PROJECT REPORT

CNX Gas Company LLC
Pennsboro 1 Wellpad

G70-D Permit Application

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CNX Gas Company LLC (CNX) is submitting this Class II General Permit (G70-D) application to the West Virginia Department of Environmental Protection (WVDEP) to remove the flash gas compressor (Caterpillar G3304NA) from its existing natural gas production wellpad, Pennsboro 1 (PEN1), located in Ritchie County, West Virginia. Additionally, CNX is proposing to install one (1) 30 bbl drip tank and modify the heat input duty rating of the existing NOV flare at the wellpad. The PEN1 pad is currently operating under General Permit G70-A026C.

1.1. FACILITY AND PROJECT DESCRIPTION

The PEN1 pad is a natural gas production facility that currently consists of nine (9) natural gas wells. Natural gas and liquids (including water and condensate) are extracted from deposits underneath the surface. The liquids produced are stored in storage vessels.

The PEN1 pad is currently permitted for the following equipment:

- Four (4) 400 barrel (bbl) condensate storage tanks controlled by two (2) existing LEED vapor combustor units, each with a maximum capacity of 10.4 MMBtu/hr;
- Four (4) 400 barrel (bbl) produced water storage tanks controlled by the aforementioned combustor units;
- One (1) 95 hp Caterpillar G3304NA natural gas fired flash gas compressor engine;
- Nine (9) natural gas fired gas processing units, each rated at 1.0 MMBtu/hr (heat input);
- One (1) low pressure separator with its respective heater rated at 0.75 MMbtu/hr (heat input);
- One (1) thermoelectric generator;
- One (1) produced gas flare with a max capacity of 19.7 MMbtu/hr;
- Condensate truck loading;
- Produced water truck loading; and
- Associated piping and components.

With this application, CNX proposes to:

- Remove the existing Caterpillar G3304NA natural gas fired compressor engine (3S-ENG1) from the facility. The flash gas from the low pressure separator (LPS) will be routed to the flare (10S-COMB) for control.
- Modify the existing LEED vapor destruction unit's (8S-COMB1) maximum design heat input (MDHI) rating from 10.4 MMBtu/hr to 8.69 MMBtu/hr. Updated vendor specification sheets are submitted herein.
- Install one (1) 30 barrel (bbl) drip fluid tank (13S-TK9) that will be controlled by the existing vapor destruction unit (8S-COMB).
- Modify the existing flare's (10S-COMB) maximum design heat input (MDHI) rating from 19.7 MMBtu/hr (based on 1,200 BTU/SCF gas from LPS) to 26.2 MMBtu/hr (based on 1,600 BTU/SCF gas from LPS).
- Remove the existing LEED vapor combustor unit (8S-COMB2) from the current permit.

A process flow diagram is included as Attachment D. A comparison of the potential emissions of the proposed and existing equipment at the wellpad in comparison with G70-D emission limits is provided in Table 1. Facility emissions are well below the permit limits. Note that in accordance with condition 1.1.1. of the G70-D permit, fugitive emissions are not considered in determining eligibility of the permit.

Table 1 - Comparison of Wellpad Potential Emissions to G70-D Permit Emission Limits

Pollutant	Wellpad Potential Annual Emissions (tpy)	G70-D Maximum Annual Emission Limits (tpy)
Nitrogen Oxides	15.00	50
Carbon Monoxide	41.70	80
Volatile Organic Compounds	18.57	80
Particulate Matter – 10/2.5	0.55	20
Sulfur Dioxide	0.04	20
Individual HAP (n-hexane)[1]	0.38	8
Total HAP[1]	1.28	20

1. Includes fugitive emissions

1.2. SOURCE STATUS

WVDEP must make stationary source determinations on a case-by-case basis using the guidance under the Clean Air Act (CAA), EPA and WVDEP's implementing regulations. The definition of stationary source in 40 CFR 51.166(b) includes the following:

> *"(6) Building, structure, facility, or installation means all of the pollutant emitting activities which belong to the same industrial grouping, are located on or more contiguous or adjacent properties, and are under control of the same person (or persons under common control)."*

Other additional pollutant emitting facilities should be aggregated with the PEN1 Pad for air permitting purposes if, and only if, all three elements of the "stationary source" definition above are fulfilled.

WVDEP determined that the PEN1 pad is a separate stationary source when the current permit was issued. Upon transfer of ownership of the PEN1 Pad from Noble Energy to CNX, and with the proposed modifications submitted herein, CNX Gas Company LLC believes the PEN1 Pad continues to be a separate stationary source for purposes of permitting. In addition, as it relates to stationary source determinations, CNX would like to acknowledge as part of this application that a third-party gathering contractor to CNX proposes to install a liquid (H2O) knockout vessel and storage tank (H2O) at the sales transfer line on the wellpad as a precautionary measure to prevent potential liquid (H2O) entrainment into the sales line or gathering system in the event CNX GPU's fail or malfunction.

The PEN1 wellpad and proposed third party equipment are considered separate stationary sources with respect to permitting programs, including Title V and Prevention of Significant Deterioration (PSD). Both CNX and the third-party believe such equipment to be exempt from permitting requirements given any water that could potentially accumulate in the liquid knockout and /or the proposed tank as a result of the knockout dumping liquid does not introduce additional water volume or emissions than that produced by the CNX wells or CNX tank battery. CNX gas as part of this application presents potential emissions from the CNX tank battery based on the maximum potential water make from all wells at the facility. As discussed in this application, the facility is a minor source of air emissions with respect to New Source Review (NSR) and Title V permitting.

1.3. G70-D APPLICATION ORGANIZATION

This West Virginia Code of State Regulations, Title 45 (CSR) Series 13 (45 CSR 13) G70-D permit application is organized as follows:

- Section 2: Sample Emission Source Calculations;
- Section 3: Regulatory Discussion;
- Section 4: G70-D Application Form;
- Attachment A: Single Source Determination;
- Attachment B: Siting Criteria Waiver **(Not Applicable)**;
- Attachment C: Business Certificate;
- Attachment D: Process Flow Diagram;
- Attachment E: Process Description;
- Attachment F: Plot Plan;
- Attachment G: Area Map;
- Attachment H: G70-D Section Applicability Form;
- Attachment I: Emission Units Table;
- Attachment J: Fugitive Emissions Summary Sheet;
- Attachment K: Gas Well Data Sheet;
- Attachment L: Storage Vessel Data Sheet;
- Attachment M: Heaters Data Sheet;
- Attachment N: Engines Data Sheet **(Not Applicable)**;
- Attachment O: Truck Loading Data Sheet;
- Attachment P: Glycol Dehydrator Data Sheet **(Not Applicable)**;
- Attachment Q: Pneumatic Controller Data Sheet
- Attachment R: Pneumatic Pump Data Sheet
- Attachment S: Air Pollution Control Device Data Sheet;
- Attachment T: Emission Calculations;
- Attachment U: Emission Summary Sheet;
- Attachment V: Class I Legal Advertisement; and
- Attachment W: General Permit Registration Application Fee.

