from Promax output

Using equation L_L = 12.46 SPM/T from AP-42, Chapter 5, Section 5.2-4

MW was obtained by Promax; RVP was taken from laboratory reports

Annual Average Temp (F) obtained from Charleston, WV (preset in Promax)

S (saturation factor) is based on submerged loading, dedicated service as it was most representative

True vapor pressure (TVP) equation from AP-42, Chapter 7, Figure 7.1-13a

** Maximum throughput in gallons per hour obtained from actual transfer rate of 200 barrels in 50 minutes. (10,080 gal/hr = 200 bbl / 50 min x 42 gal/bbl x 60 min/hr)

Loading emissions are vented to the atmosphere.

Table 9

Gas Production Unit Heater and Line Heater Emissions
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Gas Production Unit Heater Emissions

Number of Units	7
GPU Heater Rating (MMBtu/hr)	1.50
Operating hours/year	8760
Fuel Heat Value (Btu/scf)	1,179.83

Pollutant	Emission Factors (lb/MMscf)	lb/hr	tpy
NOx	100	0.890	3.898
CO	84	0.748	3.274
CO_2	120,000	1067.950	4677.623
Lead	0.0005	4.45E-06	1.95E-05
N_2O	2.2	0.020	0.086
PM (Total)	7.6	0.068	0.296
SO_2	0.6	0.005	0.023
TOC	11	0.098	0.429
Methane	2.3	0.020	0.090
VOC	5.5	0.049	0.214
HAPS			
2-Methylnaphthalene	2.40E-05	2.14E-07	9.36E-07
Benzene	2.10E-03	1.87E-05	8.19E-05
Dichlorobenzene	1.20E-03	1.07E-05	4.68E-05
Fluoranthene	3.00E-06	2.67E-08	1.17E-07
Fluorene	2.80E-06	2.49E-08	1.09E-07
Formaldehyde	7.50E-02	6.67E-04	2.92E-03
Hexane	1.80E+00	1.60E-02	7.02E-02
Naphthalene	6.10E-04	5.43E-06	2.38E-05
Phenanathrene	1.70E-05	1.51E-07	6.63E-07
Toluene	3.40E-03	3.03E-05	1.33E-04

Line Heater Emissions

Number of Units	7
Line Heater Rating (MMBtu/hr)	2.00
Operating hours/year	8760
Fuel Heat Value (Btu/scf)	1,179.83

Pollutant	Emission Factors (lb/MMscf)	lb/hr	tpy
NOx	100	1.187	5.197
CO	84	0.997	4.366
CO_2	120,000	1423.934	6236.831
Lead	0.0005	5.93E-06	2.60E-05
N_2O	2.2	0.026	0.114
PM (Total)	7.6	0.090	0.395
SO_2	0.6	0.007	0.031
TOC	11	0.131	0.572
Methane	2.3	0.027	0.120
VOC	5.5	0.065	0.286
HAPS			
2-Methylnaphthalene	2.40E-05	2.85E-07	1.25E-06
Benzene	2.10E-03	2.49E-05	1.09E-04
Dichlorobenzene	1.20E-03	1.42E-05	6.24E-05
Fluoranthene	3.00E-06	3.56E-08	1.56E-07
Fluorene	2.80E-06	3.32E-08	1.46E-07
Formaldehyde	7.50E-02	8.90E-04	3.90E-03
Hexane	1.80E+00	2.14E-02	9.36E-02
Naphthalene	6.10E-04	7.24E-06	3.17E-05
Phenanathrene	1.70E-05	2.02E-07	8.84E-07
Toluene	3.40E-03	4.03E-05	1.77E-04

	lb/hr	tpy
TOTAL Uncontrolled VOC	0.114	0.500
TOTAL Uncontrolled HAPs	0.039	0.171
TOTAL Uncontrolled TAPs (Benzene)	4.36E-05	1.91E-04
TOTAL Uncontrolled Toluene	7.06E-05	3.09E-04
TOTAL Uncontrolled Hexane	0.037	0.164
TOTAL Uncontrolled TAPs (Formaldehyde)	0.002	0.007
TOTAL CH_4	0.048	0.209
TOTAL CO_{2e} Emissions	2,506.69	10,979.31

Enter any notes here:
All Emission Factors based off AP-42 Sec 1.4 Natural Gas Combustion

Table 10

Enclosed Combustor Emissions
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

General Information	
Unit Name:	EC001, EC002

Pollutant	Emission Factor (lb/MMscf)
NOx	100
CO	84
PM10	7.6
PM2.5	5.7
SO_2	0.6
CO_2	120,000
VOC	5.5
benzene	2.10E-03
Hexane	1.80E+00
Toluene	3.40E-03
Formaldehyde	7.50E-02
N_2O	2.20
Lead	5.00E-04

Pollutant	Emission Factor[2] (lb/MMBtu)
NO_x	0.068
CO	0.31

Constants	
Btu/MMBtu	1,000,000
scf/MMscf	1,000,000
lb/ton	2,000
H_2S molecular weigl	34.08
SO_2 molecular	64.06
seconds/hour	3,600
inches/ft	12

Destruction Efficiency	
VOC percent destruction efficiency (%)	98
H_2S percent destruction efficiency (%)	98

Enclosed Combustor operating hours	8760
No. of Enclosed Combustors	2
Maximum Design Heat Input Per Enclosed Combustor (MMBtu/hr)	12

Stream Information							
	1	2	3	4	5	6	Total
Stream Sent to Enclosed/Vapor Combustor (Enter Name of Each Stream Here)	pilot(s)	added fuel stream(s)	Oil Tank Flash Emissions	Water Tank Flash Emissions	Oil Tank W/B Emissions	Water Tank W/B Emissions	-
Maximum Expected Hourly Volumetric Flow Rate of Stream (scf/hr)	34	--	1,106.05	397.14	62.95	3.93	1,604.06
Maximum Expected Annual Volumetric Flow Rate of Stream (scf/yr)	297,840.00	--	9,688,998.64	3,478,904.51	551,409.44	34,410.15	14,051,562.74
Heating Content (Btu/ft3)	1,180		2,104.07	1,140.88	2,274.24	101.25	1,822.78

Mass Flow Rates of the Vapors Sent to this Control Device, Hourly Basis (lb/hr)							
	1	2	3	4	5	6	Total
Stream Sent to Enclosed Combustor/Vapor Combustor	pilot(s)	added fuel stream(s)	Oil Tank Flash Emissions	Water Tank Flash Emissions	Oil Tank W/B Emissions	Water Tank W/B Emissions	-
H2S	-	-	0.000	0.000	0.000	0.000	0.000
Total VOC	-	-	68.910	1.716	3.915	0.000	74.54
Benzene	-	-	0.019	0.005	0.001	0.000	0.025
Toluene	-	-	0.085	0.021	0.003	0.000	0.108
Ethylbenzene	-	-	0.050	0.012	0.002	0.000	0.064
Xylenes	-	-	0.112	0.026	0.004	0.000	0.143
n-Hexane	-	-	7.837	0.030	0.394	0.000	8.261
HAPs	-	-	8.103	0.093	0.404	0.000	8.601
Total Mass Flow	-	-	115.686	19.316	6.584	0.191	141.777
Mass Flow Rates of the Vapors Sent to this Control Device, Annual Basis (tpy)							
H2S	-	-	0.000	0.000	0.000	0.000	0.000
Total VOC	-	-	301.826	7.516	17.147	0.001	326.489
Benzene	-	-	0.083	0.021	0.003	0.000	0.108
Toluene	-	-	0.372	0.090	0.013	0.000	0.475
Ethylbenzene	-	-	0.219	0.052	0.008	0.000	0.280
Xylenes	-	-	0.491	0.115	0.019	0.000	0.625
n-Hexane	-	-	34.327	0.129	1.728	0.000	36.184
HAP	-	-	35.492	0.408	1.771	0.000	37.671
Total Mass Flow	-	-	506.705	84.606	28.837	0.837	620.985

Table 10

Enclosed Combustor Emissions
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Controlled Emissions							
Hourly (lb/hr)							
	1	2	3	4	5	6	Total
Stream Sent to Enclosed Combustor/Vapor Combustor	pilot(s)	added fuel stream(s)	Oil Tank Flash Emissions	Water Tank Flash Emissions	Oil Tank W/B Emissions	Water Tank W/B Emissions	-
NOx	0.003	-	1.632				1.64
CO	0.003	-	7.440				7.44
PM2.5	0.000	-	0.006	0.002	0.000	0.000	0.01
PM10	0.000	-	0.008	0.003	0.000	0.000	0.01
H2S	0.000	-	0.000	0.000	0.000	0.000	0.00
SO_2	0.000	-	0.000	0.000	0.000	0.000	0.00
CO_2	4.080	-	-	-	-	-	4.08
Total VOC	0.000	-	1.378	0.034	0.078	0.000	1.49
Benzene	0.000	-	0.000	0.000	0.000	0.000	0.00
Toluene	0.000	-	0.002	0.000	0.000	0.000	0.00
Ethylbenzene	0.000	-	0.001	0.000	0.000	0.000	0.00
Xylenes	0.000	-	0.002	0.001	0.000	0.000	0.00
n-Hexane	0.000	-	0.157	0.001	0.008	0.000	0.17
HAP	0.000	-	0.162	0.002	0.008	0.000	0.17
N_2O	0.000	-	0.002	0.001	0.000	0.000	0.00
Lead	0.000	-	0.000	0.000	0.000	0.000	0.00
Formaldehyde	0.000	-	-	-	-	-	0.00
Annual (tpy)							
	1	2	3	4	5	6	Total
Stream Sent to Enclosed Combustor/Vapor Combustor	pilot(s)	added fuel stream(s)	Oil Tank Flash Emissions	Water Tank Flash Emissions	Oil Tank W/B Emissions	Water Tank W/B Emissions	-
NOx	0.015	-	7.148				7.16
CO	0.013	-	32.587				32.60
PM2.5	0.001	-	0.028	0.010	0.002	0.000	0.04
PM10	0.001	-	0.037	0.013	0.002	0.000	0.05
H_2S	0.000	-	0.000	0.000	0.000	0.000	0.00
SO_2	0.000	-	0.000	0.000	0.000	0.000	0.00
CO_2	17.870	-	-	-	-	-	17.87
Total VOC	0.001	-	6.037	0.150	0.343	0.000	6.53
Benzene	0.000	-	0.002	0.000	0.000	0.000	0.00
Toluene	0.000	-	0.007	0.002	0.000	0.000	0.01
Ethylbenzene	0.000	-	0.004	0.001	0.000	0.000	0.01
Xylenes	0.000	-	0.010	0.002	0.000	0.000	0.01
n-Hexane	0.000	-	0.687	0.003	0.035	0.000	0.72
HAP	0.000	-	0.710	0.008	0.035	0.000	0.75
N_2O	0.000	-	0.011	0.004	0.001	0.000	0.02
Lead	0.000	-	0.000	0.000	0.000	0.000	0.00
Formaldehyde	0.000	-	-	-	-	-	0.00

Enclosed Combustor/Vapor Combustor Total Emissions		
	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
Total VOC	1.49	6.53
NOx	1.635	7.163
CO	7.443	32.600
PM2.5	0.009	0.040
PM10	0.012	0.053
H_2S	1.09E-05	4.75E-05
SO_2	2.04E-05	8.94E-05
Benzene (TAPs)	4.92E-04	2.15E-03
Toluene	2.17E-03	9.50E-03
Ethylbenzene	1.28E-03	5.60E-03
Xylenes	2.85E-03	0.012
Hexanes	0.165	0.724
Formaldehyde (TAPs)	2.55E-06	1.12E-05
HAPs	0.17	0.75
CH_4	0.48	2.09
CO_2e	399.09	1748.03
N_2O	0.004	0.01546
Lead	8.02E-07	3.51E-06

Enter any notes here as needed
1. Emission Factors from AP-42 Tables 1.4-1, 1.4-2, and 1.4.3
2. Emission Factors from AP-42 Tables 13.5-1 and 13.5-2 for industrial flares

Table 11

Enclosed Combustor GHG Emissions
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Enclosed Combustor CO_2 and CH_4 Emissions

Components	Mole fraction of oil flash gas constituents[a]	Volume of oil flash gas sent to Enclosed Combustor *scf/year*	Mole fraction of water flash gas constituents[a]	Volume of water flash gas sent to Enclosed Combustor *scf/year*	Mole fraction of oil tank vapors constituents[a]	Volume of oil tank vapor sent to Enclosed Combustor *scf/year*	Mole fraction of water tank vapors constituents[a]	Volume of water tank vapors sent to Enclosed Combustor *scf/year*	Component volume of gas sent to Enclosed Combustor *scf/year*	Number of carbon atoms	Combustion Efficiency	Combusted CO_2 Volume[b] *scf/year*	Uncombusted CO_2 and CH_4 Volume[b] *scf/year*	Volume GHGs Emitted *scf/year*
CO_2	0.002	9,688,999	0.0132	3,478,905	0.0022	551,409	0.016	34,410	69,620	1	0	--	69,620	28,857,696
Methane	0.231	9,688,999	0.7690	3,478,905	0.0585	551,409	0.038	34,410	4,944,951	1	0.98	4,846,052	98,899	98,899
Ethane	0.362	9,688,999	0.1476	3,478,905	0.5007	551,409	0.009	34,410	4,301,322	2	0.98	8,430,592	--	
Propane	0.221	9,688,999	0.0257	3,478,905	0.2582	551,409	0.000	34,410	2,370,057	3	0.98	6,967,968	--	
i-Butane	0.035	9,688,999	0.0022	3,478,905	0.0385	551,409	0.000	34,410	371,655	4	0.98	1,456,889	--	
n-Butane	0.063	9,688,999	0.0046	3,478,905	0.0684	551,409	0.000	34,410	664,175	4	0.98	2,603,566	--	
Pentane	0.035	9,688,999	0.0012	3,478,905	0.0345	551,409	0.000	34,410	365,101	5	0.98	1,788,996	--	
Hexane	0.031	9,688,999	0.0004	3,478,905	0.0298	551,409	0.000	34,410	320,849	6	0.98	1,886,593	--	
Benzene	0.000	9,688,999	0.0001	3,478,905	0.0000	551,409	0.000	34,410	999	6	0.98	5,874	--	
Heptanes	0.005	9,688,999	0.0001	3,478,905	0.0036	551,409	0.000	34,410	49,786	7	0.98	341,533	--	
Toluene	0.000	9,688,999	0.0002	3,478,905	0.0002	551,409	0.000	34,410	3,730	7	0.98	25,589	--	
Octane	0.004	9,688,999	0.0001	3,478,905	0.0036	551,409	0.000	34,410	41,455	8	0.98	325,006	--	
Ethyl benzene	0.000	9,688,999	0.0001	3,478,905	0.0001	551,409	0.000	34,410	1,909	8	0.98	14,967	--	
Xylenes	0.000	9,688,999	0.0003	3,478,905	0.0002	551,409	0.000	34,410	4,258	8	0.98	33,386	--	
Nonane	0.001	9,688,999	0.0000	3,478,905	0.0005	551,409	0.000	34,410	6,328	9	0.98	55,817	--	
Decane plus	0.000	9,688,999	0.0000	3,478,905	0.0000	551,409	0.000	34,410	536	10	0.98	5,248	--	
Subtotal												**28,788,076**	--	

Pollutant	Volume Emitted *scf/year*	Density of GHG[c] *lb/scf*	Conversion Factor *lb/ton*	GWF	Emissions[c] *lbs/hr*	Emissions[c] *(tons/yr)*
CO_2	28,857,696	0.12	2000	1	382.01	1,673.21
CH_4	98,899	0.04	2000	25	0.48	2.09
				CO_2e Emissions	**394.0**	**1725.54**

GHG Emissions Summary

Notes

a Flashing/Working/Breathing Losses from ProMax output reports

b 40 CFR 98.233 (n)(4): Eqns: W-19, W-20 and W-21

c 40 CFR 98.233(v) Eqn W-36 - density at 60°F and 14.7 psia

Table 12

Haul Road Emissions
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

	PM	PM10
Particle Size Multiplier (k)	0.8	0.36
Silt Content of Road Surface Material (s) (%)	5.1	5.1
Days per Year with Precipitation > 0.01 in (p)	150	150
Control Efficiency for Watering [1] (%)	50	50

Tanker Truck Trip Calculation	
Condensate Production (bbl/day)	630
PW Production (bbl/day)	4,000
Truck Capacity (bbl)	200

Pick Up Truck Trip Calculation	
No of Trips Per day	2
Trips Per Year	730

	# of Wheels	Mean Vehicle Weight (W) (tons)	Mean Vehicle Speed (S) (mph)	Miles Per Trip (miles)	Maximum Trips per Hour	Maximum Trips per Year	Vehicle Miles Travelled (miles/hr)	Vehicle Miles Travelled (miles/year)	PM (lbs/VMT)	PM10 (lbs/VMT)
Tanker Trucks Condensate	10	40	10	1.8000	1	1150	1.8000	2070.0000	3.8175	1.7179
Tanker Trucks PW	10	40	10	1.8000	1	7300	1.8000	13140.0000	3.8175	1.7179
Pick Up Truck	4	3	10	0.4000	1	730	0.4000	292.0000	0.3467	0.1560

	Uncontrolled Emissions						Controlled Emissions					
	PM			PM10			PM			PM10		
	(lbs/hr)	(lbs/year)	(tpy)	(lbs/hr)	(lbs/year)	(tpy)	(lbs/hr)	(lbs/year)	(tpy)	(lbs/hr)	(lbs/year)	(tpy)
Tanker Trucks Condensate	6.8716	7902.2858	3.9511	3.0922	3556.0286	1.7780	3.4358	3951.1429	1.9756	1.5461	1778.0143	0.8890
Tanker Trucks PW	6.8716	50162.3362	25.0812	3.0922	22573.0513	11.2865	3.4358	25081.1681	12.5406	1.5461	11286.5256	5.6433
Pick Up Truck	0.1387	101.2305	0.0506	0.0624	45.5537	0.0228	0.0693	50.6152	0.0253	0.0312	22.7769	0.0114
Total Emissions	13.8818	58,165.8525	29.0829	6.2468	26,174.6336	13.0873	6.9409	29,082.9263	14.5415	3.1234	13,087.3168	6.5437

Enter any notes here:	1 EPA, AP-42, Volume I, Section 13.2.2 Unpaved Roads (11/06); assume 2:1 moisture ratio Section 13.2.2 Unpaved Roads (11/06) Source: Attachment L, Fugitive Emissions from Unpaved Haul Roads, Rev 03/2007, West Virginia Department of Environmental Protection

Table 13

Engine Emissions
Oxford 13 Well Pad
Doddridge County, West Virginia
Antero Resources Corporation

Ford MSG425 2.5L Engine

Power (hp) [1]	76
Fuel consumption (lbs/BHP-hr) [1]	0.3864
Heat Content of Fuel (Btu/scf)	1179.83
Density of NG (lb/scf)	0.056
Operating Hours/year	8760
No. of Engines	2