The characteristics of the air emissions from the natural gas production operations, along with the methodology for calculating these emissions, are briefly described in this section of the application. Detailed emission calculations are presented in Attachment S of this application.

Emissions from this project will result from liquefied petroleum gas combustion in the thermoelectric generator, natural gas combustion in the heaters, enclosed combustors, as well as storage of organic liquids in storage tanks and loading of organic liquids into tank trucks. In addition, fugitive emissions will result from component leaks from the operation of the production facility. The method by which emissions from each of these source types, as well as the existing source types, are calculated is summarized below.

- **Heaters and Enclosed Combustors:** Potential emissions of criteria pollutants and hazardous air pollutants (HAPs) are calculated using U.S. EPA's AP-42 factors for natural gas external combustion.[1] These calculations assume a site-specific heat content of natural gas. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.[2]

- **Thermoelectric Generator:** Potential emissions of criteria pollutants, hazardous air pollutants (HAPs), and greenhouse gas emissions are calculated using U.S. EPA's AP-42 factors for liquefied petroleum gas (propane) combustion.[3] These calculations assume a site-specific fuel consumption of 1.4 gallon/day.

- **Fugitive Equipment Leaks:** Emissions of VOC and HAPs from leaking equipment components have been estimated using facility estimated component counts and types along with emission factors from the *Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995.* Emission factors are based on average measured TOC from component types indicated. Greenhouse gas emissions from component leaks are calculated according to the procedures in 40 CFR 98 Subpart W.[4] Pneumatic devices at the wellpad are intermittent bleed and are assumed to be in operation 1/3 of the year.

- **Storage Tanks:** Working, breathing and flashing emissions of VOC and HAPs from the storage tanks at the facility are calculated using Bryan Research & Engineering ProMax® Software. Controlled calculations assume an overall control efficiency (capture and destruction) of 98%. The throughput for the produced fluids tanks are based current permit limits at the PEN1 well pad. The composition for the analysis was from a sample taken at SHL-3 (a pad with similar operations to PEN1). The produced fluids throughput is calculated as follows:

$$Throughput\ \left(\frac{bbl}{day}\right) = \left(Condensate\ Throughput\ \left(\frac{bbl}{month}\right) + \left(Produced\ Water\ Throughput\ \left(\frac{bbl}{month}\right)\right)\right) * \frac{12\left(\frac{months}{year}\right)}{365\left(\frac{days}{year}\right)}$$

- **Tank Truck Loading:** Uncontrolled emissions of VOC and HAPs from the loading of organic liquids from storage tanks to tank truck are calculated using Bryan Research Engineering ProMax® Software. Truck loading is controlled by the enclosed combustors. U.S. EPA's AP-42 Chapter 5 Section 2 factors were used for capture efficiency.[5]

[1] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 1.4, Natural Gas Combustion, Supplement D, July 1998.
[2] 40 CFR 98 Subpart C, *General Stationary Fuel combustion Sources*, Tables C-1 and C-2.
[3] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 1.5, Liquefied Petroleum Gas Combustion, July 2008.
[4] 40 CFR 98 Subpart W, *Petroleum and Natural Gas Systems*, Section 98.233(r), *Population Count and Emission Factors*.
[5] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 5.2, Transportation and Marketing of Petroleum Liquids, July 2008.

- **Haul Roads:** Fugitive dust emitted from facility roadways has been estimated using projected vehicle miles traveled along with U.S. EPA's AP-42 factors for unpaved haul roads.[4]

[4] U.S. EPA, AP 42, Fifth Edition, Volume I, Section 13.2.2, Unpaved Roads, November 2006.

This section documents the applicability determinations made for Federal and State air quality regulations. In this section, applicability or non-applicability of the following regulatory programs is addressed:

- Prevention of Significant Deterioration permitting;
- Title V of the 1990 Clean Air Act Amendments;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAP); and
- West Virginia State Implementation Plan (SIP) regulations.

This review is presented to supplement and/or add clarification to the information provided in the WVDEP G70-D permit application forms.

In addition to providing a summary of applicable requirements, this section of the application also provides non-applicability determinations for certain regulations, allowing the WVDEP to confirm that identified regulations are not applicable to the wellpad. Note that explanations of non-applicability are limited to those regulations for which there may be some question of applicability specific to the operations at the wellpad. Regulations that are categorically non-applicable are not discussed (e.g., NSPS Subpart J, Standards of Performance for Petroleum Refineries).

3.1. PREVENTION OF SIGNIFICANT DETERIORATION SOURCE CLASSIFICATION

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration. PSD regulations apply when a major source makes a change, such as installing new equipment or modifying existing equipment, and a significant increase in emissions results from the change. The wellpad is not a major source with respect to the PSD program since its potential emissions are below all the PSD thresholds. As such, PSD permitting is not triggered by this construction activity. CNX will monitor future construction activities at the site closely and will compare any future increase in emissions with the PSD thresholds to ensure these activities will not trigger this program.

3.2. TITLE V OPERATING PERMIT PROGRAM

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in West Virginia CSR 45-30. The major source thresholds with respect to the West Virginia Title V operating permit program regulations are 10 tons per year (tpy) of a single HAP, 25 tpy of any combination of HAP and 100 tpy of all other regulated pollutants. The potential emissions of all regulated pollutants are below the corresponding threshold(s) at this facility after the proposed project. Therefore, the wellpad is not a major source for Title V purposes.

3.3. NEW SOURCE PERFORMANCE STANDARDS

New Source Performance Standards, located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except where expressly noted. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the wellpad. The following NSPS could potentially apply to the wellpad:

- 40 CFR Part 60 Subparts D/Da/Db/Dc – Steam Generating Units
- 40 CFR Part 60 Subpart K/Ka/Kb – Storage Vessels for Petroleum Liquids/Volatile Organic Liquids
- 40 CFR Part 60 Subpart JJJJ – Stationary Spark Ignition Internal Combustion Engines

- 40 CFR Part 60 Subpart OOOO – Crude Oil and Natural Gas Production, Transmission, and Distribution
- 40 CFR Part 60 Subpart OOOOa – Crude Oil and Natural Gas Facilities

3.3.1. NSPS Subparts D, Da, Db, and Dc – Steam Generating Units

These subparts apply to steam generating units of various sizes, all greater than 10 MMBtu/hr. The proposed project does not include any steam generating units with a heat input greater than 10 MMbtu/hr, therefore the requirements of these subparts do not apply.

3.3.2. NSPS Subparts K, Ka, and Kb – Storage Vessels for Petroleum Liquids/Volatile Organic Liquids

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka applies to those constructed, reconstructed, or modified prior to 1984. Both Subparts K and Ka apply to storage tanks with a capacity greater than 40,000 gallons. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m^3 (~19,813 gallons). All of the tanks at the wellpad have a capacity of 19,813 gallons or less. As such, Subparts K, Ka, and Kb do not apply to the storage tanks at the wellpad.

3.3.3. NSPS Subparts JJJJ – Stationary Spark Ignition Internal Combustion Engines

New Source Performance Standards 40 CFR Part 60 Subpart JJJJ (NSPS JJJJ) affects owners and operators of stationary spark ignition internal combustion engines (SI ICE) that commence construction, reconstruction or modification after June 12, 2006. Applicability dates are based on the date the engine was ordered by the operator. CNX is proposing to remove the existing engine at the pad. As such, Subpart JJJJ will not apply to the PEN1 wellpad.

3.3.4. NSPS Subpart OOOO - Crude Oil and Natural Gas Production, Transmission, and Distribution

Subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, applies to affected facilities that commenced construction, reconstruction, or modification after August 23, 2011 and or before September 18, 2015. This NSPS was published in the Federal Register on August 16, 2012, and subsequently amended. The proposed project does not change applicability dates with respect to NSPS Subpart OOOO for existing equipment. Therefore, this subpart is not applicable to the proposed project. Note that EPA recently finalized 40 CFR 60 Subpart OOOOa; applicability of Subpart OOOOa is discussed in the following section.

3.3.5. NSPS Subpart OOOOa—Crude Oil and Natural Gas Facilities

Subpart OOOOa, Standards of Standards of Performance for Crude Oil and Natural Gas Facilities, applies to affected facilities that commenced construction, reconstruction, or modification after September 18, 2015. The regulation was published final in the Federal Register on June 3, 2016. The rule includes provisions for the following facilities:

- Hydraulically fractured wells;
- Centrifugal compressors located between the wellhead and the point of custody transfer to the natural gas distribution segment;
- Reciprocating compressors located between the wellhead and the point of custody transfer to the natural gas distribution segment;
- Continuous bleed natural gas-driven pneumatic controllers with a bleed rate of > 6 scfh located in the production, gathering, processing, or transmission and storage segments (excluding natural gas processing plants);
- Continuous bleed natural gas-driven pneumatic controllers located at natural gas processing plants;
- Pneumatic pumps located in the production and processing segments;

- Storage vessels located in the production, gathering, processing, or transmission and storage segments;
- The collection of fugitive emissions components at a well site;
- The collection of fugitive emissions components at a compressor station; and
- Sweetening units located onshore that process natural gas produced from either onshore or offshore wells.

Based on the rule, the following paragraphs describe the applicability of the facilities to be located at the PEN1 wellpad.

There are nine (9) storage vessels (four (4) condensate, four (4) produced water and drip fluid tank) at the wellpad. The storage vessels at the facility will each have potential VOC emissions less than 6 tpy based on the permit application materials and enforceable limits to be included in the G70-D permit. As such, per 60.5365a(e), the tanks will not be storage vessel affected facilities under the rule.

Note that the proposed changes to the well pad do not meet the definition of modification under 60.5365a(i)(3)(i). Therefore, CNX will be not be subject to the leak detection and repair program under OOOOa.

Per 60.5365a(d)(1), a pneumatic controller affected facility is a single continuous bleed natural gas driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh. Per 60.5365a(h)(1), a pneumatic pump for well sites is defined as a single natural gas-driven diaphragm pump. PEN1 does not have any pneumatic controller or pneumatic pump that meet these definitions, therefore the requirements for these equipment do not apply.

3.3.6. Non-Applicability of All Other NSPS

NSPS are developed for particular industrial source categories. Other than NSPS developed for natural gas processing plants (Subparts OOOO) and associated equipment (Subparts D-Dc and K-Kb), the applicability of a particular NSPS to the wellpad can be readily ascertained based on the industrial source category covered. All other NSPS are categorically not applicable to the proposed project.

3.4. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Part 63 NESHAP allowable emission limits are established on the basis of a maximum achievable control technology (MACT) determination for a particular major source. A HAP major source is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. The wellpad is an Area (minor) source of HAP since its potential emissions of HAP are less than the 10/25 major source thresholds. NESHAP apply to sources in specifically regulated industrial source categories (Clean Air Act Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type. Besides 40 CFR 63 Subpart A (NESHAP Subpart A), which is similar to 40 CFR 60 Subpart A (NSPS Subpart A), the following NESHAP could potentially apply to the wellpad:

- 40 CFR Part 63 Subpart HH – Oil and Natural Gas Production Facilities
- 40 CFR Part 63 Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines
- 40 CFR Part 63 Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers

The applicability of these NESHAP Subparts is discussed in the following sections.

3.4.1. 40 CFR 63 Subpart HH – Oil and Natural Gas Production Facilities

This standard contains requirements for both major and area sources of HAP. At area sources, the only affected source is a triethylene glycol dehydration unit (§63.760(b)(2)). The wellpad does not include a triethylene glycol dehydration unit; therefore the requirements of this subpart do not apply.

3.4.2. 40 CFR 63 Subpart ZZZZ – Stationary Reciprocating Internal Engines

This rule affects reciprocating internal combustion engines (RICE) located at a major and area sources of HAP. Stationary RICE at facilities that are area sources of HAP are considered existing if they commenced construction before June 12, 2006. CNX is proposing to remove the existing engine at the pad. As such, Subpart ZZZZ does not apply to the PEN1 wellpad.

3.4.3. 40 CFR 63 Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers

This MACT standard applies to industrial, commercial, and institutional boilers of various sizes and fuel types at area sources. The line heaters are natural gas-fired and are specifically exempt from this subpart. Therefore, no sources at the wellpad are subject to any requirements under 40 CFR 63 Subpart JJJJJJ.

3.5. WEST VIRGINIA SIP REGULATIONS

The wellpad is potentially subject to regulations contained in the West Virginia Code of State Regulations, Chapter 45 (Code of State Regulations). The Code of State Regulations fall under two main categories, those regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., PM standards for manufacturing equipment).

3.5.1. 45 CSR 2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

45 CSR 2 applies to fuel burning units, defined as equipment burning fuel "for the primary purpose of producing heat or power by indirect heat transfer". The gas processing units and thermoelectric generator are fuel burning units and therefore must comply with this regulation. Per 45 CSR 2-3, opacity of emissions from units shall not exceed 10 percent.

3.5.2. 45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

According to 45 CSR 4-3:

No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

The wellpad is generally subject to this requirement. However, due to the nature of the process at the wellpad, production of objectionable odor from the wellpad during normal operation is unlikely.