Pollutant	Emission Factors (g/hp-hr)	Emission Factors (lb/MMBtu)	lb/hr	tpy
NOx[2]	0.3731		0.1250	0.5477
CO[2]	2.4627		0.8253	3.6146
CO_2		110.000	136.1146	596.18
$PM_{2.5}$		9.500E-03	0.0118	0.0515
PM_{10}		9.500E-03	0.0118	0.0515
PM (Total)		9.910E-03	0.0123	0.0537
SO_2		5.880E-04	0.0007	0.0032
TOC		0.358	0.4430	1.9403
Methane		0.230	0.2846	1.2466
VOC[3]		0.0296	0.0366	0.1604
HAPS				
Benzene		0.002	1.96E-03	0.009
Ethylbenzene		2.48E-05	3.07E-05	1.34E-04
Formaldehyde		0.021	0.025	0.111
Naphthalene		9.71E-05	1.20E-04	5.26E-04
Toluene		5.58E-04	6.90E-04	3.02E-03
Xylene		1.95E-04	2.41E-04	1.06E-03

	lb/hr	tpy
TOTAL Uncontrolled VOC	0.037	0.160
TOTAL Uncontrolled NOx	0.125	0.548
TOTAL Uncontrolled HAPs	0.028	0.124
TOTAL Uncontrolled TAPs (Benzene)	1.96E-03	0.009
TOTAL Uncontrolled Toluene	6.90E-04	3.02E-03
TOTAL Uncontrolled Ethylbenzene	3.07E-05	1.34E-04
TOTAL Uncontrolled Xylenes	2.41E-04	1.06E-03
TOTAL Uncontrolled TAPs (Formaldehyde)	0.025	0.111
TOTAL CH_4 Emissions	0.285	1.247
TOTAL CO_{2e} Emissions	143.230	627.346

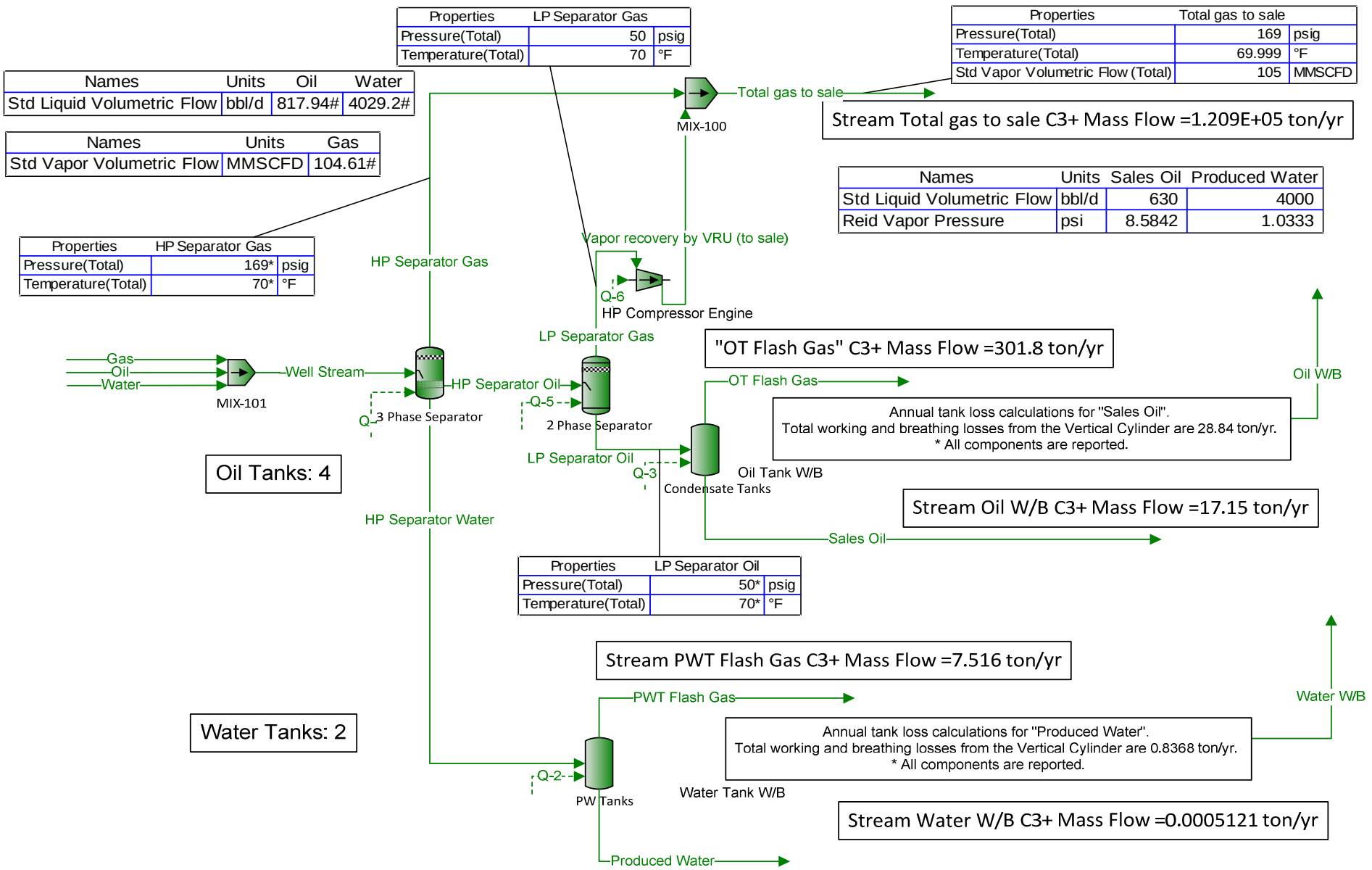
Enter Any Notes Here:

1. Engines were manufactured in 2015 for MSG-425. Engine ratings were taken from manufacturer engine specifications. Please see copies of manufacturer engine specifications in Appendix N.
2. Emission factors used for the 76 HP engine NOX and CO emissions are certification levels indicated on MSG-425 CARB document. See MSG-425 CARB document in Appendix N.
3. Emission factors for all other contaminants including VOCs were obtained from AP-42, Section 3.2 "Natural Gas-fired Reciprocating Engines", Table 3.2-3.
4. Hours of operation was calculated based on the 100% operation of the VRU.

Simulation Report	
Client Name:	Antero Resources
Location:	Doddridge County, WV
Job:	Oxford 13 Well Pad

Project Name:	Antero Promax Model- VRT
File Name:	I:\Air Quality\6-chars\08----\0827--\082715\ANTERO RESOURCES \ProMax\Antero WV_VRT\ProMax Model\Antero Promax Model-VRT.pmx
ProMax Version:	4.0.16071.0

Report Created:	9/24/2017 10:39


Properties LP Separator Gas
Pressure(Total) 50 psig
Temperature(Total) 70 °F
Properties Total gas to sale
Pressure(Total) 169 psig
Temperature(Total) 69.999 °F
Std Vapor Volumetric Flow (Total) 105 MMSCFD
Names Units Oil Water
Std Liquid Volumetric Flow bbl/d 817.94# 4029.2#
Total gas to sale
MIX-100
Stream Total gas to sale C3+ Mass Flow =1.209E+05 ton/yr
Names Units Gas
Std Vapor Volumetric Flow MMSCFD 104.61#
Names Units Sales Oil Produced Water
Std Liquid Volumetric Flow bbl/d 630 4000
Reid Vapor Pressure psi 8.5842 1.0333
Properties HP Separator Gas
Pressure(Total) 169* psig
Temperature(Total) 70* °F
Vapor recovery by VRU (to sale)
HP Separator Gas
Q-6
HP Compressor Engine
LP Separator Gas
"OT Flash Gas" C3+ Mass Flow =301.8 ton/yr
Gas
Oil
Water
MIX-101
Well Stream
HP Separator Oil
Q-5
Q-4
3 Phase Separator
2 Phase Separator
OT Flash Gas
Oil W/B
Annual tank loss calculations for "Sales Oil".
Total working and breathing losses from the Vertical Cylinder are 28.84 ton/yr.
* All components are reported.
Oil Tanks: 4
LP Separator Oil
Q-3
Oil Tank W/B
Condensate Tanks
Stream Oil W/B C3+ Mass Flow =17.15 ton/yr
HP Separator Water
Sales Oil
Properties LP Separator Oil
Pressure(Total) 50* psig
Temperature(Total) 70* °F
Stream PWT Flash Gas C3+ Mass Flow =7.516 ton/yr
PWT Flash Gas
Water W/B
Water Tanks: 2
Annual tank loss calculations for "Produced Water".
Total working and breathing losses from the Vertical Cylinder are 0.8368 ton/yr.
* All components are reported.
Q-2
PW Tanks
Water Tank W/B
Stream Water W/B C3+ Mass Flow =0.0005121 ton/yr
Produced Water