3.5.3. 45 CSR 6: Control of Air Pollution from the Combustion of Refuse

45 CSR 6 applies to activities involving incineration of refuse, defined as "the destruction of combustible refuse by burning in a furnace designed for that purpose. For the purposes of this rule, the destruction of any combustible liquid or gaseous material by burning in a flare or flare stack, thermal oxidizer or thermal catalytic oxidizer stack shall be considered incineration." The enclosed combustors are incinerators and therefore must comply with this regulation. Per 45 CSR 6-4.3, opacity of emissions from this unit shall not exceed 20 percent, except as provided by 4.4. PM emissions from this unit will not exceed the levels calculated in accordance with 6-4.1.

3.5.4. 45 CSR 16: Standards of Performance for New Stationary Sources

45 CSR 16-1 incorporates the federal Clean Air Act (CAA) standards of performance for new stationary sources set forth in 40 CPR Part 60 by reference. As such, by complying with all applicable requirements of 40 CFR Part 60 at the wellpad, CNX will be complying with 45 CSR 16.

3.5.5. 45 CSR 17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

According to 45 CSR 17-3.1:

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

Due to the nature of the activities at the wellpad, it is unlikely that fugitive particulate matter emissions will be emitted under normal operating conditions. However, CNX will take measures to ensure any fugitive particulate matter emissions will not cross the property boundary should any such emissions occur.

3.5.6. 45 CSR 21-28: Petroleum Liquid Storage in Fixed Roof Tanks

45 CSR 21-28 applies to any fixed roof petroleum liquid storage tank with a capacity greater than 40,000 gallons. The capacity of each storage tank proposed for the wellpad is less than 40,000 gallons; therefore, 45 CSR 21-28 will not apply to the petroleum liquid storage tanks at this wellpad.

3.5.7. 45 CSR 34: Emissions Standards for Hazardous Air Pollutants

45 CSR 34-1 incorporates the federal Clean Air Act (CAA) national emissions standards for hazardous air pollutants (NESHAPs) as set forth in 40 CPR Parts 61 and 63 by reference. As such, by complying with all applicable requirements of 40 CFR Parts 61 and 63 at the wellpad, CNX will be complying with 45 CSR 34. Note that there are no applicable requirements under 40 CFR Parts 61 and 63 for the wellpad.

3.5.8. Non-Applicability of Other SIP Rules

A thorough examination of the West Virginia SIP rules with respect to applicability at the wellpad reveals many SIP regulations that do not apply or impose additional requirements on operations. Such SIP rules include those specific to a particular type of industrial operation that is categorically not applicable to the wellpad.

4. G70-D APPLICATION FORMS

The WVDEP permit application forms contained in this application include all applicable G70-D application forms including the required attachments.

west virginia department of environmental protection

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Charleston, WV 25 4
Phone (304) 926-0475
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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): CNX Gas Company LLC

Federal Employer ID No. (FEIN): 550738862

Applicant's Mailing Address: 1000 CONSOL Energy Drive

City: Canonsburg	State: PA	ZIP Code: 15317

Facility Name: Pennsboro 1 (PEN1) Production Facility

Operating Site Physical Address:
If none available, list road, city or town and zip of facility.

City: Pennsboro	Zip Code:	County: Ritchie

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.33494°
Longitude: -80.99283°

SIC Code: 1311 NAICS Code: 211111	DAQ Facility ID No. (For existing facilities) 085-00035

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 _Craig Neal_ 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: Craig Neal

Name and Title: Craig Neal, VP Gas Operations
Email: CraigNeal@consolenergy.com
Phone: (724) 485-4000
Fax:
Date:

If applicable:
Authorized Representative Signature: _____

Name and Title:
Email:
Phone:
Fax:
Date:

If applicable:
Environmental Contact

Name and Title: Patrick Flynn, Air Quality Engineer
Email: PatrickFlynn@consolenergy.com
Phone: (724) 485-3156
Fax:
Date:

OPERATING SITE INFORMATION
Briefly describe the proposed new operation and/or any change(s) to the facility: CNX Gas Company LLC (CNX) is proposing to remove the current vapor recovery unit/flash compressor, which is currently oversized. Additionally, CNX is proposing to install one (1) 30 bbl drip fluid tank and modify the heat input duty rating of the existing NOV Flare at the wellpad from 19.7 to 26.2 MMbtu/hr.
Directions to the facility: From Pennsboro, WV, take Hwy WV-74 N/Mountain Dr. north for approximately 3 miles, then turn left (east) onto County Road 6/Bonds Creek Rd. Go approximately 2.2 miles to the Pennsboro 1 Production Facility entrance on the right (north).

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)** – 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/Rail Car 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	

All attachments must be identified by name, divided into sections, and submitted in order.

ATTACHMENT A

Single Source Determination

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 ☐

ATTACHMENT A: SINGLE SOURCE DETERMINATION MAP

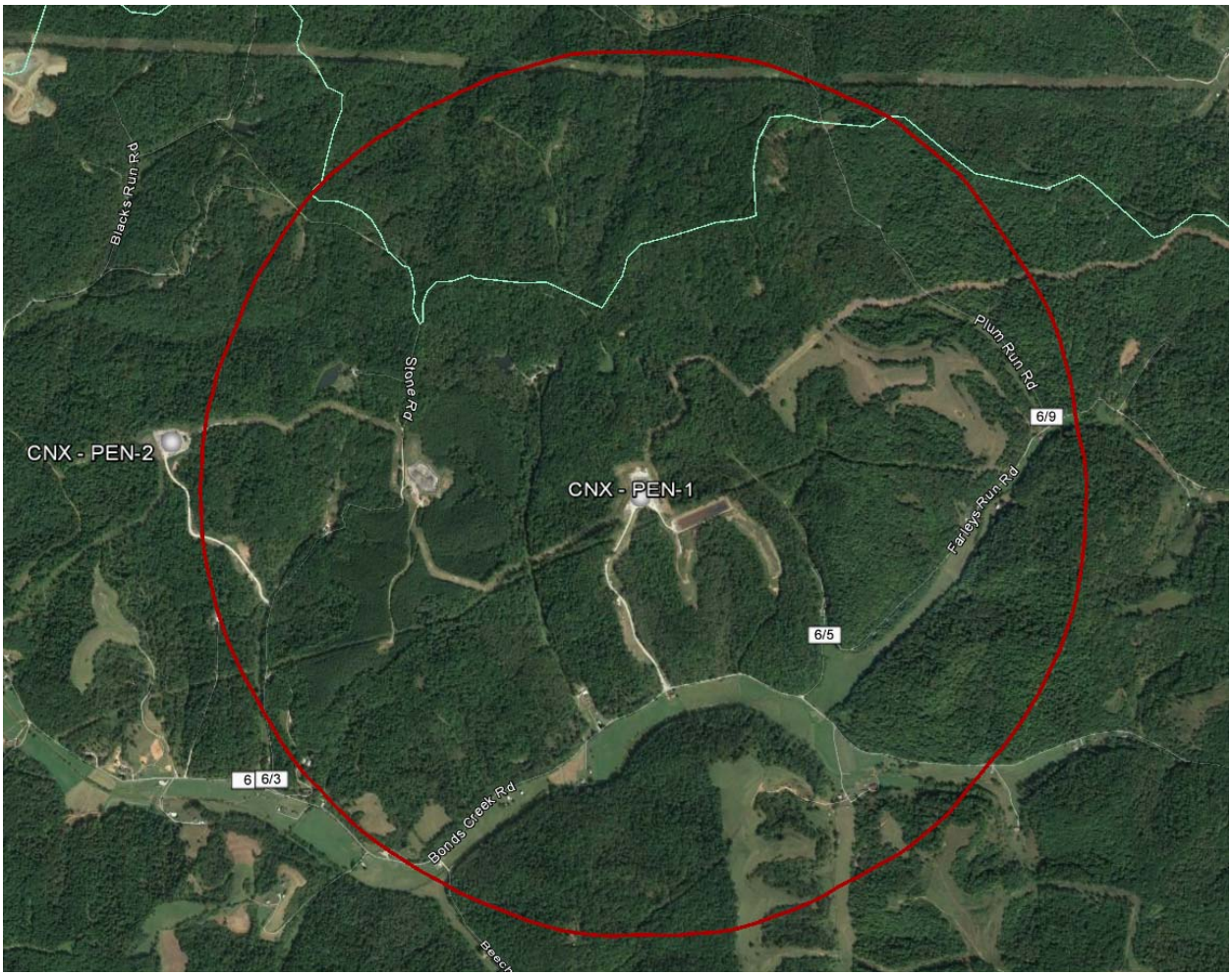


Figure 1 - Map of PEN-1 Station

Coordinates:
Latitude: 39°20'5.77" N
Longitude: 80°59'34.18"W

ATTACHMENT B

Siting Criteria Waiver *(Not Applicable)*

ATTACHMENT B - SITING CRITERIA WAIVER (NOT APPLICABLE)
If applicable, please complete this form and it must be notarized.

G70-D General Permit
Siting Criteria Waiver

WV Division of Air Quality 300' Waiver

I _____ hereby
Print Name

acknowledge and agree that _____ will
General Permit Applicant's Name

construct an emission unit(s) at a natural gas production facility
that will be located within 300' of my dwelling and/or business.

.

I hereby offer this waiver of siting criteria to the West Virginia Department of Environmental Protection Division of Air Quality as permission to construct, install and operate in such location.

Signed:

_____

Signature Date

_____

Signature Date

Taken, subscribed and sworn before me this _____ day of

_____, 20_____.

My commission expires: _____

SEAL_____
Notary Public

ATTACHMENT C

Business Certificate

ATTACHMENT C – CURRENT BUSINESS CERTIFICATE

If the applicant is a resident of West Virginia, the applicant should provide a copy of the current Business Registration Certificate issued to them from the West Virginia Secretary of State's Office. If the applicant is not a resident of the State of West Virginia, the registrant should provide a copy of the Certificate of Authority/Authority of LLC/Registration. This information is required for all sources to operate a business in West Virginia regardless of whether it is a construction, modification, or administrative update.

If you are a new business to West Virginia and have applied to the West Virginia Secretary of State's Office for a business license, please include a copy of your application.

Please note: Under the West Virginia Bureau of Employment Programs, 96CSR1, the DAQ may not grant, issue, or renew approval of any permit, general permit registration, or Certificate to Operate to any employing unit whose account is in default with the Bureau of Employment Programs Unemployment Compensation Division.

State of West Virginia

Certificate

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

CNX GAS COMPANY LLC

was duly authorized under the laws of this state to transact business in West Virginia as a foreign limited liability company on June 29, 2001.

The company is filed as a term company, for the term ending June 29, 2026.

I further certify that the company's most recent annual report, as required by West Virginia Code §31B-2-211, has been filed with our office and that a certificate of cancellation has not been filed.

Therefore, I hereby issue this

CERTIFICATE OF AUTHORIZATION

Given under my hand and the Great Seal of the State of West Virginia on this day of October 28, 2011