Process Streams	Gas	HP Separator Gas	HP Separator Oil	HP Separator Water	LP Separator Gas	LP Separator Oil	Oil	Oil W/B	OT Flash Gas	Produced Water	PWT Flash Gas	Sales Oil	Total gas to sale	Vapor recovery by VRU (to sale)	Water	Water W/B	Well Stream
Composition Status:	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Total** From Block:	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	2 Phase Separator	2 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	HP Compressor Engine	--	--	MIX-101
To Block:	MIX-101	MIX-100	2 Phase Separator	PW Tanks	HP Compressor Engine	Condensate Tanks	MIX-101	--	--	--	--	--	--	MIX-100	MIX-101	--	3 Phase Separator
Mole Fraction	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water	0*	0.207705	0.0819432	99.9675	0.424797	0.0622763	0*	0.000638334*	0.721079	99.9967	3.03299	0.0236428	0.207766	0.424797	100*	93.7609*	22.0060
H2S	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
Nitrogen	0.5*	0.498263	0.00957677	7.59467E-05	0.157968	0.00106467	0.0219998*	0.000934258*	0.0187363	2.83860E-06	0.242406	2.83702E-05	0.498167	0.157968	0*	0.00428097*	0.387420
Carbon Dioxide	0.1712*	0.170234	0.0284803	0.00103693	0.253058	0.0155979	0.0139999*	0.215259*	0.228350	0.000639271	1.31914	0.00312172	0.170257	0.253058	0*	1.56390*	0.132687
Methane	83.3669*	83.0658	4.86174	0.0251056	65.5401	1.38108	4.97995*	5.84776*	23.0784	0.00185697	77.0868	0.108709	83.0608	65.5401	0*	3.78816*	64.6029
Ethane	11.5578*	11.5290	4.08912	0.00499389	22.5873	3.02802	5.23595*	50.0741*	36.2506	0.000531796	14.7954	1.07979	11.5321	22.5873	0*	0.857792*	8.98066
Propane	2.8893*	2.89521	3.76359	0.000841849	7.00576	3.57762	5.28795*	25.8245*	22.0760	6.53563E-05	2.57466	2.49283	2.89638	7.00576	0*	0.0232559*	2.26628
Isobutane	0.3499*	0.354445	1.15385	7.09225E-05	0.885703	1.16923	1.72798*	3.84711*	3.53790	3.92940E-06	0.222131	1.03033	0.354596	0.885703	0*	0.000502557*	0.280254
n-Butane	0.5817*	0.593896	2.80175	0.000149111	1.49170	2.87690	4.22196*	6.84093*	6.30222	1.06870E-05	0.458981	2.67603	0.594150	1.49170	0*	0.000935280*	0.473114
2,2-Dimethylpropane	0*	0.000785246	0.00470513	9.35328E-08	0.00195255	0.00486302	0.117999*	0.00832728*	0.00843809	3.29433E-09	0.000299205	0.00465337	0.000785577	0.00195255	0*	2.01763E-07*	0.000629587
Isopentane	0.1584*	0.169680	1.91082	2.90540E-05	0.417647	1.99647	3.18197*	1.87297*	1.89976	1.50395E-06	0.0913487	2.00214	0.169751	0.417647	0*	4.81302E-05*	0.139675
n-Pentane	0.1296*	0.142740	2.15424	9.29151E-06	0.351841	2.25763	3.62196*	1.58125*	1.62910	1.98496E-07	0.0301497	2.29448	0.142799	0.351841	0*	4.67908E-06*	0.119714
2,2-Dimethylbutane	0*	0.00126396	0.0300125	7.68504E-08	0.00308791	0.0315569	0.206998*	0.0138409*	0.0144930	1.48653E-09	0.000249884	0.0325576	0.00126447	0.00308791	0*	2.16132E-08*	0.00110445
Cyclopentane	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
2,3-Dimethylbutane	0*	0.00196338	0.0629868	2.73288E-07	0.00476948	0.0663263	0.333997*	0.0212694*	0.0225949	1.16742E-08	0.000867438	0.0688908	0.00196418	0.00476948	0*	1.23262E-07*	0.00178205
2-Methylpentane	0*	0.0125647	0.447245	1.11628E-06	0.0304037	0.471156	2.17098*	0.135069*	0.144684	3.25480E-08	0.00359332	0.490301	0.0125698	0.0304037	0*	3.06633E-07*	0.0115833
3-Methylpentane	0*	0.00840471	0.333014	1.86780E-06	0.0203209	0.350951	1.47799*	0.0903593*	0.0968822	1.29187E-07	0.00576481	0.365850	0.00840809	0.0203209	0*	1.09114E-06*	0.00788585
n-Hexane	0.2952*	0.250514	12.8264	1.07278E-05	0.600054	13.5278	3.40097*	2.75938*	2.88491	1.57664E-07	0.0350474	14.1519	0.250613	0.600054	0*	1.05126E-06*	0.246809
Methylcyclopentane	0*	0.00389576	0.198920	1.47567E-06	0.00946914	0.209787	0.718993*	0.0389478*	0.0454901	1.62327E-07	0.00435478	0.219422	0.00389734	0.00946914	0*	9.85315E-07*	0.00383621
Benzene	0*	0.000655114	0.0376073	2.29772E-05	0.00160162	0.0396727	0.124999*	0.00498704*	0.00772548	2.10447E-05	0.00642856	0.0415461	0.000655382	0.00160162	0*	8.63836E-05*	0.000666936
Cyclohexane	0*	0.00359086	0.259870	3.18594E-06	0.00863854	0.274281	0.720993*	0.0357358*	0.0416110	7.13015E-07	0.00820013	0.287925	0.00359229	0.00863854	0*	3.02615E-06*	0.00384688
2-Methylhexane	0*	0.0113720	1.26217	6.92747E-07	0.0265192	1.33305	2.61697*	0.0327367*	0.127977	1.39567E-08	0.00225066	1.40372	0.0113763	0.0265192	0*	1.11299E-08*	0.0139630
3-Methylhexane	0*	0.00920891	1.13750	6.78061E-07	0.0214627	1.20152	2.20698*	0.0971649*	0.103924	1.62446E-08	0.00219439	1.26589	0.00921238	0.0214627	0*	4.26360E-08*	0.0117754
2,2,4-Trimethylpentane	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
Heptane	0*	0.0190127	3.04332	5.79931E-07	0.0438167	3.21538	5.08495*	0.190072*	0.212300	6.31174E-09	0.00190194	3.39149	0.0190197	0.0438167	0*	1.20956E-08*	0.0271309
Methylcyclohexane	0*	0.0126185	2.05002	4.56299E-06	0.0295663	2.16592	3.39797*	0.130639*	0.143824	4.99414E-07	0.0134740	2.28450	0.0126233	0.0295663	0*	9.76541E-07*	0.0181300
Toluene	0*	0.00253839	0.510861	6.32129E-05	0.00598637	0.539822	0.760992*	0.0196681*	0.0292012	5.63372E-05	0.0228539	0.569765	0.00253937	0.00598637	0*	6.64981E-05*	0.00406030
Octane	0*	0.0238984	12.1959	2.87365E-07	0.0530966	12.8924	12.7579*	0.225624*	0.258672	1.33953E-09	0.000948371	13.6333	0.0239066	0.0530966	0*	7.58013E-10*	0.0680701
Ethylbenzene	0*	0.00134992	0.840327	2.87853E-05	0.00305531	0.888355	0.836992*	0.0108603*	0.0149738	2.53274E-05	0.0114905	0.939571	0.00135040	0.00305531	0*	1.00101E-05*	0.00446580
m-Xylene	0*	0.00126569	0.855790	1.68450E-05	0.00285492	0.904717	0.835992*	0.0131593*	0.0139807	1.39020E-05	0.00977216	0.956952	0.00126614	0.00285492	0*	6.53670E-06*	0.00446046
o-Xylene	0*	0.00176353	1.38287	5.54325E-05	0.00397567	1.46197	1.31099*	0.0117683*	0.0195089	5.07768E-05	0.0154876	1.54655	0.00176416	0.00397567	0*	1.32115E-05*	0.00699482
Nonane	0*	0.00593442	9.56955	7.43415E-08	0.0126727	10.1178	8.14292*	0.0524673*	0.0622271	3.54200E-10	0.000245318	10.7074	0.00593632	0.0126727	0*	5.93457E-11*	0.0434468
C10+	0*	0.000473124	32.0958	1.92746E-07	0.000896446	33.9369	24.4798*	0.00251843*	0.00442395	2.90411E-08	0.000542820	35.9267	0.000473244	0.000896446	0*	6.96083E-11*	0.130613
Molar Flow	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
Water	0*	23.9443	0.0493084	3239.16	0.0138673	0.0354410	0*	1.05883E-06*	0.0227314	3239.13	0.0296395	0.0127096	23.9582	0.0138673	3263.15*	0.00970539*	3263.15
H2S	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
Nitrogen	57.4309*	57.4401	0.00576271	0.00246083	0.00515681	0.000605898	0.0174057*	1.54969E-06*	0.000590647	9.19488E-05	0.00236888	1.52510E-05	57.4452	0.00515681	0*	4.43133E-07*	57.4483
Carbon Dioxide	19.6643*	19.6247	0.0171377	0.0335987	0.00826099	0.00887668	0.0110764*	0.000357059*	0.00719853	0.0207075	0.0128912	0.00167814	19.6329	0.00826099	0*	0.000161883*	19.6754
Methane	9575.67*	9575.87	2.92550	0.813474	2.13953	0.785966	3.94002*	0.00969992*	0.727527	0.0601516	0.753323	0.0584386	9578.01	2.13953	0*	0.000392120*	9579.61
Ethane	1327.55*	1329.07	2.46058	0.161813	0.737354	1.72323	4.14256*	0.0830600*	1.14277	0.0172261	0.144586	0.580460	1329.81	0.737354	0*	8.87919E-05*	1331.69
Propane	331.870*	333.762	2.26470	0.0272777	0.228700	2.03600	4.18370*	0.0428362*	0.695928	0.00211704	0.0251606	1.34007	333.991	0.228700	0*	2.40727E-06*	336.054
Isobutane	40.1902*	40.8607	0.694316	0.00229804	0.0289135	0.665402	1.36714*	0.00638136*	0.111529	0.000127282	0.00217076	0.553873	40.8896	0.0289135	0*	5.20207E-08*	41.5573
n-Butane	66.8151*	68.4647	1.68592	0.00483152	0.0486960	1.63723	3.34032*	0.0113473*	0.198672	0.000346178	0.00448534	1.43855	68.5134	0.0486960	0*	9.68129E-08*	70.1554
2,2-Dimethylpropane	0*	0.0905237	0.00283126	3.03066E-06	6.37404E-05	0.00276751	0.0933580*	1.38128E-05*	0.000266004	1.06711E-07	2.92395E-06	0.00250151	0.0905875	6.37404E-05	0*	2.08849E-11*	0.0933580
Isopentane	18.1941*	19.5609	1.14981	0.000941412	0.0136339	1.13618	2.51750*	0.00310677*	0.0598884	4.87165E-05	0.000892696	1.07629	19.5745	0.0136339	0*	4.98206E-09*	20.7116
n-Pentane	14.8861*	16.4551	1.29629	0.000301064	0.0114857	1.28480	2.86562*	0.00262288*	0.0513559	6.42974E-06	0.000294635	1.23344	16.4666	0.0114857	0*	4.84341E-10*	17.7517
2,2-Dimethylbutane	0*	0.145710	0.0180597	2.49011E-06	0.000100804	0.0179589	0.163772*	2.29585E-05*	0.000456880	4.81521E-08	2.44196E-06	0.0175020	0.145811	0.000100804	0*	2.23723E-12*	0.163772
Cyclopentane	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
2,3-Dimethylbutane	0*	0.226340	0.0379016	8.85510E-06	0.000155698	0.0377459	0.264251*	3.52805E-05*	0.000712284	3.78153E-07	8.47694E-06	0.0370336	0.226496	0.000155698	0*	1.27591E-11*	0.264251
2-Methylpentane	0*	1.44847	0.269125	3.61696E-05	0.000992519	0.268132	1.71763*	0.000224045*	0.00456104	1.05430E-06	3.51153E-05	0.263571	1.44946	0.000992519	0*	3.17402E-11*	1.71763
3-Methylpentane	0*	0.968901	0.200387	6.05207E-05	0.000663369	0.199724	1.16935*	0.000149883*	0.00305413	4.18465E-06	5.63360E-05	0.196670	0.969564	0.000663369	0*	1.12946E-10*	1.16935
n-Hexane	33.9072*	28.8795	7.71817	0.000347604	0.0195885	7.69858	2.69077*	0.00457711*	0.0909445	5.10709E-06	0.000342497	7.60763	28.8991	0.0195885	0*	1.08818E-10*	36.5980
Methylcyclopentane	0*	0.449105	0.119698	4.78147E-05	0.000309117	0.119388	0.568851*	6.46043E-05*	0.00143404	5.25814E-06	4.25566E-05	0.117954	0.449415	0.000309117	0*	1.01992E-10*	0.568851
Benzene	0*	0.0755219	0.0226298	0.000744509	5.22844E-05	0.0225775	0.0988962*	8.27221E-06*	0.000243539	0.000681686	6.28224E-05	0.0223339	0.0755742	5.22844E-05	0*	8.94175E-09*	0.0988962
Cyclohexane	0*	0.413957	0.156373	0.000103231	0.000282002	0.156091	0.570433*	5.92765E-05*	0.00131175	2.30962E-05	8.01348E-05	0.154780	0.414239	0.000282002	0*	3.13243E-10*	0.570433
2-Methylhexane	0*	1.31097	0.759496	2.24464E-05	0.000865709	0.758630	2.07049*	5.43017E-05*	0.00403437	4.52090E-07	2.19944E-05	0.754596	1.31184	0.000865709	0*	1.15208E-12*	2.07049
3-Methylhexane	0*	1.06161	0.684480	2.19706E-05	0.000700643	0.683780	1.74611*	0.000161171*	0.00327613	5.26201E-07	2.14444E-05	0.680503	1.06231	0.000700643	0*	4.41335E-12*	1.74611
2,2,4-Trimethylpentane	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
Heptane	0*	2.19179	1.83128	1.87910E-05	0.00143038	1.82985	4.02310*	0.000315281*	0.00669259	2.04452E-07	1.85865E-05	1.82316	2.19322	0.00143038	0*	1.25204E-12*	4.02310
Methylcyclohexane	0*	1.45467	1.23358	0.000147850	0.000965180	1.23261	2.68839*	0.000216696*	0.00453394	1.61772E-05	0.000131673	1.22808	1.45563	0.000965180	0*	1.01084E-10*	2.68839
Toluene	0*	0.292627	0.307405	0.00204823	0.000195423	0.307209	0.602080*	3.26244E-05*	0.000920544	0.00182489	0.000223337	0.306289	0.292823	0.000195423	0*	6.88336E-09*	0.602080
Octane	0*	2.75502	7.33871	9.31124E-06	0.00173332	7.33698	10.0937*	0.000374252*	0.00815441	4.33903E-08	9.26785E-06	7.32882	2.75675	0.00173332	0*	7.84636E-14*	10.0937
Ethylbenzene	0*	0.155619	0.505657	0.000932704	9.97394E-05	0.505557	0.662209*	1.80144E-05*	0.000472036	0.000820414	0.000112290	0.505085	0.155719	9.97394E-05	0*	1.03617E-09*	0.662209
m-Xylene	0*	0.145910	0.514962	0.000545815	9.31980E-05	0.514869	0.661418*	2.18279E-05*	0.000440729	0.000450317	9.54974E-05	0.514428	0.146003	9.31980E-05	0*	6.76628E-10*	0.661418
o-Xylene	0*	0.203301	0.832126	0.00179613	0.000129784	0.831996	1.03722*	1.95206E-05*	0.000615001	0.00164478	0.000151351	0.831381	0.203431	0.000129784	0*	1.36755E-09*	1.03722
Nonane	0*	0.684124	5.75837	2.40882E-06	0.000413695	5.75795	6.44249*	8.70298E-05*	0.00196166	1.14734E-08	2.39735E-06	5.75599	0.684537	0.000413695	0*	6.14300E-15*	6.44249
C10+	0*	0.0545420	19.3133	6.24536E-06	2.92642E-05	19.3133	19.3678*	4.17743E-06*	0.000139461	9.40707E-07	5.30465E-06	19.3131	0.0545713	2.92642E-05	0*	7.20530E-15*	19.3678
Mass Fraction	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water	0*	0.192517	0.0127206	99.9626	0.327528	0.00924408	0*	0.000289729*	0.353986	99.9948	2.76431	0.00337152	0.192563	0.327528	100*	91.5135*	20.3115
H2S	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
Nitrogen	0.724140*	0.718134	0.00231174	0.000118090	0.189392	0.000245743	0.00575889*	0.000659379*	0.0143025	4.41388E-06	0.343546	6.29094E-06	0.717954	0.189392	0*	0.00649727*	0.556041
Carbon Dioxide	0.389526*	0.385455	0.0108005	0.00253299	0.476643	0.00565605	0.00575738*	0.238677*	0.273848	0.00156164	2.93707	0.00108750	0.385486	0.476643	0*	3.72888*	0.299181
Methane	69.1435*	68.5605	0.672074	0.0223553	44.9992	0.182554	0.746536*	2.36354*	10.0888	0.00165359	62.5644	0.0138046	68.5524	44.9992	0*	3.29247*	53.0985
Ethane	17.9672*	17.8358	1.05951	0.00833482	29.0677	0.750203	1.47119*	37.9345*	29.7028	0.000887596	22.5072	0.257006	17.8396	29.0677	0*	1.39741*	13.8353
Propane	6.58680*	6.56836	1.43005	0.00206048	13.2214	1.29984	2.17890*	28.6899*	26.5264	0.000159968	5.74371	0.870112	6.57062	13.2214	0*	0.0555586*	5.11998
Isobutane	1.05141*	1.05992	0.577891	0.000228804	2.20322	0.559941	0.938504*	5.63350*	5.60338	1.26771E-05	0.653173	0.474028	1.06031	2.20322	0*	0.00158252*	0.834551
n-Butane	1.74795*	1.77596	1.40322	0.000481050	3.71065	1.37774	2.29303*	10.0175*	9.98154	3.44786E-05	1.34962	1.23118	1.77662	3.71065	0*	0.00294514*	1.40886
2,2-Dimethylpropane	0*	0.00291485	0.00292519	3.74568E-07	0.00602919	0.00289091	0.0795539*	0.0151368*	0.0165896	1.31931E-08	0.00109213	0.00265756	0.00291591	0.00602919	0*	7.88666E-07*	0.00232726
Isopentane	0.590841*	0.629856	1.18796	0.000116352	1.28963	1.18684	2.14526*	3.40457*	3.73500	6.02301E-06	0.333432	1.14343	0.630081	1.28963	0*	0.000188135*	0.516305
n-Pentane	0.483416*	0.529852	1.33930	3.72094E-05	1.08643	1.34209	2.44190*	2.87430*	3.20286	7.94933E-07	0.110049	1.31039	0.530041	1.08643	0*	1.82899E-05*	0.442520
2,2-Dimethylbutane	0*	0.00560398	0.0222864	3.67593E-07	0.0113887	0.0224067	0.166688*	0.0300503*	0.0340333	7.11061E-09	0.00108942	0.0222087	0.00560595	0.0113887	0*	1.00908E-07*	0.00487626
Cyclopentane	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
2,3-Dimethylbutane	0*	0.00870501	0.0467721	1.30720E-06	0.0175906	0.0470943	0.268955*	0.0461786*	0.0530585	5.58417E-08	0.00378179	0.0469928	0.00870803	0.0175906	0*	5.75485E-07*	0.00786797
2-Methylpentane	0*	0.0557079	0.332111	5.33940E-06	0.112134	0.334540	1.74821*	0.293253*	0.339755	1.55689E-07	0.0156659	0.334451	0.0557271	0.112134	0*	1.43161E-06*	0.0511418
3-Methylpentane	0*	0.0372638	0.247286	8.93412E-06	0.0749468	0.249189	1.19017*	0.196182*	0.227504	6.17946E-07	0.0251330	0.249559	0.0372766	0.0749468	0*	5.09433E-06*	0.0348170
n-Hexane	1.31518*	1.11070	9.52453	5.13136E-05	2.21310	9.60527	2.73867*	5.99098*	6.77451	7.54163E-07	0.152797	9.65349	1.11107	2.21310	0*	4.90812E-06*	1.08969
Methylcyclopentane	0*	0.0168685	0.144256	6.89334E-06	0.0341068	0.145473	0.565435*	0.0825825*	0.104324	7.58305E-07	0.0185415	0.146174	0.0168743	0.0341068	0*	4.49263E-06*	0.0165411
Benzene	0*	0.00263278	0.0253130	9.96211E-05	0.00535432	0.0255334	0.0912383*	0.00981435*	0.0164439	9.12452E-05	0.0254043	0.0256882	0.00263370	0.00535432	0*	0.000365570*	0.00266907
Cyclohexane	0*	0.0155483	0.188457	1.48826E-05	0.0311150	0.190195	0.567007*	0.0757720*	0.0954275	3.33083E-06	0.0349140	0.191809	0.0155536	0.0311150	0*	1.37980E-05*	0.0165871
2-Methylhexane	0*	0.0586265	1.08980	3.85291E-06	0.113727	1.10058	2.45036*	0.0826443*	0.349439	7.76264E-08	0.0114094	1.11338	0.0586452	0.113727	0*	6.04215E-08*	0.0716825
3-Methylhexane	0*	0.0474750	0.982163	3.77123E-06	0.0920425	0.991993	2.06647*	0.245294*	0.283763	9.03517E-08	0.0111241	1.00406	0.0474902	0.0920425	0*	2.31460E-07*	0.0604521
2,2,4-Trimethylpentane	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
Heptane	0*	0.0980167	2.62772	3.22545E-06	0.187907	2.65466	4.76121*	0.479841*	0.579681	3.51055E-08	0.00964161	2.69001	0.0980473	0.187907	0*	6.56637E-08*	0.139284
Methylcyclohexane	0*	0.0637438	1.73445	2.48678E-05	0.124243	1.75224	3.11762*	0.323165*	0.384809	2.72183E-06	0.0669302	1.77553	0.0637644	0.124243	0*	5.19473E-06*	0.0912024
Toluene	0*	0.0120332	0.405600	0.000323284	0.0236065	0.409818	0.655203*	0.0456569*	0.0733169	0.000288129	0.106531	0.415550	0.0120371	0.0236065	0*	0.000331950*	0.0191672
Octane	0*	0.140451	12.0044	1.82199E-06	0.259578	12.1341	13.6178*	0.649326*	0.805167	8.49329E-09	0.00548061	12.3271	0.140491	0.259578	0*	4.69109E-09*	0.398373
Ethylbenzene	0*	0.00737342	0.768747	0.000169625	0.0138824	0.777084	0.830342*	0.0290485*	0.0433187	0.000149253	0.0617161	0.789583	0.00737564	0.0138824	0*	5.75763E-05*	0.0242907
m-Xylene	0*	0.00691338	0.782894	9.92639E-05	0.0129719	0.791397	0.829350*	0.0351979*	0.0404456	8.19235E-05	0.0524866	0.804189	0.00691544	0.0129719	0*	3.75978E-05*	0.0242617
o-Xylene	0*	0.00963265	1.26508	0.000326651	0.0180642	1.27885	1.30057*	0.0314773*	0.0564385	0.000299224	0.0831843	1.29967	0.00963552	0.0180642	0*	7.59898E-05*	0.0380467
Nonane	0*	0.0391592	10.5760	5.29229E-07	0.0695617	10.6920	9.75909*	0.169538*	0.217479	2.52158E-09	0.00159177	10.8704	0.0391695	0.0695617	0*	4.12369E-10*	0.285491
C10+	0*	0.00435964	49.5334	1.91610E-06	0.00687143	50.0803	40.9692*	0.0113639*	0.0215908	2.88708E-07	0.00491845	50.9331	0.00436050	0.00687143	0*	6.75428E-10*	1.19851
Mass Flow	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
Water	0*	431.364	0.888304	58354.3	0.249824	0.638480	0*	1.90751E-05*	0.409513	58353.8	0.533964	0.228968	431.614	0.249824	58786.5*	0.174845*	58786.5
H2S	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
Nitrogen	1608.84*	1609.09	0.161433	0.0689362	0.144460	0.0169733	0.487594*	4.34122E-05*	0.0165460	0.00257580	0.0663604	0.000427232	1609.24	0.144460	0*	1.24136E-05*	1609.32
Carbon Dioxide	865.418*	863.672	0.754220	1.47866	0.363562	0.390658	0.487466*	0.0157140*	0.316804	0.911326	0.567335	0.0738542	864.036	0.363562	0*	0.00712438*	865.905
Methane	153617*	153621	46.9322	13.0501	34.3234	12.6088	63.2077*	0.155611*	11.6713	0.964980	12.0852	0.937498	153655	34.3234	0*	0.00629058*	153681

Ethane	39918.2*	39963.9	73.9874	4.86555	22.1715	51.8159	124.563*	2.49753*	34.3620	0.517973	4.34757	17.4539	39986.0	22.1715	0*	0.00266989*	40042.7
Propane	14634.0*	14717.4	99.8633	1.20283	10.0847	89.7786	184.483*	1.88889*	30.6874	0.0933523	1.10947	59.0912	14727.5	10.0847	0*	0.000106150*	14818.5
Isobutane	2335.94*	2374.91	40.3552	0.133567	1.68051	38.6747	79.4612*	0.370899*	6.48234	0.00739792	0.126169	32.1923	2376.59	1.68051	0*	3.02356E-06*	2415.40
n-Butane	3883.44*	3979.32	97.9894	0.280818	2.83032	95.1591	194.147*	0.659532*	11.5473	0.0201206	0.260698	83.6119	3982.15	2.83032	0*	5.62698E-06*	4077.59
2,2-Dimethylpropane	0*	6.53118	0.204272	0.000218658	0.00459879	0.199673	6.73567*	0.000996578*	0.0191919	7.69906E-06	0.000210959	0.180481	6.53577	0.00459879	0*	1.50682E-09*	6.73567
Isopentane	1312.68*	1411.29	82.9575	0.0679217	0.983672	81.9738	181.635*	0.224150*	4.32088	0.00351484	0.0644069	77.6529	1412.28	0.983672	0*	3.59449E-07*	1494.32
n-Pentane	1074.01*	1187.22	93.5255	0.0217214	0.828680	92.6968	206.751*	0.189238*	3.70527	0.000463898	0.0212575	88.9915	1188.05	0.828680	0*	3.49446E-08*	1280.76
2,2-Dimethylbutane	0*	12.5566	1.55630	0.000214586	0.00868679	1.54761	14.1131*	0.00197845*	0.0393718	4.14952E-06	0.000210437	1.50824	12.5653	0.00868679	0*	1.92794E-10*	14.1131
Cyclopentane	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
2,3-Dimethylbutane	0*	19.5049	3.26618	0.000763091	0.0134173	3.25276	22.7719*	0.00304031*	0.0613813	3.25875E-05	0.000730504	3.19138	19.5184	0.0134173	0*	1.09952E-09*	22.7719
2-Methylpentane	0*	124.822	23.1919	0.00311693	0.0855307	23.1064	148.017*	0.0193072*	0.393050	9.08550E-05	0.00302608	22.7133	124.908	0.0855307	0*	2.73522E-09*	148.017
3-Methylpentane	0*	83.4954	17.2685	0.00521539	0.0571661	17.2113	100.769*	0.0129162*	0.263191	0.000360614	0.00485478	16.9481	83.5525	0.0571661	0*	9.73320E-09*	100.769
n-Hexane	2921.97*	2488.70	665.116	0.0299549	1.68805	663.428	231.878*	0.394434*	7.83717	0.000440105	0.0295148	655.590	2490.39	1.68805	0*	9.37744E-09*	3153.84
Methylcyclopentane	0*	37.7965	10.0737	0.00402406	0.0260151	10.0477	47.8742*	0.00543706*	0.126688	0.000442523	0.00358154	9.92698	37.8225	0.0260151	0*	8.58360E-09*	47.8742
Benzene	0*	5.89916	1.76765	0.0581549	0.00408403	1.76357	7.72496*	0.000646157*	0.0190233	0.0532478	0.00490718	1.74454	5.90324	0.00408403	0*	6.98457E-07*	7.72496
Cyclohexane	0*	34.8384	13.1603	0.00868787	0.0237331	13.1366	48.0074*	0.00498868*	0.110396	0.00194376	0.00674411	13.0262	34.8621	0.0237331	0*	2.63624E-08*	48.0074
2-Methylhexane	0*	131.362	76.1030	0.00224918	0.0867457	76.0162	207.467*	0.00544113*	0.404252	4.53003E-05	0.00220388	75.6120	131.449	0.0867457	0*	1.15441E-10*	207.467
3-Methylhexane	0*	106.375	68.5862	0.00220150	0.0702058	68.5160	174.964*	0.0161497*	0.328274	5.27263E-05	0.00214877	68.1878	106.445	0.0702058	0*	4.42226E-10*	174.964
2,2,4-Trimethylpentane	0*	0	0	0	0	0	0*	0*	0	0	0	0	0	0	0*	0*	0
Heptane	0*	219.622	183.498	0.00188289	0.143327	183.355	403.122*	0.0315918*	0.670610	2.04865E-05	0.00186241	182.684	219.765	0.143327	0*	1.25457E-10*	403.122
Methylcyclohexane	0*	142.828	121.120	0.0145168	0.0947673	121.025	263.963*	0.0212765*	0.445170	0.00158837	0.0129285	120.580	142.923	0.0947673	0*	9.92503E-09*	263.963
Toluene	0*	26.9622	28.3238	0.188721	0.0180060	28.3058	55.4747*	0.00300596*	0.0848175	0.168143	0.0205779	28.2209	26.9802	0.0180060	0*	6.34222E-07*	55.4747
Octane	0*	314.702	838.290	0.00106361	0.197995	838.092	1152.99*	0.0427503*	0.931466	4.95641E-06	0.00105865	837.161	314.900	0.197995	0*	2.96278E-12*	1152.99
Ethylbenzene	0*	16.5213	53.6831	0.0990205	0.0105888	53.6725	70.3034*	0.00191249*	0.0501137	0.0870992	0.0119213	53.6224	16.5319	0.0105888	0*	1.10005E-07*	70.3034
m-Xylene	0*	15.4905	54.6709	0.0579464	0.00989437	54.6610	70.2194*	0.00231736*	0.0467899	0.0478079	0.0101385	54.6143	15.5004	0.00989437	0*	7.18342E-08*	70.2194
o-Xylene	0*	21.5835	88.3426	0.190686	0.0137785	88.3289	110.117*	0.00207240*	0.0652915	0.174618	0.0160682	88.2636	21.5973	0.0137785	0*	1.45186E-07*	110.117
Nonane	0*	87.7423	738.540	0.000308943	0.0530585	738.487	826.283*	0.0111620*	0.251593	1.47152E-06	0.000307472	738.235	87.7954	0.0530585	0*	7.87870E-13*	826.283
C10+	0*	9.76847	3459.01	0.00111854	0.00524121	3459.00	3468.78*	0.000748178*	0.0249775	0.000168481	0.000950064	3458.98	9.77371	0.00524121	0*	1.29047E-12*	3468.78