Natalie E. Tennant

Secretary of State

ATTACHMENT D

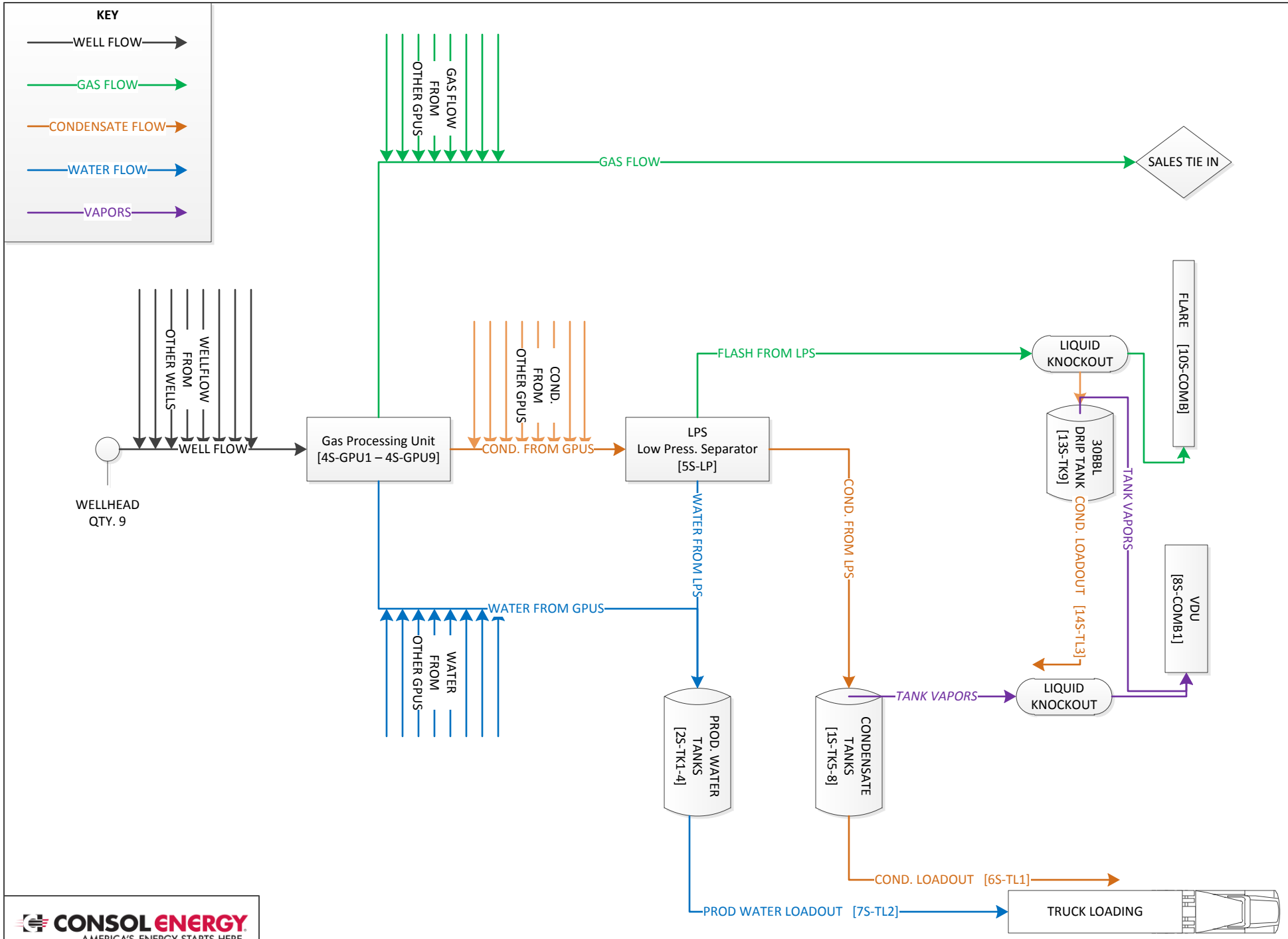
Process Flow Diagram

ATTACHMENT D – PROCESS FLOW DIAGRAM

Provide a diagram or schematic that supplements the process description of the operation. The process flow diagram must show all sources, components or facets of the operation in an understandable line sequence of operation. The process flow diagram should include the emission unit ID numbers, the pollution control device ID numbers, and the emission point ID numbers consistent with references in other attachments of the application. For a proposed modification, clearly identify the process areas, emission units, emission points, and/or control devices that will be modified, and specify the nature and extent of the modification.

Use the following guidelines to ensure a complete process flow diagram:

- The process flow diagram shall logically follow the entire process from beginning to end.
- Identify each emission source and air pollution control device with proper and consistent emission unit identification numbers, emission point identification numbers, and control device identification numbers.
- The process flow lines may appear different for clarity. For example, dotted lines may be used for vapor flow and solid lines used for liquid flow and arrows for direction of flow.
- The process flow lines may be color coded. For example: new or modified equipment may be red; old or existing equipment may be blue; different stages of preparation such as raw material may be green; and, finished product or refuse, another color.



CONSOL ENERGY
AMERICA'S ENERGY STARTS HERE.

DRAWN	J. VECELLIO		DWG Type: PFD	DWG NO: PENS-1 PROPOSED PFD – 2-2017	REV: 1
ISSUED	2/7/2017	SCALE	No Scale	SHEET	1 OF 1

ATTACHMENT E

Process Description

ATTACHMENT E – PROCESS DESCRIPTION

Provide a detailed written description of the operation for which the applicant is seeking a permit. The process description is used in conjunction with the process flow diagram to provide the reviewing engineer a complete understanding of the activity at the operation. Describe in detail and order the complete process operation.

Use the following guidelines to ensure a complete Process Description:

- The process flow diagram should be prepared first and used as a guide when preparing the process description. The written description shall follow the logical order of the process flow diagram.
- All emission sources, emission points, and air pollution control devices must be included in the process description.
- When modifications are proposed, describe the modifications and the effect the changes will have on the emission sources, emission points, control devices and the potential emissions.
- Proper emission source ID numbers must be used consistently in the process description, the process flow diagram, the emissions calculations, and the emissions summary information provided.
- Include any additional information that may facilitate the reviewers understanding of the process operation.

The process description is required for all sources regardless of whether it is a construction, modification, or administrative update.

ATTACHMENT E: PROCESS DESCRIPTION

CNX Gas Company LLC (CNX) is submitting this Class II General Permit (G70-D) application for the following proposed modifications at the Pennsboro 1 wellpad (PEN-1):

- Remove the existing Caterpillar G3304NA natural gas fired compressor engine (3S-ENG1) from the facility. The flash gas from the low pressure separator (LPS) will be routed to the flare (10S-COMB) for control.
- Modify the existing LEED vapor destruction unit's (8S-COMB1) maximum design heat input (MDHI) rating from 10.4 MMBtu/hr to 8.69 MMBtu/hr. Updated vendor specification sheets are submitted herein.
- Install one (1) 30 barrel (bbl) drip fluid tank (13S-TK9) that will be controlled by the existing vapor destruction unit (8S-COMB).
- Modify the existing flare's (10S-COMB) maximum design heat input (MDHI) rating from 19.7 MMBtu/hr (based on 1,200 BTU/SCF gas from LPS) to 26.2 MMBtu/hr (based on 1,600 BTU/SCF gas from LPS).
- Remove the existing LEED vapor combustor unit (8S-COMB2) from the current permit.

The PEN-1 wellpad is a natural gas production facility that consists of nine (9) wells. Incoming gas/liquid stream from underground wells will pass through the gas production units (4S-GPU 1-9) which will raise/maintain the temperature and then pass through the high pressure (3 phase) separators, which will separate gas (natural gas from the separator is sent to the sales line) from liquids (condensate and produced water). The produced water from the separator is transferred to the produced water storage tanks (2S-TK1-4).

The condensate fluids stream from the GPU will then pass through the low pressure separator, where it is heated (5S-LP) to volatilize (flash off) lighter hydrocarbons and separate condensate in the liquid stream. The flash gas from the low pressure separator passes through a liquid knock out vessel, which separates additional produced fluids (produced fluids is then transferred to the drip fluid tanks [13S-TK9]) from the flash gas. The flash gas is then sent to the flare (10S-COMB) for destruction. Condensate from the low pressure separator is then transferred to the condensate storage tanks (1S-TK5-8).

Working, breathing and flash emissions from the condensate, drip and produced water storage tanks are controlled by the vapor destruction unit (8S-COMB1). Condensate and produced water are transported off-site via tanker truck (6S-TL1, 14S-TL3 and 7S-TL2).

A process flow diagram is included as Attachment D.