Process Streams		**Gas**	**HP Separator Gas**	**HP Separator Oil**	**HP Separator Water**	**LP Separator Gas**	**LP Separator Oil**	**Oil**	**Oil W/B**	**OT Flash Gas**	**Produced Water**	**PWT Flash Gas**	**Sales Oil**	**Total gas to sale**	**Vapor recovery by VRU (to sale)**	**Water**	**Water W/B**	**Well Stream**
Properties	**Status:**	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Total**	**From Block:**	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	2 Phase Separator	2 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	HP Compressor Engine	--	--	MIX-101
	To Block:	MIX-101	MIX-100	2 Phase Separator	PW Tanks	HP Compressor Engine	Condensate Tanks	MIX-101	--	--	--	--	--	--	MIX-100	MIX-101	--	3 Phase Separator
Property	**Units**																	
Temperature	°F	85*	70*	70	70	70	70*	85*	75.9425*	75.94*	75.94	75.94*	75.94	69.9990	70*	85*	75.9425*	84.3964
Pressure	psig	1000*	169*	169	169	50	50*	1000*	4.46633	0*	0	0*	0	169	169*	1000*	-14.2224	1000
Mole Fraction Vapor	%	100	100	0	0	100	0	0	100*	100	0	100	0	100	99.4884	0	100*	77.2774
Mole Fraction Light Liquid	%	0	0	100	100	0	100	100	0	0	100	0	100	0	0.292232	100	0	0.746520
Mole Fraction Heavy Liquid	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0.219408	0	0	21.9761
Molecular Weight	lb/lbmol	19.3425	19.4366	116.050	18.0162	23.3654	121.367	107.015	39.6915	36.6976	18.0156	19.7662	126.332	19.4377	23.3654	18.0153	18.4577	19.5182
Mass Density	lb/ft^3	4.11281	0.655023	45.6556	62.2671	0.271783	45.9207	44.8897	0.134732	0.0949227	62.2225	0.0507033	46.0067	0.655066	0.807867	62.1852	0.00152127	5.27421
Molar Flow	lbmol/h	11486.2	11528.1	60.1738	3240.21	3.26446	56.9094	79.1177	0.165874	3.15242	3239.23	53.7570	11531.3	0.977239	3.26446	3263.15	0.0103512	14828.4
Mass Flow	lb/h	222172	224066	6983.19	58376.1	76.2755	6906.91	8466.80	6.58380*	115.686	58356.8	19.3163	6791.22	224142	76.2755	58786.5	0.191060*	289425
Vapor Volumetric Flow	ft^3/h	54019.5	342073	152.954	937.512	280.648	150.409	188.614	48.8660	1218.74	937.873	380.968	147.614	342167	94.4159	945.347	125.592	54875.5
Liquid Volumetric Flow	gpm	6734.90	42648.1	19.0695	116.885	34.9899	18.7523	23.5155	6.09239	151.947	116.930	47.4973	18.4038	42659.8	11.7713	117.861	15.6583	6841.62
Std Vapor Volumetric Flow	MMSCFD	104.612*	104.993	0.548040	29.5106	0.0297315	0.518309	0.720574	0.00151072	0.0287110	29.5017	0.00890032	0.489598	105.023	0.0297315	29.7195	9.42749E-05	135.052
Std Liquid Volumetric Flow	sgpm	1349.86	1355.14	19.3158	116.781	0.423828	18.8919	23.8565*	0.0291401	0.517032	116.667	0.113913	18.3749	1355.56	0.423828	117.519*	0.000424359	1491.23
Compressibility		0.816421	0.958944	0.0821453	0.00935049	0.978494	0.0300815	0.413845	0.982113	0.988446	0.000740265	0.996719	0.00702067	0.958939	0.934682	0.0502914	0.999551	0.643137
Specific Gravity		0.667845	0.671091	0.732024	0.998366	0.806743	0.736275	0.719743	1.37044	1.26707	0.997651	0.682474	0.737652	0.671130		0.997052	0.637294	
API Gravity				60.5518	10.0320		59.4779	61.8927			10.0026		58.4513			9.87799		
Enthalpy	Btu/h	-3.91985E+08	-3.89897E+08	-5.92241E+06	-3.98466E+08	-116874	-5.79724E+06	-7.23618E+06	-7132.07	-133764	-3.98112E+08	-36287.8	-5.62638E+06	-3.90014E+08	-117551	-4.00371E+08	-1052.42	-7.99592E+08
Mass Enthalpy	Btu/lb	-1764.33	-1740.10	-848.096	-6825.84	-1532.27	-839.339	-854.654	-1083.28	-1156.26	-6822.04	-1878.61	-828.478	-1740.03	-1541.14	-6810.58	-5508.35	-2762.69
Mass Cp	Btu/(lb*°F)	0.660192	0.511229	0.490937	0.982120	0.467963	0.488552	0.500250	0.410960	0.418384	0.981761	0.481453	0.489902	0.511220	0.488706	0.979420	0.441957	0.721972
Ideal Gas CpCv Ratio		1.26187	1.26477	1.04772	1.32582	1.22718	1.04566	1.05070	1.14009	1.14965	1.32555	1.26485	1.04342	1.26475	1.22718	1.32512	1.32193	1.26752
Dynamic Viscosity	cP	0.0130540	0.0108593	0.595234	0.995421	0.0102270	0.652592	0.503007	0.00869259	0.00895784	0.924426	0.0108463	0.681257	0.0108592		0.840378	0.0102820	
Kinematic Viscosity	cSt	0.198145	1.03496	0.813903	0.997993	2.34912	0.887181	0.699531	4.02772	5.89132	0.927478	13.3543	0.924421	1.03488		0.843659	421.943	
Thermal Conductivity	Btu/(h*ft*°F)	0.0226629	0.0181807	0.0694420	0.346573	0.0161502	0.0697393	0.0676959	0.0111828	0.0122544	0.349778	0.0174826	0.0697222	0.0181802		0.353848	0.0122783	
Surface Tension	lbf/ft			0.00149055?	0.00502990?		0.00158072	0.000843943			0.00498763?		0.00160797			0.00492045		
Net Ideal Gas Heating Value	Btu/ft^3	1063.82	1066.40	5826.30	0.346406	1264.60	6087.98	5383.32	2089.59	1930.65	0.0352218	1031.82	6331.77	1066.45	1264.60	0	48.9286	852.766
Net Liquid Heating Value	Btu/lb	20825.3	20771.4	18888.6	-1052.09	20450.7	18871.3	18916.9	19824.7	19818.3	-1058.97	19729.9	18855.2	20771.3	20450.7	-1059.76	31.1548	16324.6
Gross Ideal Gas Heating Value	Btu/ft^3	1175.17	1177.94	6252.42	50.6758	1390.38	6531.32	5781.79	2274.24	2104.07	50.3469	6790.94	1140.88	1178.00	1390.38	50.3101	101.254	952.213
Gross Liquid Heating Value	Btu/lb	23009.8	22949.3	20281.3	8.02634	22493.5	20256.9	20328.5	21590.1	21611.4	0.805272	21823.7	20233.8	22949.1	22493.5	0	1106.95	18257.7

Process Streams		**Gas**	**HP Separator Gas**	**HP Separator Oil**	**HP Separator Water**	**LP Separator Gas**	**LP Separator Oil**	**Oil**	**Oil W/B**	**OT Flash Gas**	**Produced Water**	**PWT Flash Gas**	**Sales Oil**	**Total gas to sale**	**Vapor recovery by VRU (to sale)**	**Water**	**Water W/B**	**Well Stream**
Composition	**Status:**	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Vapor**	**From Block:**	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	2 Phase Separator	2 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	HP Compressor Engine	--	--	MIX-101
	To Block:	MIX-101	MIX-100	2 Phase Separator	PW Tanks	HP Compressor Engine	Condensate Tanks	MIX-101	--	--	--	--	--	--	MIX-100	MIX-101	--	3 Phase Separator
Mole Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water		0	0.207705			0.424797		0.000638334	0.721079			3.03299		0.207766	0.206408		93.7609	0.0746104
H2S		0	0			0		0	0			0		0	0		0	0
Nitrogen		0.5	0.498263			0.157968		0.000934258	0.0187363			0.242406		0.498167	0.158772		0.00428097	0.500644
Carbon Dioxide		0.1712	0.170234			0.253058		0.215259	0.228350			1.31914		0.170257	0.254225		1.56390	0.169632
Methane		83.3669	83.0658			65.5401		5.84776	23.0784			77.0868		83.0608	65.8645		3.78816	83.3381
Ethane		11.5578	11.5290			22.5873		50.0741	36.2506			14.7954		11.5321	22.6771		0.857792	11.4943
Propane		2.8893	2.89521			7.00576		25.8245	22.0760			2.57466		2.89638	7.01456		0.0232559	2.85360
Isobutane		0.3499	0.354445			0.885703		3.84711	3.53790			0.222131		0.354596	0.881804		0.000502557	0.344493
n-Butane		0.5817	0.593896			1.49170		6.84093	6.30222			0.458981		0.594150	1.47866		0.000935280	0.571888
2,2-Dimethylpropane		0	0.000785246			0.00195255		0.00832728	0.00843809			0.000299205		0.000785577	0.00192974		2.01763E-07	0.000754570
Isopentane		0.1584	0.169680			0.417647		1.87297	1.89976			0.0913487		0.169751	0.408558		4.81302E-05	0.160774
n-Pentane		0.1296	0.142740			0.351841		1.58125	1.62910			0.0301497		0.142799	0.339373		4.67908E-06	0.133612
2,2-Dimethylbutane		0	0.00126396			0.00308791		0.0138409	0.0144930			0.000249884		0.00126447	0.00290139		2.16132E-08	0.00116363
Cyclopentane		0	0			0		0	0			0		0	0		0	0
2,3-Dimethylbutane		0	0.00196338			0.00476948		0.0212694	0.0225949			0.000867438		0.00196418	0.00438252		1.23262E-07	0.00179178
2-Methylpentane		0	0.0125647			0.0304037		0.135069	0.144684			0.00359332		0.0125698	0.0276771		3.06633E-07	0.0114747
3-Methylpentane		0	0.00840471			0.0203209		0.0903593	0.0968822			0.00576481		0.00840809	0.0183071		1.09114E-06	0.00764052
n-Hexane		0.2952	0.250514			0.600054		2.75938	2.88491			0.0350474		0.250613	0.524941		1.05126E-06	0.228728
Methylcyclopentane		0	0.00389576			0.00946914		0.0389478	0.0454901			0.00435478		0.00389734	0.00830467		9.85315E-07	0.00346725
Benzene		0	0.000655114			0.00160162		0.00498704	0.00772548			0.00642856		0.000655382	0.00140591		8.63836E-05	0.000578891
Cyclohexane		0	0.00359086			0.00863854		0.0357358	0.0416110			0.00820013		0.00359229	0.00732327		3.02615E-06	0.00322232
2-Methylhexane		0	0.0113720			0.0265192		0.0327367	0.127977			0.00225066		0.0113763	0.0202854		1.11299E-08	0.0107526
3-Methylhexane		0	0.00920891			0.0214627		0.0971649	0.103924			0.00219439		0.00921238	0.0159955		4.26360E-08	0.00873850
2,2,4-Trimethylpentane		0	0			0		0	0			0		0	0		0	0
Heptane		0	0.0190127			0.0438167		0.190072	0.212300			0.00190194		0.0190197	0.0306815		1.20956E-08	0.0187262
Methylcyclohexane		0	0.0126185			0.0295663		0.130639	0.143824			0.0134740		0.0126233	0.0204394		9.76541E-07	0.0118508
Toluene		0	0.00253839			0.00598637		0.0196681	0.0292012			0.0228539		0.00253937	0.00411315		6.64981E-05	0.00238946
Octane		0	0.0238984			0.0530966		0.225624	0.258672			0.000948371		0.0239066	0.0227286		7.58013E-10	0.0292319
Ethylbenzene		0	0.00134992			0.00305531		0.0108603	0.0149738			0.0114905		0.00135040	0.00128202		1.00101E-05	0.00159979
m-Xylene		0	0.00126569			0.00285492		0.0131593	0.0139807			0.00977216		0.00126614	0.00114845		6.53670E-06	0.00153048
o-Xylene		0	0.00176353			0.00397567		0.0117683	0.0195089			0.0154876		0.00176416	0.00145007		1.32115E-05	0.00217757
Nonane		0	0.00593442			0.0126727		0.0524673	0.0622271			0.000245318		0.00593632	0.00240038		5.93457E-11	0.0100476
C10+		0	0.000473124			0.000896446		0.00251843	0.00442395			0.000542820		0.000473244	6.06851E-06		6.96083E-11	0.00249715
Molar Flow		lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
Water		0	23.9443			0.0138673		1.05883E-06	0.0227314			0.0296395		23.9582	0.00670364		0.00970539	8.54964
H2S		0	0			0		0	0			0		0	0		0	0
Nitrogen		57.4309	57.4401			0.00515681		1.54969E-06	0.000590647			0.00236888		57.4452	0.00515652		4.43133E-07	57.3690
Carbon Dioxide		19.6643	19.6247			0.00826099		0.000357059	0.00719853			0.0128912		19.6329	0.00825662		0.000161883	19.4382
Methane		9575.67	9575.87			2.13953		0.00969992	0.727527			0.753323		9578.01	2.13912		0.000392120	9549.74
Ethane		1327.55	1329.07			0.737354		0.0830600	1.14277			0.144586		1329.81	0.736498		8.87919E-05	1317.13
Propane		331.870	333.762			0.228700		0.0428362	0.695928			0.0251606		333.991	0.227816		2.40727E-06	326.995
Isobutane		40.1902	40.8607			0.0289135		0.00638136	0.111529			0.00217076		40.8896	0.0286389		5.20207E-08	39.4755

n-Butane	66.8151	68.4647			0.0486960			0.0113473	0.198672		0.00448534		68.5134	0.0480232		9.68129E-08	65.5329
2,2-Dimethylpropane	0	0.0905237			6.37404E-05			1.38128E-05	0.000266004		2.92395E-06		0.0905875	6.26732E-05		2.08849E-11	0.0864665
Isopentane	18.1941	19.5609			0.0136339			0.00310677	0.0598884		0.000892696		19.5745	0.0132138		4.98206E-09	18.4231
n-Pentane	14.8861	16.4551			0.0114857			0.00262288	0.0513559		0.000294635		16.4666	0.0110220		4.84341E-10	15.3107
2,2-Dimethylbutane	0	0.145710			0.000100804			2.29585E-05	0.000456880		2.44196E-06		0.145811	9.42302E-05		2.23723E-12	0.133341
Cyclopentane	0	0			0			0	0		0		0	0		0	0
2,3-Dimethylbutane	0	0.226340			0.000155698			3.52805E-05	0.000712284		8.47694E-06		0.226496	0.000142334		1.27591E-11	0.205321
2-Methylpentane	0	1.44847			0.000992519			0.000224045	0.00456104		3.51153E-05		1.44946	0.000898886		3.17402E-11	1.31489
3-Methylpentane	0	0.968901			0.000663369			0.000149883	0.00305413		5.63360E-05		0.969564	0.000594572		1.12946E-10	0.875529
n-Hexane	33.9072	28.8795			0.0195885			0.00457711	0.0909445		0.000342497		28.8991	0.0170488		1.08818E-10	26.2101
Methylcyclopentane	0	0.449105			0.000309117			6.46043E-05	0.00143404		4.25566E-05		0.449415	0.000269716		1.01992E-10	0.397313
Benzene	0	0.0755219			5.22844E-05			8.27221E-06	0.000243539		6.28224E-05		0.0755742	4.56605E-05		8.94175E-09	0.0663354
Cyclohexane	0	0.413957			0.000282002			5.92765E-05	0.00131175		8.01348E-05		0.414239	0.000238138		3.13243E-10	0.369247
2-Methylhexane	0	1.31097			0.000865709			5.43017E-05	0.00403437		2.19944E-05		1.31184	0.000658821		1.15208E-12	1.23214
3-Methylhexane	0	1.06161			0.000700643			0.000161171	0.00327613		2.14444E-05		1.06231	0.000519495		4.41335E-12	1.00135
2,2,4-Trimethylpentane	0	0			0			0	0		0		0	0		0	0
Heptane	0	2.19179			0.00143038			0.000315281	0.00669259		1.85865E-05		2.19322	0.000996462		1.25204E-12	2.14584
Methylcyclohexane	0	1.45467			0.000965180			0.000216696	0.00453394		0.000131673		1.45563	0.000663822		1.01084E-10	1.35799
Toluene	0	0.292627			0.000195423			3.26244E-05	0.000920544		0.000223337		0.292823	0.000133585		6.88336E-09	0.273808
Octane	0	2.75502			0.00173332			0.000374252	0.00815441		9.26785E-06		2.75675	0.000738172		7.84636E-14	3.34970
Ethylbenzene	0	0.155619			9.97394E-05			1.80144E-05	0.000472036		0.000112290		0.155719	4.16369E-05		1.03617E-09	0.183321
m-Xylene	0	0.145910			9.31980E-05			2.18279E-05	0.000440729		9.54974E-05		0.146003	3.72990E-05		6.76628E-10	0.175378
o-Xylene	0	0.203301			0.000129784			1.95206E-05	0.000615001		0.000151351		0.203431	4.70950E-05		1.36755E-09	0.249529
Nonane	0	0.684124			0.000413695			8.70298E-05	0.00196166		2.39735E-06		0.684537	7.79585E-05		6.14300E-15	1.15136
C10+	0	0.0545420			2.92642E-05			4.17743E-06	0.000139461		5.30465E-06		0.0545713	1.97091E-07		7.20530E-15	0.286149
Mass Fraction	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Water	0	0.192517			0.327528			0.000289729	0.353986		2.76431		0.192563	0.160141		91.5135	0.0693255
H2S	0	0			0			0	0		0		0	0		0	0
Nitrogen	0.724140	0.718134			0.189392			0.000659379	0.0143025		0.343546		0.717954	0.191546		0.00649727	0.723349
Carbon Dioxide	0.389526	0.385455			0.476643			0.238677	0.273848		2.93707		0.385486	0.481836		3.72888	0.385040
Methane	69.1435	68.5605			44.9992			2.36354	10.0888		62.5644		68.5524	45.5049		3.29247	68.9552
Ethane	17.9672	17.8358			29.0677			37.9345	29.7028		22.5072		17.8396	29.3658		1.39741	17.8260
Propane	6.58680	6.56836			13.2214			28.6899	26.5264		5.74371		6.57062	13.3208		0.0555586	6.48994
Isobutane	1.05141	1.05992			2.20322			5.63350	5.60338		0.653173		1.06031	2.20724		0.00158252	1.03270
n-Butane	1.74795	1.77596			3.71065			10.0175	9.98154		1.34962		1.77662	3.70121		0.00294514	1.71438
2,2-Dimethylpropane	0	0.00291485			0.00602919			0.0151368	0.0165896		0.00109213		0.00291591	0.00599600		7.88666E-07	0.00280790
Isopentane	0.590841	0.629856			1.28963			3.40457	3.73500		0.333432		0.630081	1.26417		0.000188135	0.598270
n-Pentane	0.483416	0.529852			1.08643			2.87430	3.20286		0.110049		0.530041	1.05449		1.82899E-05	0.497196
2,2-Dimethylbutane	0	0.00560398			0.0113887			0.0300503	0.0340333		0.00108942		0.00560595	0.0107677		1.00908E-07	0.00517192
Cyclopentane	0	0			0			0	0		0		0	0		0	0
2,3-Dimethylbutane	0	0.00870501			0.0175906			0.0461786	0.0530585		0.00378179		0.00870803	0.0162646		5.75485E-07	0.00796381
2-Methylpentane	0	0.0557079			0.112134			0.293253	0.339755		0.0156659		0.0557271	0.102716		1.43161E-06	0.0510007
3-Methylpentane	0	0.0372638			0.0749468			0.196182	0.227504		0.0251330		0.0372766	0.0679421		5.09433E-06	0.0339593
n-Hexane	1.31518	1.11070			2.21310			5.99098	6.77451		0.152797		1.11107	1.94818		4.90812E-06	1.01661
Methylcyclopentane	0	0.0168685			0.0341068			0.0825825	0.104324		0.0185415		0.0168743	0.0300996		4.49263E-06	0.0150502
Benzene	0	0.00263278			0.00535432			0.00981435	0.0164439		0.0254043		0.00263370	0.00472942		0.000365570	0.00233220
Cyclohexane	0	0.0155483			0.0311150			0.0757720	0.0954275		0.0349140		0.0155536	0.0265756		1.37980E-05	0.0139870
2-Methylhexane	0	0.0586265			0.113727			0.0826443	0.349439		0.0114094		0.0586452	0.0875376		6.04215E-08	0.0555702
3-Methylhexane	0	0.0474750			0.0920425			0.245294	0.283763		0.0111241		0.0474902	0.0690253		2.31460E-07	0.0451612
2,2,4-Trimethylpentane	0	0			0			0	0		0		0	0		0	0
Heptane	0	0.0980167			0.187907			0.479841	0.579681		0.00964161		0.0980473	0.132400		6.56637E-08	0.0967782
Methylcyclohexane	0	0.0637438			0.124243			0.323165	0.384809		0.0669302		0.0637644	0.0864276		5.19473E-06	0.0600137
Toluene	0	0.0120332			0.0236065			0.0456569	0.0733169		0.106531		0.0120371	0.0163211		0.000331950	0.0113551
Octane	0	0.140451			0.259578			0.649326	0.805167		0.00548061		0.140491	0.111811		4.69109E-09	0.172220
Ethylbenzene	0	0.00737342			0.0138824			0.0290485	0.0433187		0.0617161		0.00737564	0.00586152		5.75763E-05	0.00875987
m-Xylene	0	0.00691338			0.0129719			0.0351979	0.0404456		0.0524866		0.00691544	0.00525085		3.75978E-05	0.00838033
o-Xylene	0	0.00963265			0.0180642			0.0314773	0.0564385		0.0831843		0.00963552	0.00662990		7.59898E-05	0.0119236
Nonane	0	0.0391592			0.0695617			0.169538	0.217479		0.00159177		0.0391695	0.0132583		4.12369E-10	0.0664644
C10+	0	0.00435964			0.00687143			0.0113639	0.0215908		0.00491845		0.00436050	4.68072E-05		6.75428E-10	0.0230671
Mass Flow	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**
Water	0	431.364			0.249824			1.90751E-05	0.409513		0.533964		431.614	0.120768		0.174845	154.024
H2S	0	0			0			0	0		0		0	0		0	0
Nitrogen	1608.84	1609.09			0.144460			4.34122E-05	0.0165460		0.0663604		1609.24	0.144452		1.24136E-05	1607.10
Carbon Dioxide	865.418	863.672			0.363562			0.0157140	0.316804		0.567335		864.036	0.363370		0.00712438	855.464
Methane	153617	153621			34.3234			0.155611	11.6713		12.0852		153655	34.3168		0.00629058	153201
Ethane	39918.2	39963.9			22.1715			2.49753	34.3620		4.34757		39986.0	22.1458		0.00266989	39605.0
Propane	14634.0	14717.4			10.0847			1.88889	30.6874		1.10947		14727.5	10.0457		0.000106150	14419.0
Isobutane	2335.94	2374.91			1.68051			0.370899	6.48234		0.126169		2376.59	1.66456		3.02356E-06	2294.41
n-Butane	3883.44	3979.32			2.83032			0.659532	11.5473		0.260698		3982.15	2.79121		5.62698E-06	3808.92
2,2-Dimethylpropane	0	6.53118			0.00459879			0.000996578	0.0191919		0.000210959		6.53577	0.00452180		1.50682E-09	6.23845
Isopentane	1312.68	1411.29			0.983672			0.224150	4.32088		0.0644069		1412.28	0.953358		3.59449E-07	1329.21
n-Pentane	1074.01	1187.22			0.828680			0.189238	3.70527		0.0212575		1188.05	0.795227		3.49446E-08	1104.64
2,2-Dimethylbutane	0	12.5566			0.00868679			0.00197845	0.0393718		0.000210437		12.5653	0.00812032		1.92794E-10	11.4907
Cyclopentane	0	0			0			0	0		0		0	0		0	0
2,3-Dimethylbutane	0	19.5049			0.0134173			0.00304031	0.0613813		0.000730504		19.5184	0.0122657		1.09952E-09	17.6936
2-Methylpentane	0	124.822			0.0855307			0.0193072	0.393050		0.00302608		124.908	0.0774618		2.73522E-09	113.311
3-Methylpentane	0	83.4954			0.0571661			0.0129162	0.263191		0.00485478		83.5525	0.0512375		9.73320E-09	75.4491
n-Hexane	2921.97	2488.70			1.68805			0.394434	7.83717		0.0295148		2490.39	1.46919		9.37744E-09	2258.66
Methylcyclopentane	0	37.7965			0.0260151			0.00543706	0.120688		0.00358154		37.8225	0.0226992		8.58360E-09	33.4377
Benzene	0	5.89916			0.00408403			0.000646157	0.0190233		0.00490718		5.90324	0.00356662		6.98457E-07	5.18158
Cyclohexane	0	34.8384			0.0237331			0.00498868	0.110396		0.00674411		34.8621	0.0200416		2.63624E-08	31.0756
2-Methylhexane	0	131.362			0.0867457			0.00544113	0.404252		0.00220388		131.449	0.0660152		1.15441E-10	123.463
3-Methylhexane	0	106.375			0.0702058			0.0161497	0.328274		0.00214877		106.445	0.0520544		4.42226E-10	100.337
2,2,4-Trimethylpentane	0	0			0			0	0		0		0	0		0	0
Heptane	0	219.622			0.143327			0.0315918	0.670610		0.00186241		219.765	0.0998475		1.25457E-10	215.017
Methylcyclohexane	0	142.828			0.0947673			0.0212765	0.445170		0.0129285		142.923	0.0651780		9.92503E-09	133.335
Toluene	0	26.9622			0.0180060			0.00300596	0.0848175		0.0205779		26.9802	0.0123083		6.34222E-07	25.2283
Octane	0	314.702			0.197995			0.0427503	0.931466		0.00105865		314.900	0.0843203		8.96278E-12	382.631
Ethylbenzene	0	16.5213			0.0105888			0.00191249	0.0501137		0.0119213		16.5319	0.00442038		1.10005E-07	19.4622
m-Xylene	0	15.4905			0.00989437			0.00231736	0.0467899		0.0101385		15.5004	0.00395985		7.18342E-08	18.6190
o-Xylene	0	21.5835			0.0137785			0.00207240	0.0652915		0.0160682		21.5973	0.00499984		1.45186E-07	26.4912
Nonane	0	87.7423			0.0530585			0.0111620	0.251593		0.000307472		87.7954	0.00999857		7.87870E-13	147.667
C10+	0	9.76847			0.00524121			0.000748178	0.0249775		0.000950064		9.77371	3.52990E-05		1.29047E-12	51.2493

Process Streams		**Gas**	**HP Separator Gas**	**HP Separator Oil**	**HP Separator Water**	**LP Separator Gas**	**LP Separator Oil**	**Oil**	**Oil W/B**	**OT Flash Gas**	**Produced Water**	**PWT Flash Gas**	**Sales Oil**	**Total gas to sale**	**Vapor recovery by VRU (to sale)**	**Water**	**Water W/B**	**Well Stream**
Properties	**Status:**	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Vapor**	**From Block:**	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	2 Phase Separator	2 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	HP Compressor Engine	--	--	MIX-101
	To Block:	MIX-101	MIX-100	2 Phase Separator	PW Tanks	HP Compressor Engine	Condensate Tanks	MIX-101	--	--	--	--	--	--	MIX-100	MIX-101	--	3 Phase Separator
Property	**Units**																	
Temperature	°F	85	70			70			75.9425	75.94		75.94		69.9990	70		75.9425	84.3964
Pressure	psig	1000	169			50			4.46633	0		0		169	169		-14.2224	1000
Mole Fraction Vapor	%	100	100			100			100	100		100		100	100		100	100
Mole Fraction Light Liquid	%	0	0			0			0	0		0		0	0		0	0
Mole Fraction Heavy Liquid	%	0	0			0			0	0		0		0	0		0	0
Molecular Weight	lb/lbmol	19.3425	19.4366			23.3654			39.6915	36.6976		19.7662		19.4377	23.2201		18.4577	19.3886
Mass Density	lb/ft^3	4.11281	0.655023			0.271783			0.134732	0.0949227		0.0507033		0.655066	0.798907		0.00152127	4.13563
Molar Flow	lbmol/h	11486.2	11528.1			3.26446			0.165874	3.15242		0.977239		11531.3	3.24776		0.0103512	11459.0
Mass Flow	lb/h	222172	224066			76.2755			6.58380	115.686		19.3163		224142	75.4135		0.191060	222175
Vapor Volumetric Flow	ft^3/h	54019.5	342073			280.648			48.8660	1218.74		380.968		342167	94.3958		125.592	53722.2
Liquid Volumetric Flow	gpm	6734.90	42648.1			34.9899			6.09239	151.947		47.4973		42659.8	11.7688		15.6583	6697.83
Std Vapor Volumetric Flow	MMSCFD	104.612	104.993			0.0297315			0.00151072	0.0287110		0.00890032		105.023	0.0295794		9.42749E-05	104.364
Std Liquid Volumetric Flow	sgpm	1349.86	1355.14			0.423828			0.0291401	0.517032		0.113913		1355.56	0.421280		0.000424359	1346.80

Compressibility		0.816421	0.958944		0.978494		0.982113	0.988446	0.996719	0.958939	0.939289	0.999551	0.814754
Specific Gravity		0.667845	0.671091		0.806743		1.37044	1.26707	0.682474	0.671130	0.801728	0.637294	0.669437
API Gravity													
Enthalpy	Btu/h	-3.91985E+08	-3.89897E+08		-116874		-7132.07	-133764	-36287.8	-3.90014E+08	-115948	-1052.42	-3.92005E+08
Mass Enthalpy	Btu/lb	-1764.33	-1740.10		-1532.27		-1083.28	-1156.26	-1878.61	-1740.03	-1537.50	-5508.35	-1764.40
Mass Cp	Btu/(lb*°F)	0.660192	0.511229		0.467963		0.410960	0.418384	0.481453	0.511220	0.487417	0.441957	0.660918
Ideal Gas CpCv Ratio		1.26187	1.26477		1.22718		1.14009	1.14965	1.26485	1.26475	1.22848	1.32193	1.26150
Dynamic Viscosity	cP	0.0130540	0.0108593		0.0102270		0.00869259	0.00895784	0.0108463	0.0108592	0.0104363	0.0102820	0.0130570
Kinematic Viscosity	cSt	0.198145	1.03496		2.34912		4.02772	5.89132	13.3543	1.03488	0.815508	421.943	0.197098
Thermal Conductivity	Btu/(h*ft*°F)	0.0226629	0.0181807		0.0161502		0.0111828	0.0122544	0.0174826	0.0181802	0.0166479	0.0122783	0.0226478
Surface Tension	lbf/ft												
Net Ideal Gas Heating Value	Btu/ft^3	1063.82	1066.40		1264.60		2089.59	1930.65	1031.82	1066.45	1259.60	48.9286	1065.32
Net Liquid Heating Value	Btu/lb	20825.3	20771.4		20450.7		19824.7	19818.3	19729.9	20771.3	20499.9	31.1548	20803.5
Gross Ideal Gas Heating Value	Btu/ft^3	1175.17	1177.94		1390.38		2274.24	2104.07	1140.88	1178.00	1384.99	101.254	1176.76
Gross Liquid Heating Value	Btu/lb	23009.8	22949.3		22493.5		21590.1	21611.4	21823.7	22949.1	22549.2	1106.95	22984.8