ATTACHMENT F

Plot Plan

ATTACHMENT F – PLOT PLAN

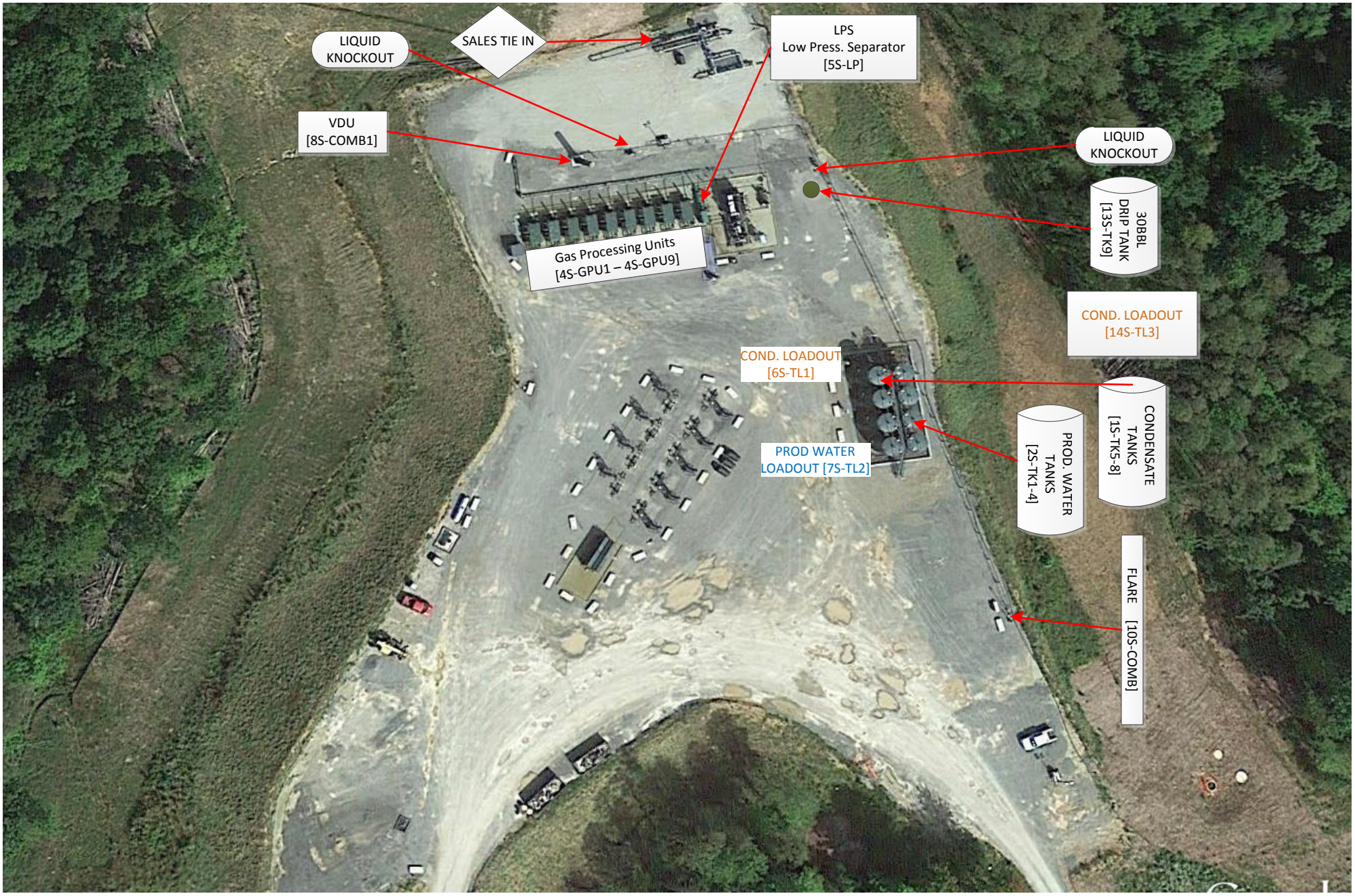
Provide an accurately scaled and detailed Plot Plan showing the locations of all emission units, emission points, and air pollution control devices. Show all emission units, affected facilities, enclosures, buildings and plant entrances and exits from the nearest public road(s) as appropriate. Note height, width and length of proposed or existing buildings and structures.

A scale between 1"=10' and 1"=200' should be used with the determining factor being the level of detail necessary to show operation or plant areas, affected facilities, emission unit sources, transfer points, etc. An overall small scale plot plan (e.g., 1"=300') should be submitted in addition to larger scale plot plans for process or activity areas (e.g., 1"=50') if the plant is too large to allow adequate detail on a single plot plan. Process or activity areas may be grouped for the enlargements as long as sufficient detail is shown.

Use the following guidelines to ensure a complete Plot Plan:

- Facility name
- Company name
- Company facility ID number (for existing facilities)
- Plot scale, north arrow, date drawn, and submittal date.
- Facility boundary lines
- Base elevation
- Lat/Long reference coordinates from the area map and corresponding reference point elevation
- Location of all point sources labeled with proper and consistent source identification numbers

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.



CONSOL ENERGY
AMERICA'S ENERGY STARTS HERE.

DRAWN	J. VECELLIO	DWG Type: PLOT	DWG NO: PENS-1 PROPOSED PLOT PLAN – 2-2017	REV: 1
ISSUED	2/7/2017	SCALE: No Scale		SHEET: 1 OF 1

ATTACHMENT G

Area Map

ATTACHMENT G – AREA MAP

Provide an Area Map showing the current or proposed location of the operation. On this map, identify plant or operation property lines, access roads and any adjacent dwelling, business, public building, school, church, cemetery, community or institutional building or public park within a 300’ boundary circle of the collective emission units.

Please provide a 300’ boundary circle on the map surrounding the proposed emission units collectively.