Process Streams		**Gas**	**HP Separator Gas**	**HP Separator Oil**	**HP Separator Water**	**LP Separator Gas**	**LP Separator Oil**	**Oil**	**Oil W/B**	**OT Flash Gas**	**Produced Water**	**PWT Flash Gas**	**Sales Oil**	**Total gas to sale Vapor recovery by VRU (to sale)**	**Water**	**Water W/B**	**Well Stream**
Composition	**Status:**	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Light Liquid**	**From Block:**	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	2 Phase Separator	2 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	--	--	MIX-101
	To Block:	MIX-101	MIX-100	2 Phase Separator	PW Tanks	HP Compressor Engine	Condensate Tanks	MIX-101	--	--	--	--	--	MIX-100	MIX-101	--	3 Phase Separator
Mole Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water				0.0819432	99.9675		0.0622763	0			99.9967		0.0236428		0.0382382	100	0.0893720
H2S				0	0		0	0			0		0		0	0	0
Nitrogen				0.00957677	7.59467E-05		0.00106467	0.0219998			2.83860E-06		2.83702E-05		0.00302278	0	0.0600113
Carbon Dioxide				0.0284803	0.00103693		0.0155979	0.0139999			0.000639271		0.00312172		0.0446426	0	0.107555
Methane				4.86174	0.0251056		1.38108	4.97995			0.00185697		0.108709		4.26463	0	23.7915
Ethane				4.08912	0.00499389		3.02802	5.23595			0.000531796		1.07979		8.96053	0	12.7256
Propane				3.76359	0.000841849		3.57762	5.28795			6.53563E-05		2.49283		9.26656	0	8.12983
Isobutane				1.15385	7.09225E-05		1.16923	1.72798			3.92940E-06		1.03033		2.87791	0	1.87730
n-Butane				2.80175	0.000149111		2.87690	4.22196			1.06870E-05		2.67603		7.05212	0	4.16869
2,2-Dimethylpropane				0.00470513	9.35328E-08		0.00486302	0.117999			3.29433E-09		0.00465337		0.0111864	0	0.00622192
Isopentane				1.91082	2.90540E-05		1.99647	3.18197			1.50395E-06		2.00214		4.40424	0	2.06637
n-Pentane				2.15424	9.29151E-06		2.25763	3.62196			1.98496E-07		2.29448		4.86030	0	2.20481
2,2-Dimethylbutane				0.0300125	7.68504E-08		0.0315569	0.206998			1.48653E-09		0.0325576		0.0689051	0	0.0274880
Cyclopentane				0	0		0	0			0		0		0	0	0
2,3-Dimethylbutane				0.0629868	2.73288E-07		0.0663263	0.333997			1.16742E-08		0.0688908		0.140089	0	0.0532275
2-Methylpentane				0.447245	1.11628E-06		0.471156	2.17098			3.25480E-08		0.490301		0.981500	0	0.363790
3-Methylpentane				0.333014	1.86780E-06		0.350951	1.47799			1.29187E-07		0.365850		0.721150	0	0.265373
n-Hexane				12.8264	1.07278E-05		13.5278	3.40097			1.57664E-07		14.1519		26.6224	0	9.38377
Methylcyclopentane				0.198920	1.47567E-06		0.209787	0.718993			1.62327E-07		0.219422		0.413010	0	0.154919
Benzene				0.0376073	2.29772E-05		0.0396727	0.124999			2.10447E-05		0.0415461		0.0693990	0	0.0287749
Cyclohexane				0.259870	3.18594E-06		0.274281	0.720993			7.13015E-07		0.287925		0.459795	0	0.181662
2-Methylhexane				1.26217	6.92747E-07		1.33305	2.61697			1.39567E-08		1.40372		2.16868	0	0.757319
3-Methylhexane				1.13750	6.78061E-07		1.20152	2.20698			1.62446E-08		1.26589		1.89886	0	0.672779
2,2,4-Trimethylpentane				0	0		0	0			0		0		0	0	0
Heptane				3.04332	5.79931E-07		3.21538	5.08495			6.31174E-09		3.39149		4.54849	0	1.69584
Methylcyclohexane				2.05002	4.56299E-06		2.16592	3.39797			4.99414E-07		2.28450		3.15895	0	1.20174
Toluene				0.510861	6.32129E-05		0.539822	0.760992			5.63372E-05		0.569765		0.648135	0	0.295079
Octane				12.1959	2.87365E-07		12.8924	12.7579			1.33953E-09		13.6333		10.4315	0	6.09232
Ethylbenzene				0.840327	2.87853E-05		0.888355	0.836992			2.53274E-05		0.939571		0.609033	0	0.432027
m-Xylene				0.855790	1.68450E-05		0.904717	0.835992			1.39020E-05		0.956952		0.585944	0	0.438709
o-Xylene				1.38287	5.54325E-05		1.46197	1.31099			5.07788E-05		1.54655		0.866749	0	0.710422
Nonane				9.56955	7.43415E-08		10.1178	8.14292			3.54200E-10		10.7074		3.51932	0	4.77982
C10+				32.0958	1.92746E-07		33.9369	24.4798			2.90411E-08		35.9267		0.304692	0	17.2377
Molar Flow		lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
Water				0.0493084	3239.16		0.0354410	0			3239.13		0.0127096		3.64786E-06	3263.15	0.0989325
H2S				0	0		0	0			0		0		0	0	0
Nitrogen				0.00576271	0.00246083		0.000605898	0.0174057			9.19488E-05		1.52510E-05		2.88368E-07	0	0.0664309
Carbon Dioxide				0.0171377	0.0335987		0.00887668	0.0110764			0.0207075		0.00167814		4.25882E-06	0	0.119061
Methane				2.92550	0.813474		0.785966	3.94002			0.0601516		0.0584386		0.000406838	0	26.3365
Ethane				2.46058	0.161813		1.72323	4.14256			0.0172261		0.580460		0.000854818	0	14.0870
Propane				2.26470	0.0272777		2.03600	4.18370			0.00211704		1.34007		0.000884013	0	8.99951
Isobutane				0.694316	0.00229804		0.665402	1.36714			0.000127282		0.553873		0.000274547	0	2.07812
n-Butane				1.68592	0.00483152		1.63723	3.34032			0.000346178		1.43855		0.000672760	0	4.61463
2,2-Dimethylpropane				0.00283126	3.03066E-06		0.00276751	0.0933580			1.06711E-07		0.00250151		1.06716E-06	0	0.00688751
Isopentane				1.14981	0.000941412		1.13618	2.51750			4.87165E-05		1.07629		0.000420157	0	2.28741
n-Pentane				1.29629	0.000301064		1.28480	2.86562			6.42974E-06		1.23344		0.000463664	0	2.44067
2,2-Dimethylbutane				0.0180597	2.49011E-06		0.0179589	0.163772			4.81521E-08		0.0175020		6.57342E-06	0	0.0304285
Cyclopentane				0	0		0	0			0		0		0	0	0
2,3-Dimethylbutane				0.0379016	8.85510E-06		0.0377459	0.264251			3.78153E-07		0.0370336		1.33643E-05	0	0.0589215
2-Methylpentane				0.269125	3.61696E-05		0.268132	1.71763			1.05430E-06		0.263571		9.36333E-05	0	0.402706
3-Methylpentane				0.200387	6.05207E-05		0.199724	1.16935			4.18465E-06		0.196670		6.87964E-05	0	0.293761
n-Hexane				7.71817	0.000347604		7.69858	2.69077			5.10709E-06		7.60763		0.00253973	0	10.3876
Methylcyclopentane				0.119698	4.78147E-05		0.119388	0.568851			5.25814E-06		0.117954		3.94004E-05	0	0.171491
Benzene				0.0226298	0.000744509		0.0225775	0.0988962			0.000681686		0.0223339		6.62054E-06	0	0.0318531
Cyclohexane				0.156373	0.000103231		0.156091	0.570433			2.30962E-05		0.154780		4.38636E-05	0	0.201095
2-Methylhexane				0.759496	2.24464E-05		0.758630	2.07049			4.52090E-07		0.754596		0.000206888	0	0.838332
3-Methylhexane				0.684480	2.19706E-05		0.683780	1.74611			5.26201E-07		0.680503		0.000181148	0	0.744749
2,2,4-Trimethylpentane				0	0		0	0			0		0		0	0	0
Heptane				1.83128	1.87910E-05		1.82985	4.02310			2.04452E-07		1.82316		0.000433917	0	1.87725
Methylcyclohexane				1.23358	0.000147850		1.23261	2.68839			1.61772E-05		1.22808		0.000301358	0	1.33029
Toluene				0.307405	0.00204823		0.307209	0.602080			0.00182489		0.306289		6.18309E-05	0	0.326645
Octane				7.33871	9.31124E-06		7.33698	10.0937			4.33903E-08		7.32882		0.000995149	0	6.74404
Ethylbenzene				0.505657	0.000932704		0.505557	0.662209			0.000820414		0.505085		5.81007E-05	0	0.478243
m-Xylene				0.514962	0.000545815		0.514869	0.661418			0.000450317		0.514428		5.58980E-05	0	0.485639
o-Xylene				0.832126	0.00179613		0.831996	1.03722			0.00164478		0.831381		8.26863E-05	0	0.786418
Nonane				5.75837	2.40882E-06		5.75795	6.44249			1.14734E-08		5.75599		0.000335737	0	5.29114
C10+				19.3133	6.24536E-06		19.3133	19.3678			9.40707E-07		19.3131		2.90671E-05	0	19.0817
Mass Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water				0.0127206	99.9626		0.00924408	0			99.9948		0.00337152		0.00896616	100	0.0208726
H2S				0	0		0	0			0		0		0	0	0
Nitrogen				0.00231174	0.000118090		0.000245743	0.00575889			4.41388E-06		6.29094E-06		0.00110215	0	0.0217938
Carbon Dioxide				0.0108005	0.00253299		0.00565605	0.00575738			0.00156164		0.00108750		0.0255719	0	0.0613638
Methane				0.672074	0.0223553		0.182554	0.746536			0.00165359		0.0138046		0.890471	0	4.94797
Ethane				1.05951	0.00833482		0.750203	1.47119			0.000887596		0.257006		3.50688	0	4.96060
Propane				1.43005	0.00206048		1.29984	2.17890			0.000159968		0.870112		5.31841	0	4.64742
Isobutane				0.577891	0.000228804		0.559941	0.938504			1.26771E-05		0.474028		2.17714	0	1.41452
n-Butane				1.40322	0.000481050		1.37774	2.29303			3.44786E-05		1.23118		5.33494	0	3.14106
2,2-Dimethylpropane				0.00292519	3.74568E-07		0.00289091	0.0795539			1.31931E-08		0.00265756		0.0105047	0	0.00581954
Isopentane				1.18796	0.000116352		1.18684	2.14526			6.02301E-06		1.14343		4.13588	0	1.93273
n-Pentane				1.33930	3.72094E-05		1.34209	2.44190			7.94933E-07		1.31039		4.56415	0	2.06222
2,2-Dimethylbutane				0.0222864	3.67593E-07		0.0224067	0.166688			7.11061E-09		0.0222087		0.0772863	0	0.0307087
Cyclopentane				0	0		0	0			0		0		0	0	0
2,3-Dimethylbutane				0.0467721	1.30720E-06		0.0470943	0.268955			5.58417E-08		0.0469928		0.157129	0	0.0594640
2-Methylpentane				0.332111	5.33940E-06		0.334540	1.74821			1.55689E-07		0.334451		1.10088	0	0.406414
3-Methylpentane				0.247286	8.93412E-06		0.249189	1.19017			6.17946E-07		0.249559		0.808865	0	0.296466
n-Hexane				9.52453	5.13136E-05		9.60527	2.73867			7.54163E-07		9.65349		29.8606	0	10.4832
Methylcyclopentane				0.144256	6.89334E-06		0.145473	0.565435			7.58305E-07		0.146174		0.452409	0	0.169021
Benzene				0.0253130	9.96211E-05		0.0255334	0.0912383			9.12452E-05		0.0256882		0.0705566	0	0.0291384
Cyclohexane				0.188457	1.48826E-05		0.190195	0.567007			3.33083E-06		0.191809		0.503657	0	0.198199
2-Methylhexane				1.08980	3.85291E-06		1.10058	2.45036			7.76264E-08		1.11338		2.82839	0	0.983761
3-Methylhexane				0.982163	3.77123E-06		0.991993	2.06647			9.03517E-08		1.00406		2.47650	0	0.873943

2,2,4-Trimethylpentane			0	0		0	0			0	0		0	0		0			
Heptane			2.62772	3.22545E-06		2.65466	4.76121			3.51055E-08	2.69001		5.93213	0		2.20290			
Methylcyclohexane			1.73445	2.48678E-05		1.75224	3.11762			2.72183E-06	1.77553		4.03702	0		1.52966			
Toluene			0.405600	0.000323284		0.409818	0.655203			0.000288129	0.415560		0.777274	0		0.352464			
Octane			12.0044	1.82199E-06		12.1341	13.6178			8.49329E-09	12.3271		15.5092	0		9.02177			
Ethylbenzene			0.768747	0.000169625		0.777084	0.830342			0.000149253	0.789583		0.841570	0		0.594603			
m-Xylene			0.782894	9.92639E-05		0.791397	0.829350			8.19235E-05	0.804189		0.809664	0		0.603799			
o-Xylene			1.26508	0.000326651		1.27885	1.30057			0.000299224	1.29967		1.19768	0		0.977761			
Nonane			10.5760	5.29229E-07		10.6920	9.75909			2.52158E-09	10.8704		5.87491	0		7.94732			
C10+			49.5334	1.91610E-06		50.0803	40.9692			2.88708E-07	50.9331		0.710272	0		40.0230			
Mass Flow	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**
Water			0.888304	58354.3		0.638480	0			58353.8	0.228968		6.57172E-05	58786.5		1.78230			
H2S			0	0		0	0			0	0		0	0		0			
Nitrogen			0.161433	0.0689362		0.0169733	0.487594			0.00257580	0.000427232		8.07816E-06	0		1.86096			
Carbon Dioxide			0.754220	1.47866		0.390658	0.487466			0.911326	0.0738542		0.000187429	0		5.23980			
Methane			46.9322	13.0501		12.6088	63.2077			0.964980	0.937498		0.00652667	0		422.503			
Ethane			73.9874	4.86555		51.8159	124.563			0.517973	17.4539		0.0257036	0		423.581			
Propane			99.8633	1.20283		89.7786	184.483			0.0933523	59.0912		0.0389811	0		396.839			
Isobutane			40.3552	0.133567		38.6747	79.4612			0.00739792	32.1923		0.0159573	0		120.785			
n-Butane			97.9894	0.280818		95.1591	194.147			0.0201206	83.6119		0.0391023	0		268.213			
2,2-Dimethylpropane			0.204272	0.000218658		0.199673	6.73567			7.69906E-06	0.180481		7.69941E-05	0		0.496925			
Isopentane			82.9575	0.0679217		81.9738	181.635			0.00351484	77.6529		0.0303138	0		165.034			
n-Pentane			93.5255	0.0217214		92.6968	206.751			0.000463898	88.9915		0.0334528	0		176.091			
2,2-Dimethylbutane			1.55630	0.000214586		1.54761	14.1131			4.14952E-06	1.50824		0.000566467	0		2.62219			
Cyclopentane			0	0		0	0			0	0		0	0		0			
2,3-Dimethylbutane			3.26618	0.000763091		3.25276	22.7719			3.25875E-05	3.19138		0.00115167	0		5.07758			
2-Methylpentane			23.1919	0.00311693		23.1064	148.017			9.08550E-05	22.7133		0.00806888	0		34.7033			
3-Methylpentane			17.2685	0.00521539		17.2113	100.769			0.000360614	16.9481		0.00592855	0		25.3150			
n-Hexane			665.116	0.0299549		663.428	231.878			0.000440105	655.590		0.218862	0		895.154			
Methylcyclopentane			10.0737	0.00402406		10.0477	47.8742			0.000442523	9.92698		0.00331592	0		14.4326			
Benzene			1.76765	0.0581549		1.76357	7.72496			0.0532478	1.74454		0.000517142	0		2.48810			
Cyclohexane			13.1603	0.00868787		13.1366	48.0074			0.00194376	13.0262		0.00369154	0		16.9241			
2-Methylhexane			76.1030	0.00224918		76.0162	207.467			4.53003E-05	75.6120		0.0207306	0		84.0025			
3-Methylhexane			68.5862	0.00220150		68.5160	174.964			5.27263E-05	68.1878		0.0181514	0		74.6253			
2,2,4-Trimethylpentane			0	0		0	0			0	0		0	0		0			
Heptane			183.498	0.00188289		183.355	403.122			2.04865E-05	182.684		0.0434794	0		188.104			
Methylcyclohexane			121.120	0.0145168		121.025	263.963			0.00158837	120.580		0.0295892	0		130.616			
Toluene			28.3238	0.188721		28.3058	55.4747			0.168143	28.2209		0.00569700	0		30.0966			
Octane			838.290	0.00106361		838.092	1152.99			4.95641E-06	837.161		0.113674	0		770.361			
Ethylbenzene			53.6831	0.0990205		53.6725	70.3034			0.0870992	53.6224		0.00616826	0		50.7726			
m-Xylene			54.6709	0.0579464		54.6610	70.2194			0.0478079	54.6143		0.00593441	0		51.5579			
o-Xylene			88.3426	0.190686		88.3289	110.117			0.174618	88.2636		0.00877839	0		83.4901			
Nonane			738.540	0.00030943		738.487	826.283			1.47152E-06	738.235		0.0430600	0		678.615			
C10+			3459.01	0.00111854		3459.00	3468.78			0.000168481	3458.98		0.00520591	0		3417.53			

Process Streams		**Gas**	**HP Separator Gas**	**HP Separator Oil**	**HP Separator Water**	**LP Separator Gas**	**LP Separator Oil**	**Oil**	**Oil W/B**	**OT Flash Gas**	**Produced Water**	**PWT Flash Gas**	**Sales Oil**	**Total gas to sale Vapor recovery by VRU (to sale)**	**Water**	**Water W/B**	**Well Stream**
Properties	**Status:**	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Light Liquid**	**From Block:**	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	2 Phase Separator	2 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	HP Compressor Engine	--	--	MIX-101
	To Block:	MIX-101	MIX-100	2 Phase Separator	PW Tanks	HP Compressor Engine	Condensate Tanks	MIX-101	--	--	--	--	--	--	MIX-100	MIX-101	--	3 Phase Separator
Property	**Units**																	
Temperature	°F			70	70		70	85			75.94		75.94		70	85		84.3964
Pressure	psig			169	169		50	1000			0		0		169	1000		1000
Mole Fraction Vapor	%			0	0		0	0			0		0		0	0		0
Mole Fraction Light Liquid	%			100	100		100	100			100		100		100	100		100
Mole Fraction Heavy Liquid	%			0	0		0	0			0		0		0	0		0
Molecular Weight	lb/lbmol			116.050	18.0162		121.367	107.015			18.0156		126.332		76.8303	18.0153		77.1374
Mass Density	lb/ft^3			45.6556	62.2671		45.9207	44.8897			62.2225		46.0067		40.6805	62.1852		41.0940
Molar Flow	lbmol/h			60.1738	3240.21		56.9094	79.1177			3239.23		53.7570		0.00953982	3263.15		110.697
Mass Flow	lb/h			6983.19	58376.1		6906.91	8466.80			58356.8		6791.22		0.732947	58786.5		8538.91
Vapor Volumetric Flow	ft^3/h			152.954	937.512		150.409	188.614			937.873		147.614		0.0180171	945.347		207.790
Liquid Volumetric Flow	gpm			19.0695	116.885		18.7523	23.5155			116.930		18.4038		0.00224629	117.861		25.9062
Std Vapor Volumetric Flow	MMSCFD			0.548040	29.5106		0.518309	0.720574			29.5017		0.489598		8.68850E-05	29.7195		1.00819
Std Liquid Volumetric Flow	sgpm			19.3158	116.781		18.8919	23.8565			116.667		18.3749		0.00228960	117.519		26.7387
Compressibility				0.0821453	0.00935049		0.0300815	0.413845			0.000740265		0.00702067		0.0610347	0.0502914		0.326217
Specific Gravity				0.732024	0.998366		0.736275	0.719743			0.997651		0.737652		0.652255	0.997052		0.658885
API Gravity				60.5518	10.0320		59.4779	61.8927			10.0026		58.4513		83.5981	9.87799		78.6717
Enthalpy	Btu/h			-5.92241E+06	-3.98466E+08		-5.79724E+06	-7.23618E+06			-3.98112E+08		-5.62638E+06		-721.824	-4.00371E+08		-8.07262E+06
Mass Enthalpy	Btu/lb			-848.096	-6825.84		-839.339	-854.654			-6822.04		-828.478		-984.824	-6810.58		-945.392
Mass Cp	Btu/(lb*°F)			0.490937	0.982120		0.488552	0.500250			0.981761		0.489902		0.534404	0.979420		0.532998
Ideal Gas CpCv Ratio				1.04772	1.32582		1.04566	1.05070			1.32555		1.04342		1.07193	1.32512		1.06987
Dynamic Viscosity	cP			0.595234	0.995421		0.652592	0.503007			0.924426		0.681257		0.267205	0.840378		0.624151
Kinematic Viscosity	cSt			0.813903	0.997993		0.887181	0.699531			0.927478		0.924421		0.410050	0.843659		0.407362
Thermal Conductivity	Btu/(h*ft*°F)			0.0694420	0.346573		0.0697393	0.0676959			0.349778		0.0697222		0.0670398	0.353848		0.0651259
Surface Tension	lbf/ft			0.00149055	0.00502990?		0.00158072	0.000843943			0.00498763?		0.00160797		0.00108177	0.00492045		0.000696076
Net Ideal Gas Heating Value	Btu/ft^3			5826.30	0.346406		6087.98	5383.32			0.0352218		6331.77		3919.11	0		3916.22
Net Liquid Heating Value	Btu/lb			18888.6	-1052.09		18871.3	18916.9			-1058.97		18855.2		19179.2	-1059.76		19110.1
Gross Ideal Gas Heating Value	Btu/ft^3			6252.42	50.6758		6531.32	5781.79			50.3469		6790.94		4230.79	50.3101		4217.79
Gross Liquid Heating Value	Btu/lb			20281.3	8.02634		20256.9	20328.5			0.805272		20233.8		20717.1	0		20593.2

Process Streams		**Gas**	**HP Separator Gas**	**HP Separator Oil**	**HP Separator Water**	**LP Separator Gas**	**LP Separator Oil**	**Oil**	**Oil W/B**	**OT Flash Gas**	**Produced Water**	**PWT Flash Gas**	**Sales Oil**	**Total gas to sale Vapor recovery by VRU (to sale)**	**Water**	**Water W/B**	**Well Stream**
Composition	**Status:**	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Heavy Liquid**	**From Block:**	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	2 Phase Separator	2 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	HP Compressor Engine	--	--	MIX-101
	To Block:	MIX-101	MIX-100	2 Phase Separator	PW Tanks	HP Compressor Engine	Condensate Tanks	MIX-101	--	--	--	--	--	--	MIX-100	MIX-101	--	3 Phase Separator
Mole Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water															99.9658			99.8706
H2S															0			0
Nitrogen															2.45261E-05			0.000395542
Carbon Dioxide															0.00155070			0.00362730
Methane															0.0200219			0.108504
Ethane															0.00974129			0.014571
Propane															0.00199882			0.00183787
Isobutane															0.000171168			0.000111099
n-Butane															0.000359709			0.000243165
2,2-Dimethylpropane															2.21377E-07			1.23072E-07
Isopentane															6.70687E-05			3.25211E-05
n-Pentane															2.11715E-05			1.18956E-05
2,2-Dimethylbutane															1.67365E-07			7.80712E-08
Cyclopentane															0			0
2,3-Dimethylbutane															5.77496E-07			2.49396E-07
2-Methylpentane															2.32442E-06			1.10403E-06
3-Methylpentane															3.84511E-06			1.77623E-06
n-Hexane															2.12044E-05			1.00791E-05
Methylcyclopentane															2.98305E-06			1.42592E-06
Benzene															4.71632E-05			2.17190E-05
Cyclohexane															6.19188E-06			2.79629E-06
2-Methylhexane															1.15612E-06			4.69992E-07
3-Methylhexane															1.10198E-06			4.48939E-07
2,2,4-Trimethylpentane															0			0
Heptane															8.74548E-07			4.22525E-07
Methylcyclohexane															6.94651E-06			3.43805E-06

Toluene															9.66254E-05			4.99021E-05
Octane															2.52208E-07			2.15641E-07
Ethylbenzene															2.55381E-05			1.98040E-05
m-Xylene															1.42624E-05			1.22880E-05
o-Xylene															4.25395E-05			3.91615E-05
Nonane															2.73695E-08			4.68441E-08
C10+															2.16529E-09			1.53992E-07
Molar Flow	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**	**lbmol/h**
Water															0.00716005			3254.50
H2S															0			0
Nitrogen															1.75668E-09			0.0128896
Carbon Dioxide															1.11069E-07			0.118203
Methane															1.43407E-06			3.53584
Ethane															6.97720E-07			0.471116
Propane															1.43166E-07			0.0598911
Isobutane															1.22599E-08			0.00362040
n-Butane															2.57642E-08			0.00792405
2,2-Dimethylpropane															1.58561E-11			4.01055E-06
Isopentane															4.80379E-09			0.00105977
n-Pentane															1.51641E-09			0.000387645
2,2-Dimethylbutane															1.19875E-11			2.54412E-06
Cyclopentane															0			0
2,3-Dimethylbutane															4.13632E-11			8.12711E-06
2-Methylpentane															1.66487E-10			3.59771E-05
3-Methylpentane															2.75406E-10			5.79822E-05
n-Hexane															1.51877E-09			0.000328449
Methylcyclopentane															2.13661E-10			4.64668E-05
Benzene															3.37807E-09			0.000707761
Cyclohexane															4.43493E-10			9.11231E-05
2-Methylhexane															8.28071E-11			1.53157E-05
3-Methylhexane															7.89290E-11			1.46296E-05
2,2,4-Trimethylpentane															0			0
Heptane															6.26395E-11			1.37689E-05
Methylcyclohexane															4.97544E-10			0.000112036
Toluene															6.92079E-09			0.00162617
Octane															1.80644E-11			7.02714E-06
Ethylbenzene															1.82917E-09			0.000645357
m-Xylene															1.02155E-09			0.000400432
o-Xylene															3.04689E-09			0.00127616
Nonane															1.96034E-12			1.52652E-06
C10+															1.55089E-13			5.01816E-06
Mass Fraction	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Water															99.9537			99.8631
H2S															0			0
Nitrogen															3.81330E-05			0.000615013
Carbon Dioxide															0.00378773			0.00886045
Methane															0.0178272			0.0966147
Ethane															0.0162571			0.0241283
Propane															0.00489188			0.00449819
Isobutane															0.000552168			0.000358408
n-Butane															0.00116038			0.000784456
2,2-Dimethylpropane															8.86477E-07			4.92848E-07
Isopentane															0.000268569			0.000130233
n-Pentane															8.47789E-05			4.76388E-05
2,2-Dimethylbutane															8.00488E-07			3.73422E-07
Cyclopentane															0			0
2,3-Dimethylbutane															2.76210E-06			1.19289E-06
2-Methylpentane															1.11174E-05			5.28067E-06
3-Methylpentane															1.83907E-05			8.49587E-06
n-Hexane															0.000101418			4.82092E-05
Methylcyclopentane															1.39338E-05			6.66078E-06
Benzene															0.000204469			9.41636E-05
Cyclohexane															2.89223E-05			1.30620E-05
2-Methylhexane															6.42963E-06			2.61392E-06
3-Methylhexane															6.12851E-06			2.49683E-06
2,2,4-Trimethylpentane															0			0
Heptane															4.86370E-06			2.34993E-06
Methylcyclohexane															3.78550E-05			1.87365E-05
Toluene															0.000494127			0.000255203
Octane															1.59897E-06			1.36720E-06
Ethylbenzene															0.000150479			0.000116697
m-Xylene															8.40391E-05			7.24985E-05
o-Xylene															0.000250657			0.000230764
Nonane															1.94826E-07			3.33469E-07
C10+															2.15238E-08			1.53080E-06
Mass Flow	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**
Water															0.128990			58630.7
H2S															0			0
Nitrogen															4.92106E-08			0.361081
Carbon Dioxide															4.88807E-06			5.20207
Methane															2.30060E-05			56.7236
Ethane															2.09798E-05			14.1660
Propane															6.31298E-06			2.64094
Isobutane															7.12573E-07			0.210425
n-Butane															1.49747E-06			0.460563
2,2-Dimethylpropane															1.14400E-09			0.000289357
Isopentane															3.46588E-07			0.0764612
n-Pentane															1.09407E-07			0.0279681
2,2-Dimethylbutane															1.03303E-09			0.000219240
Cyclopentane															0			0
2,3-Dimethylbutane															3.56449E-09			0.000700356
2-Methylpentane															1.43470E-08			0.00310034
3-Methylpentane															2.37332E-08			0.00498802
n-Hexane															1.30880E-07			0.0283042
Methylcyclopentane															1.79816E-08			0.00391062
Benzene															2.63867E-07			0.0552845
Cyclohexane															3.73242E-08			0.00766887
2-Methylhexane															8.29744E-09			0.00153466
3-Methylhexane															7.90884E-09			0.00146592
2,2,4-Trimethylpentane															0			0
Heptane															6.27660E-09			0.00137967
Methylcyclohexane															4.88518E-08			0.0110004
Toluene															6.37671E-07			0.149832
Octane															2.06347E-09			0.000802700
Ethylbenzene															1.94194E-07			0.0685143
m-Xylene															1.08452E-07			0.0425118
o-Xylene															3.23473E-07			0.135484
Nonane															2.51424E-10			0.000195783
C10+															2.77765E-11			0.000898752

Process Streams		**Gas**	**HP Separator Gas**	**HP Separator Oil**	**HP Separator Water**	**LP Separator Gas**	**LP Separator Oil**	**Oil**	**Oil W/B**	**OT Flash Gas**	**Produced Water**	**PWT Flash Gas**	**Sales Oil**	**Total gas to sale Vapor recovery by VRU (to sale)**	**Water**	**Water W/B**	**Well Stream**
Properties	**Status:**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**

Phase: **Heavy Liquid**	From Block:	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	2 Phase Separator	2 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	HP Compressor Engine	--	--	MIX-101
	To Block:	MIX-101	MIX-100	2 Phase Separator	PW Tanks	HP Compressor Engine	Condensate Tanks	MIX-101	--	--	--	--	--	--	MIX-100	MIX-101	--	3 Phase Separator
Property	**Units**																	
Temperature	°F														70			84.3964
Pressure	psig														169			1000
Mole Fraction Vapor	%														0			0
Mole Fraction Light Liquid	%														0			0
Mole Fraction Heavy Liquid	%														100			100
Molecular Weight	lb/lbmol														18.0175			18.0166
Mass Density	lb/ft^3														62.2671			62.0936
Molar Flow	lbmol/h														0.00716250			3258.72
Mass Flow	lb/h														0.129050			58711.1
Vapor Volumetric Flow	ft^3/h														0.00207252			945.526
Liquid Volumetric Flow	gpm														0.000258393			117.884
Std Vapor Volumetric Flow	MMSCFD														6.52333E-05			29.6791
Std Liquid Volumetric Flow	sgpm														0.000258182			117.693
Compressibility															0.00935116			0.0504252
Specific Gravity															0.998366			0.995585
API Gravity															10.0320			10.0955
Enthalpy	Btu/h														-880.810			-3.99514E+08
Mass Enthalpy	Btu/lb														-6825.34			-6804.74
Mass Cp	Btu/(lb*°F)														0.982130			0.980500
Ideal Gas CpCv Ratio															1.32580			1.32507
Dynamic Viscosity	cP														0.995373			0.837575
Kinematic Viscosity	cSt														0.997945			0.842084
Thermal Conductivity	Btu/(h*ft*°F)														0.346497			0.351690
Surface Tension	lbf/ft														0.005029102			0.004913777
Net Ideal Gas Heating Value	Btu/ft^3														0.417348			1.28312
Net Liquid Heating Value	Btu/lb														-1050.52			-1031.34
Gross Ideal Gas Heating Value	Btu/ft^3														50.7513			51.6642
Gross Liquid Heating Value	Btu/lb														9.61457			29.8384

Process Streams		Gas	HP Separator Gas	HP Separator Oil	HP Separator Water	LP Separator Gas	LP Separator Oil	Oil	Oil W/B	OT Flash Gas	Produced Water	PWT Flash Gas	Sales Oil	Total gas to sale	Vapor recovery by VRU (to sale)	Water	Water W/B	Well Stream
Composition	Status:	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Mixed Liquid**	From Block:	--	3 Phase Separator	3 Phase Separator	3 Phase Separator	2 Phase Separator	2 Phase Separator	--	--	Condensate Tanks	PW Tanks	PW Tanks	Condensate Tanks	MIX-100	HP Compressor Engine	--	--	MIX-101
	To Block:	MIX-101	MIX-100	2 Phase Separator	PW Tanks	HP Compressor Engine	Condensate Tanks	MIX-101	--	--	--	--	--	--	MIX-100	MIX-101	--	3 Phase Separator
Mole Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water															42.8904			96.5924
H2S															0			0
Nitrogen															0.00173703			0.00235413
Carbon Dioxide															0.0261634			0.00704170
Methane															2.44440			0.886575
Ethane															5.12214			0.432065
Propane															5.29361			0.268872
Isobutane															1.64384			0.0617835
n-Butane															4.02810			0.137192
2,2-Dimethylpropane															0.00638937			0.000204532
Isopentane															2.51559			0.0679190
n-Pentane															2.77606			0.0724474
2,2-Dimethylbutane															0.0393564			0.00903156
Cyclopentane															0			0
2,3-Dimethylbutane															0.0800146			0.00174896
2-Methylpentane															0.560602			0.0119529
3-Methylpentane															0.411899			0.00872018
n-Hexane															15.2058			0.308300
Methylcyclopentane															0.235899			0.00509102
Benzene															0.0396587			0.000966365
Cyclohexane															0.262622			0.00597095
2-Methylhexane															1.23868			0.0248811
3-Methylhexane															1.08457			0.0221036
2,2,4-Trimethylpentane															0			0
Heptane															2.59795			0.0557147
Methylcyclohexane															1.80429			0.0394848
Toluene															0.370235			0.00974269
Octane															5.95815			0.200155
Ethylbenzene															0.347871			0.0142128
m-Xylene															0.334678			0.0144250
o-Xylene															0.495077			0.0233778
Nonane															2.01012			0.157034
C10+															0.174030			0.566320
Molar Flow		lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h	lbmol/h
Water															0.00716370			3254.60
H2S															0			0
Nitrogen															2.90124E-07			0.0793205
Carbon Dioxide															4.36989E-06			0.237264
Methane															0.000408272			29.8724
Ethane															0.000855516			14.5581
Propane															0.000884156			9.05940
Isobutane															0.000274559			2.08174
n-Butane															0.000672785			4.62256
2,2-Dimethylpropane															1.06717E-06			0.00689152
Isopentane															0.000420161			2.28847
n-Pentane															0.000463666			2.44105
2,2-Dimethylbutane															6.57344E-06			0.0304311
Cyclopentane															0			0
2,3-Dimethylbutane															1.33643E-05			0.0589296
2-Methylpentane															9.36335E-05			0.402742
3-Methylpentane															6.87966E-05			0.293819
n-Hexane															0.00253973			10.3879
Methylcyclopentane															3.94006E-05			0.171537
Benzene															6.62392E-06			0.0325608
Cyclohexane															4.38640E-05			0.201186
2-Methylhexane															0.000206888			0.838347
3-Methylhexane															0.000181148			0.744763
2,2,4-Trimethylpentane															0			0
Heptane															0.000433918			1.87726
Methylcyclohexane															0.000301359			1.33041
Toluene															6.18378E-05			0.328272
Octane															0.000995149			6.74404
Ethylbenzene															5.81025E-05			0.478888
m-Xylene															5.58990E-05			0.486040
o-Xylene															8.26893E-05			0.787695
Nonane															0.000335737			5.29114
C10+															2.90671E-05			19.0817
Mass Fraction		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Water															14.9718			87.1859
H2S															0			0
Nitrogen															0.000942854			0.00330414
Carbon Dioxide															0.0223106			0.0155269
Methane															0.759827			0.712604
Ethane															2.98430			0.650925
Propane															4.52292			0.594022

Isobutane														1.85128			0.179919
n-Butane														4.53642			0.399514
2,2-Dimethylpropane														0.00893220			0.000739352
Isopentane														3.51674			0.245517
n-Pentane														3.88086			0.261887
2,2-Dimethylbutane														0.0657158			0.00389949
Cyclopentane														0			0
2,3-Dimethylbutane														0.133605			0.00755134
2-Methylpentane														0.936071			0.0516080
3-Methylpentane														0.687772			0.0376505
n-Hexane														25.3901			1.33113
Methylcyclopentane														0.384681			0.0214669
Benzene														0.0600242			0.00378199
Cyclohexane														0.428259			0.0251773
2-Methylhexane														2.40495			0.124913
3-Methylhexane														2.10574			0.110969
2,2,4-Trimethylpentane														0			0
Heptane														5.04403			0.279710
Methylcyclohexane														3.43264			0.194241
Toluene														0.660981			0.0449761
Octane														13.1873			1.14552
Ethylbenzene														0.715601			0.0756002
m-Xylene														0.688462			0.0767292
o-Xylene														1.01842			0.124350
Nonane														4.99537			1.00909
C10+														0.603937			5.08182
Mass Flow	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**	**lb/h**
Water														0.129056			58632.5
H2S														0			0
Nitrogen														8.12737E-06			2.22204
Carbon Dioxide														0.000192317			10.4419
Methane														0.00654968			479.226
Ethane														0.0257245			437.747
Propane														0.0389874			399.480
Isobutane														0.0159580			120.995
n-Butane														0.0391038			268.673
2,2-Dimethylpropane														7.69953E-05			0.497215
Isopentane														0.0303141			165.110
n-Pentane														0.0334529			176.119
2,2-Dimethylbutane														0.000566468			2.62241
Cyclopentane														0			0
2,3-Dimethylbutane														0.00115167			5.07828
2-Methylpentane														0.00806890			34.7064
3-Methylpentane														0.00592857			25.3200
n-Hexane														0.218862			895.182
Methylcyclopentane														0.00331593			14.4365
Benzene														0.000517406			2.54339
Cyclohexane														0.00369157			16.9317
2-Methylhexane														0.0207306			84.0040
3-Methylhexane														0.0181514			74.6267
2,2,4-Trimethylpentane														0			0
Heptane														0.0434794			188.105
Methylcyclohexane														0.0295892			130.627
Toluene														0.00569764			30.2464
Octane														0.113674			770.362
Ethylbenzene														0.00616845			50.8412
m-Xylene														0.00593452			51.6004
o-Xylene														0.00877871			83.6256
Nonane														0.0430600			678.615
C10+														0.00520591			3417.53

Process Streams		**Gas**	**HP Separator Gas**	**HP Separator Oil**	**HP Separator Water**	**LP Separator Gas**	**LP Separator Oil**	**Oil**	**Oil W/B**	**OT Flash Gas**	**Produced Water**	**PWT Flash Gas**	**Sales Oil**	**Total gas to sale**	**Vapor recovery by VRU (to sale)**	**Water**	**Water W/B**	**Well Stream**
Properties	**Status:**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**	**Solved**
Phase: **Mixed Liquid**	**From Block:**	**--**	**3 Phase Separator**	**3 Phase Separator**	**3 Phase Separator**	**2 Phase Separator**	**2 Phase Separator**	**--**	**--**	**Condensate Tanks**	**PW Tanks**	**PW Tanks**	**Condensate Tanks**	**MIX-100**	**HP Compressor Engine**	**--**	**--**	**MIX-101**
	To Block:	**MIX-101**	**MIX-100**	**2 Phase Separator**	**PW Tanks**	**HP Compressor Engine**	**Condensate Tanks**	**MIX-101**	**--**	**--**	**--**	**--**	**--**	**--**	**MIX-100**	**MIX-101**	**--**	**3 Phase Separator**
Property	**Units**																	
Temperature	°F														70			84.3964
Pressure	psig														169			1000
Mole Fraction Vapor	%														0			0
Mole Fraction Light Liquid	%														57.1167			3.28536
Mole Fraction Heavy Liquid	%														42.8833			96.7146
Molecular Weight	lb/lbmol														51.6094			19.9590
Mass Density	lb/ft^3														42.9075			58.3102
Molar Flow	lbmol/h														0.0167023			3369.41
Mass Flow	lb/h														0.861997			67250.0
Vapor Volumetric Flow	ft^3/h														0.0200897			1153.32
Liquid Volumetric Flow	gpm														0.00250469			143.790
Std Vapor Volumetric Flow	MMSCFD														0.000152118			30.6873
Std Liquid Volumetric Flow	sgpm														0.00254778			144.431
Compressibility															0.0388711			0.0594859
Specific Gravity															0.687961			0.934922
API Gravity															72.6510			18.9393
Enthalpy	Btu/h														-1602.63			-4.07586E+08
Mass Enthalpy	Btu/lb														-1859.21			-6060.76
Mass Cp	Btu/(lb*°F)														0.601434			0.923680
Ideal Gas CpCv Ratio															1.10803			1.29024
Dynamic Viscosity	cP														0.342325			0.734983
Kinematic Viscosity	cSt														0.498064			0.786887
Thermal Conductivity	Btu/(h*ft*°F)														0.0958696			0.300060
Surface Tension	lbf/ft														0.00148899?			0.00415388?
Net Ideal Gas Heating Value	Btu/ft^3														2238.65			129.903
Net Liquid Heating Value	Btu/lb														16150.6			1526.08
Gross Ideal Gas Heating Value	Btu/ft^3														2438.26			188.536
Gross Liquid Heating Value	Btu/lb														17616.9			2640.82

November 5, 2014

FESCO, Ltd.
1100 FESCO Avenue - Alice, Texas 78332

For: Antero Resources Appalachian Corp.
1615 Wynkoop Street
Denver, Colorado 80202

Sample: Gaskins No. 1H
First Stage Separator Hydrocarbon Liquid
Sampled @ 174 psig & 75 °F

Date Sampled: 10/14/14 Job Number: 45834.002

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2186-M

COMPONENT	MOL %	LIQ VOL %	WT %
Nitrogen	0.022	0.005	0.006
Carbon Dioxide	0.014	0.005	0.006
Methane	4.980	1.779	0.750
Ethane	5.236	2.952	1.478
Propane	5.288	3.071	2.189
Isobutane	1.728	1.192	0.943
n-Butane	4.222	2.806	2.303
2,2 Dimethylpropane	0.118	0.095	0.080
Isopentane	3.182	2.453	2.155
n-Pentane	3.622	2.768	2.453
2,2 Dimethylbutane	0.207	0.182	0.167
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.334	0.289	0.270
2 Methylpentane	2.171	1.900	1.756
3 Methylpentane	1.478	1.272	1.195
n-Hexane	3.401	2.949	2.751
Heptanes Plus	63.998	76.283	81.498
Totals:	100.000	100.000	100.000

Characteristics of Heptanes Plus:

Specific Gravity	0.7603	(Water=1)
°API Gravity	54.61	@ 60°F
Molecular Weight	135.7	
Vapor Volume	17.79	CF/Gal
Weight	6.33	Lbs/Gal

Characteristics of Total Sample:

Specific Gravity	0.7117	(Water=1)
°API Gravity	67.33	@ 60°F
Molecular Weight	106.5	
Vapor Volume	21.20	CF/Gal
Weight	5.93	Lbs/Gal

Base Conditions: 14.850 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: XG
Processor: XGdjv
Cylinder ID: W-1001

David Dannhaus 361-661-7015

TANKS DATA INPUT REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Carbon Dioxide	0.014	0.005	0.006
Nitrogen	0.022	0.005	0.006
Methane	4.980	1.779	0.750
Ethane	5.236	2.952	1.478
Propane	5.288	3.071	2.189
Isobutane	1.728	1.192	0.943
n-Butane	4.340	2.901	2.383
Isopentane	3.182	2.453	2.155
n-Pentane	3.622	2.768	2.453
Other C-6's	4.190	3.642	3.389
Heptanes	11.349	10.668	10.446
Octanes	16.156	16.097	16.471
Nonanes	8.143	9.394	9.702
Decanes Plus	24.480	37.097	41.155
Benzene	0.125	0.074	0.091
Toluene	0.761	0.537	0.658
E-Benzene	0.837	0.681	0.834
Xylenes	2.148	1.735	2.140
n-Hexane	3.401	2.949	2.751
2,2,4 Trimethylpentane	0.000	0.000	0.000
Totals:	100.000	100.000	100.000

Characteristics of Total Sample:

Specific Gravity	0.7117	(Water=1)
°API Gravity	67.33	@ 60°F
Molecular Weight	106.5	
Vapor Volume	21.20	CF/Gal
Weight	5.93	Lbs/Gal

Characteristics of Decanes (C10) Plus:

Specific Gravity	0.7895	(Water=1)
Molecular Weight	179.1	

Characteristics of Atmospheric Sample:

°API Gravity	60.81	@ 60°F
Reid Vapor Pressure (ASTM D-5191)	6.09	psi

QUALITY CONTROL CHECK			
	Sampling Conditions	Test Samples	
Cylinder Number	------	W-1001*	W-1020
Pressure, PSIG	174	169	167
Temperature, °F	75	70	70

* Sample used for analysis

TOTAL EXTENDED REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Nitrogen	0.022	0.005	0.006
Carbon Dioxide	0.014	0.005	0.006
Methane	4.980	1.779	0.750
Ethane	5.236	2.952	1.478
Propane	5.288	3.071	2.189
Isobutane	1.728	1.192	0.943
n-Butane	4.222	2.806	2.303
2,2 Dimethylpropane	0.118	0.095	0.080
Isopentane	3.182	2.453	2.155
n-Pentane	3.622	2.768	2.453
2,2 Dimethylbutane	0.207	0.182	0.167
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.334	0.289	0.270
2 Methylpentane	2.171	1.900	1.756
3 Methylpentane	1.478	1.272	1.195
n-Hexane	3.401	2.949	2.751
Methylcyclopentane	0.719	0.536	0.568
Benzene	0.125	0.074	0.091
Cyclohexane	0.721	0.517	0.570
2-Methylhexane	2.617	2.565	2.462
3-Methylhexane	2.207	2.135	2.075
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C-7's	1.175	1.111	1.094
n-Heptane	3.910	3.803	3.678
Methylcyclohexane	3.398	2.880	3.132
Toluene	0.761	0.537	0.658
Other C-8's	9.031	9.193	9.343
n-Octane	3.727	4.025	3.996
E-Benzene	0.837	0.681	0.834
M & P Xylenes	0.836	0.684	0.833
O-Xylene	1.311	1.051	1.307
Other C-9's	5.402	6.142	6.401
n-Nonane	2.741	3.252	3.300
Other C-10's	5.326	6.654	7.062
n-decane	1.836	2.375	2.452
Undecanes(11)	4.811	6.168	6.639
Dodecanes(12)	3.141	4.350	4.747
Tridecanes(13)	2.308	3.427	3.792
Tetradecanes(14)	1.592	2.532	2.839
Pentadecanes(15)	1.165	1.986	2.254
Hexadecanes(16)	0.846	1.540	1.762
Heptadecanes(17)	0.634	1.221	1.410
Octadecanes(18)	0.560	1.134	1.318
Nonadecanes(19)	0.448	0.946	1.106
Eicosanes(20)	0.328	0.719	0.845
Heneicosanes(21)	0.269	0.621	0.735
Docosanes(22)	0.225	0.542	0.645
Tricosanes(23)	0.175	0.436	0.522
Tetracosanes(24)	0.146	0.378	0.455
Pentacosanes(25)	0.100	0.269	0.324
Hexacosanes(26)	0.099	0.276	0.334
Heptacosanes(27)	0.089	0.255	0.311
Octacosanes(28)	0.064	0.192	0.235
Nonacosanes(29)	0.061	0.188	0.230
Triacontanes(30)	0.048	0.151	0.186
Hentriacontanes Plus(31+)	0.209	0.737	0.950
Total	100.000	100.000	100.000

October 30, 2014

FESCO, Ltd.
1100 Fesco Avenue - Alice, Texas 78332

For: Antero Resources Appalachian Corp.
1615 Wynkoop Street
Denver, Colorado 80202

Date Sampled: 10/14/14

Date Analyzed: 10/25/14

Sample: Gaskins No. 1H

Job Number: J45834

FLASH LIBERATION OF HYDROCARBON LIQUID		
	First Stage Separator HC Liquid	Stock Tank
Pressure, psig	174	0
Temperature, °F	75	70
Gas Oil Ratio (1)	------	136
Gas Specific Gravity (2)	------	1.226
Separator Volume Factor (3)	1.0823	1.000

STOCK TANK FLUID PROPERTIES	
Shrinkage Recovery Factor (4)	0.9240
Oil API Gravity at 60 °F	60.81
Reid Vapor Pressure, psi (5)	6.09

Quality Control Check			
	Sampling Conditions	Test Samples	
Cylinder No.	------	W-1001*	W-1020
Pressure, psig	174	169	167
Temperature, °F	75	70	70

(1) - Scf of flashed vapor per barrel of stock tank oil
(2) - Air = 1.000
(3) - Separator volume / Stock tank volume
(4) - Fraction of first stage separator liquid
(5) - Absolute pressure at 100 deg F

Analyst: T. G.

* Sample used for flash study

Base Conditions: 14.85 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

David Dannhaus 361-661-7015

October 28, 2014

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

For: Antero Resources Appalachian Corp.
1615 Wynkoop Street
Denver, Colorado 80202

Sample: Gaskins No. 1H
Gas Evolved from Hydrocarbon Liquid Flashed
From 174 psig & 75 °F to 0 psig & 70 °F

Date Sampled: 10/14/14 Job Number: 45834.001

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	0.065	
Carbon Dioxide	0.114	
Methane	33.358	
Ethane	29.183	7.866
Propane	19.082	5.299
Isobutane	3.640	1.201
n-Butane	6.763	2.149
2-2 Dimethylpropane	0.092	0.035
Isopentane	2.212	0.815
n-Pentane	1.818	0.664
Hexanes	1.906	0.792
Heptanes Plus	1.767	0.789
Totals	100.000	19.609

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.585	(Air=1)
Molecular Weight	102.61	
Gross Heating Value	5482	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.226	(Air=1)
Compressibility (Z)	0.9883	
Molecular Weight	35.09	
Gross Heating Value		
Dry Basis	2069	BTU/CF
Saturated Basis	2034	BTU/CF

*Hydrogen Sulfide tested in laboratory by: Stain Tube Method (GPA 2377)
Results: 0.063 Gr/100 CF, 1.0 PPMV or 0.0001 Mol %

Base Conditions: 14.850 PSI & 60 Deg F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: MR
Processor: IM
Cylinder ID: FL-11S

David Dannhaus 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286
TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	0.065		0.052
Carbon Dioxide	0.114		0.143
Methane	33.358		15.252
Ethane	29.183	7.866	25.011
Propane	19.082	5.299	23.982
Isobutane	3.640	1.201	6.030
n-Butane	6.763	2.149	11.204
2,2 Dimethylpropane	0.092	0.035	0.189
Isopentane	2.212	0.815	4.549
n-Pentane	1.818	0.664	3.738
2,2 Dimethylbutane	0.090	0.038	0.221
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.134	0.055	0.329
2 Methylpentane	0.608	0.254	1.493
3 Methylpentane	0.376	0.155	0.924
n-Hexane	0.698	0.289	1.714
Methylcyclopentane	0.073	0.025	0.175
Benzene	0.024	0.007	0.053
Cyclohexane	0.092	0.032	0.221
2-Methylhexane	0.188	0.088	0.537
3-Methylhexane	0.185	0.085	0.528
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.199	0.087	0.563
n-Heptane	0.245	0.114	0.700
Methylcyclohexane	0.199	0.081	0.557
Toluene	0.041	0.014	0.108
Other C8's	0.273	0.128	0.858
n-Octane	0.078	0.040	0.254
Ethylbenzene	0.003	0.001	0.009
M & P Xylenes	0.019	0.007	0.057
O-Xylene	0.003	0.001	0.009
Other C9's	0.088	0.045	0.317
n-Nonane	0.020	0.011	0.073
Other C10's	0.028	0.016	0.113
n-Decane	0.006	0.004	0.024
Undecanes (11)	0.003	0.002	0.013
Totals	100.000	19.609	100.000

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.226	(Air=1)
Compressibility (Z)	0.9883	
Molecular Weight	35.09	
Gross Heating Value		
Dry Basis	2069	BTU/CF
Saturated Basis	2034	BTU/CF

Gas Analytical Labs

Stonewood, West Virginia
8444 Water Street
Stonewood, WV 26301-8006

Report Date: Jul 6, 2017 2:34p

Client:	ANTERO RESOURCES	Date Sampled:	Jun 28, 2017
Client Code:	9569	Analysis Date:	Jul 5, 2017 12:00a
Site:	OXFORD 11E	Collected By:	EY
Field:	190 - RESOURCES	Date Effective:	Jul 1, 2017 12:00a
Meter:	5009	Source Pressure (PSI):	982.0
Source Laboratory	Stonewood, WV	Source Temp (°F):	69
Lab File No:	**516690662**	Field H2O (lb/MMSCFD):	0.0000000000
Cylinder No:	180		
Analysis Status:	good		
Sample Type:	Spot		
Measurement Analyst:	Holly Van Schoick		

Component	Mol %	Liquid Recovery GPM
H2S (H2S)		
Helium (He)	0.0000	
Nitrogen (N2)	0.5000	0.0000
Oxygen (O2)		
CO2 (CO2)	0.1712	0.0000
Methane (C1)	83.3669	0.0000
Ethane (C2)	11.5578	3.0996
Propane (C3)	2.8893	0.7982
I-Butane (IC4)	0.3499	0.1148
N-Butane (NC4)	0.5817	0.1839
I-Pentane (IC5)	0.1584	0.0581
N-Pentane (NC5)	0.1296	0.0471
Hexanes Plus (C6+)	0.2952	0.1292
TOTAL	100.0000	4.4309

Analytical Results at Base Conditions (Real)

BTU/SCF (Dry):	1,179.8325	BTU/ft³
BTU/SCF (Saturated):	1,159.6955	BTU/ft³
PSIA:	14.696	PSI
Temperature (°F):	60.0	°F
Z Factor (Dry):	0.99698	
Z Factor (Saturated):	0.99660	

Analytical Results at Contract Conditions (Real)

BTU/SCF (Dry):	1,182.5704	BTU/ft³
BTU/SCF (Saturated):	1,162.4343	BTU/ft³
PSIA:	14.730	PSI
Temperature (°F):	60.0	°F
Z Factor (Dry):	0.99698	
Z Factor (Saturated):	0.99660	

Calculated Specific Gravities

Ideal Gravity:	0.6686	Real Gravity:	0.6703
Molecular Wt:	19.3633	lb/lbmol	

Methods, standards, and uncertainties based on GPA 2261-13.
Analytical Calculations performed in accordance with GPA 2172-09.

Attachment U
Facility-wide Emissions Summary Sheet(s)

ATTACHMENT U – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

List all sources of emissions in this table. Use extra pages if necessary.

Emission Point ID#	NOx		CO		VOC		SO2		PM10		PM2.5		CH_4		GHG (CO_2e)	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EP-HR001									3.1234	6.5437						
EP-PCV					0.0462	0.2024							0.2713	1.1884	6.7848	29.7175
F001					2.3985	10.5054							2.6202	11.4764	65.5045	286.9096
EP-L001					15.7089	7.5256							0.6244	0.2991	15.6732	7.5085
EP-L002					0.0007	0.0022							0.0390	0.1185	1.0183	3.0974
EP-ENG001-002(emissions per EPN)	0.0625	0.2738	0.4126	1.8073	0.0183	0.0802	0.0004	0.0016	0.0059	0.0257	0.0059	0.0257	0.1423	0.6233	71.6149	313.6731
EP-GPU001, EP-GPU002, EP-GPU003, EP-GPU004, EP-GPU005, EP-GPU006, EP-GPU007 (emissions per EPN)	0.1271	0.5569	0.1068	0.4678	0.0070	0.0306	0.0008	0.0033	0.0097	0.0423	0.0097	0.0423	0.0029	0.0128	152.5644	668.2319
EP-LH001, EP-LH002, EP-LH003, EP-LH004, EP-LH005, EP-LH006, EP-LH007 (emissions per EPN)	0.1695	0.7425	0.1424	0.6237	0.0093	0.0408	0.0010	0.0045	0.0129	0.0564	0.0129	0.0564	0.0039	0.0171	203.4191	890.9758
EP-EC001 -002 (emissions per EPN)	0.8177	3.5815	3.7214	16.2999	0.7455	3.2653	1.02E-05	4.47E-05	0.0061	0.0267	0.0046	0.0200	0.2390	1.0467	199.5464	874.0131
TOTAL	3.8370	16.8061	10.0124	43.8545	17.3515	14.7190	0.0132	0.0578	0.1818	0.7961	0.1787	0.7828	1.4737	3.9669	3050.8984	13300.4318

Annual emissions shall be based on 8760 hours per year of operation for all emission units except emergency generators.

According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above

ATTACHMENT U – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

List all sources of emissions in this table. Use extra pages if necessary.

Emission Point ID#	Formaldehyde		Benzene		Toluene		Ethylbenzene		Xylenes		Hexane		Total HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
EP-HR001														
EP-PCV			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0052	0.0226	0.0052	0.0226
F001			0.0019	0.0085	0.0139	0.0609	0.0176	0.0772	0.0452	0.1981	0.1077	0.4717	0.1864	0.8165
EP-L001			0.0026	0.0012	0.0121	0.0058	0.0077	0.0037	0.0176	0.0084	1.5827	0.7582	1.6227	0.7774
EP-L002			4.33E-06	1.32E-05	3.93E-06	1.19E-05	6.81E-07	2.07E-06	1.34E-06	4.09E-06	5.81E-08	1.77E-07	1.03E-05	3.14E-05
EP-ENG001-002(emissions per EPN)	0.0127	0.0556	0.0010	0.0043	3.45E-04	0.0015	1.53E-05	6.72E-05	1.21E-04	5.28E-04			0.0142	0.0622
EP-GPU001, EP-GPU002, EP-GPU003, EP-GPU004, EP-GPU005, EP-GPU006, EP-GPU007 (emissions per EPN)	9.54E-05	4.18E-04	2.67E-06	1.17E-05	4.32E-06	1.89E-05			0.00E+00	0.00E+00	0.0023	0.0100	0.0024	0.0105
EP-LH001, EP-LH002, EP-LH003, EP-LH004, EP-LH005, EP-LH006, EP-LH007 (emissions per EPN)	1.27E-04	5.57E-04	3.56E-06	1.56E-05	5.76E-06	2.52E-05			0.00E+00	0.00E+00	0.0031	0.0134	0.0032	0.0140
EP-EC001 -002 (emissions per EPN)	1.28E-06	5.58E-06	2.46E-04	1.08E-03	1.08E-03	0.0047	6.39E-04	0.0028	0.0014	0.0062	0.0826	0.3620	0.0860	0.3768
TOTAL	0.0269	0.1179	0.0051	0.0122	0.0150	0.0186	0.0090	0.0094	0.0207	0.0220	1.7854	1.6459	1.8622	1.8267

Annual emissions shall be based on 8760 hours per year of operation for all emission units except emergency generators.

According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, fugitive emissions shall not be included in the PTE above

Attachment V
Class I Legal Advertisement

Attachment V

Air Quality Permit Notice
Notice of Application
Oxford 13 Well Pad
Antero Resources Corporation
Doddridge County, West Virginia

Notice is given that Antero Resources Corporation has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a G70-D General Permit Modification for an Oil and Natural Gas Production facility located at approximately 0.9 mile south of Cain Run Rd and Co. Rte 54/1 intersection, in Doddridge County, West Virginia.

The latitude and longitude coordinates are: 39.16876 and -80.74779

The applicant estimates the increased potential to discharge the following Regulated Air Pollutants will be:

Pollutants	TOTALS (tpy):
NO_X	16.8061
CO	43.8545
$PM_{2.5}$	0.7828
PM_{10}	0.7961
VOC	14.7190
SO_2	0.0578
CO_{2e}	13,300.43
Formaldehyde	0.1179
Benzene	0.0122
Toluene	0.0186
Ethylbenzene	0.0094
Xylenes	0.0220
Hexane	1.6459
Total HAPs	1.8267

Proposed new equipment will be installed by January 1, 2019 and the facility is expected to begin the operations by April 01, 2019. 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 1250, during normal business hours.
Dated this the __ day of _____, 2017

By: Antero Resources Corporation
Barry Schatz
Senior Environmental & Regulatory Manager
1615 Wynkoop Street
Denver, CO 80202

www.ghd.com