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

ATTACHMENT G: AREA MAP

Figure 1 - Map of PEN1 Station Location

Zone:	17
UTM Northing (KM):	4353.95
UTM Easting (KM):	500.62

ATTACHMENT H

G70-D Section Applicability Form

ATTACHMENT H – G70-D SECTION APPLICABILITY FORM

General Permit G70-D Registration
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, pneumatic pumps, reciprocating internal combustion engines (RICEs), tank truck/rail car 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 and Oil 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 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. Do not include fugitive emission sources in this table. Deminimis storage tanks shall be listed in the Attachment L table. 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]
1S-TK5-8	8E-COMB	Four (4) Condensate Storage Tanks	2016		400 bbl (each)	Existing; No change	8S-COMB	---
2S-TK1-4	8E-COMB	Four (4) Produced Water Storage Tanks	2016		400 bbl (each)	Existing; No change	8S-COMB	---
3S-ENG1	3E-ENG1	Caterpillar G304NA Comp. Engine	2015		95 hp	Existing – *to be removed*	4C	---
4S-GPU1	4E-GPU1	Gas Processing Unit	2015		1.0 MMBtu/hr	Existing; No change	None	---
4S-GPU2	4E-GPU2	Gas Processing Unit	2015		1.0 MMBtu/hr	Existing; No change	None	---
4S-GPU3	4E-GPU3	Gas Processing Unit	2015		1.0 MMBtu/hr	Existing; No change	None	---
4S-GPU4	4E-GPU4	Gas Processing Unit	2015		1.0 MMBtu/hr	Existing; No change	None	---
4S-GPU5	4E-GPU5	Gas Processing Unit	2015		1.0 MMBtu/hr	Existing; No change	None	---
4S-GPU6	4E-GPU6	Gas Processing Unit	2015		1.0 MMBtu/hr	Existing; No change	None	---
4S-GPU7	4E-GPU7	Gas Processing Unit	2015		1.0 MMBtu/hr	Existing; No change	None	---
4S-GPU8	4E-GPU8	Gas Processing Unit	2015		1.0 MMBtu/hr	Existing; No change	None	---
4S-GPU9	4E-GPU9	Gas Processing Unit	2015		1.0 MMBtu/hr	Existing; No change	None	---
5S-LP	5E-LP	LP Separator Heater	2015		0.75 MMBtu/hr	Existing; No change	None	---
6S-TL1, 14S-TL3	8E-COMB	Condensate Truck Loading	2016		4,193,545 gal/yr	Modified – Increased Throughput	8S-COMB	---
7S-TL2	8E-COMB	Produced Water Truck Loading	2016		17,097,234 gal/yr	Existing; No change	8S-COMB	---
12S-TEGEN	12E-TEGEN	Thermoelectric Generator	2015		1.44 gal/day	Existing; No change	---	---
13S-TK9	8E-COMB	Drip Tank	TBD		30 bbl	New	8S-COMB	---
8S-COMB	8E-COMB	Vapor Combustor	2016		8.69 MMBtu/hr	Existing; No change	None	---
10S-COMB	10E-COMB	Flare	2016		26.2 MMBtu/hr	Modified - Heat Rating Reduced	None	

[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.
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.

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: Fugitive Emissions

Leak Detection Method Used	☐ Audible, visual, and olfactory (AVO) inspections	☐ Infrared (FLIR) cameras	☒ Other (please describe) Will satisfy condition 12.1.1 of the G70-D	☐ 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, CO_2e)
Pumps	☐ Yes ☒ No	14	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☐ Gas ☒ Liquid ☐ Both	4.2E-03	1.4E-04	0.49
Valves	☐ Yes ☒ No	495	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☒ Gas ☐ Liquid ☐ Both	3.60	0.12	48.64
Safety Relief Valves	☐ Yes ☒ No	33	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☒ Gas ☐ Liquid ☐ Both	0.47	0.02	4.80
Open Ended Lines	☐ Yes ☒ No	38	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☐ Gas ☐ Liquid ☒ Both	0.12	4.1E-03	8.32
Sampling Connections	☐ Yes ☐ No		N/A	☐ Gas ☐ Liquid ☐ Both	---	---	---
Connections (Not sampling)	☐ Yes ☒ No	2,186	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☐ Gas ☐ Liquid ☒ Both	0.71	0.02	23.86
Compressors	☐ Yes ☐ No		N/A	☒ Gas ☐ Liquid ☐ Both	---	---	---
Flanges	☐ Yes ☒ No	1,093	U.S. EPA. Office of Air Quality Planning and Standards. Protocol for Equipment Leak Emission Estimates. Table 2-1. (EPA-453/R-95-017, 1995).	☐ Gas ☐ Liquid ☐ Both	0.69	0.02	119.30
Other[1]	☐ Yes ☒ No	45	40 CFR 98 Subpart W	☒ Gas ☐ Liquid ☐ Both	8.03	0.27	736.90

[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.):
Pneumatic Controller count is 'Other' category. An estimate of Miscellaneous Gas Venting emissions are included in the Emission Calculations and serve to include such sources as compressor venting, pigging, vessel blowdowns and other sources.

Please indicate if there are any closed vent bypasses (include component): N/A

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

ATTACHMENT K

Gas Well 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?
47-85-10009				
47-85-10012				
47-85-10011				
47-85-10010				
47-85-10013				
47-85-10031				
47-85-10032				
47-85-10033				
47-85-10034				

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 may be provided on the application without the state code (047).

Every oil and gas well permitted in West Virginia since 1929 has been issued an API 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 Vessel 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 PEN1	2. Tank Name Condensate Tanks
3. Emission Unit ID number 1STK5-8	4. Emission Point ID number 8E-COMB
5. Date Installed , Modified or Relocated *(for existing tanks)* 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	6. Type of change: ☐ New construction ☐ New stored material ☒ Other (no change) ☐ Relocation
7A. Description of Tank Modification *(if applicable)* N/A	
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. 400 bbls	
9A. Tank Internal Diameter (ft.) 12	9B. Tank Internal Height (ft.) 20
10A. Maximum Liquid Height (ft.) 20	10B. Average Liquid Height (ft.) 10
11A. Maximum Vapor Space Height (ft.) 20	11B. Average Vapor Space Height (ft.) 10
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume". 400 bbls	
13A. Maximum annual throughput (gal/yr) **See attached emissions calculations for all throughput values**	13B. Maximum daily throughput (gal/day) **See attached emissions calculations for all throughput values**
14. Number of tank turnovers per year **See attached emissions calculations for all throughput values**	15. Maximum tank fill rate (gal/min) **See attached emissions calculations for all throughput values**
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 (describe)	

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:	
☐ Does Not Apply	☐ Rupture Disc (psig)
☐ Inert Gas Blanket of _____	☐ Carbon Adsorption[1]
☒ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)	
☒ Conservation Vent (psig)	☐ Condenser[1]
-0.03 Vacuum Setting 0.03 Pressure Setting	
☐ Emergency Relief Valve (psig)	

Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☒ No

[1] 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 Emissions Loss		Estimation Method[1]
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
See attached Emissions Calculation for all values									

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

Remember to attach emissions calculations, including TANKS Summary Sheets and other modeling summary sheets if applicable.

TANK CONSTRUCTION AND OPERATION INFORMATION

21. Tank Shell Construction:

☒ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

21A. Shell Color: Tnemec Green	21B. Roof Color: Tnemec Green	21C. Year Last Painted: 2013

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):

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):	24B. If yes, for cone roof, provide slop (ft/ft): 1:12

25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒

25A. Year Internal Floaters Installed:

25B. Primary Seal Type *(check one):* ☐ 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. Continuous sheet construction:

☐ 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, # of columns:	26G. For column supported tanks, diameter of column:

27. Closed Vent System with VRU? ☒ Yes ☐ No

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

SITE INFORMATION - Not Applicable: Tank calculations performed using ProMax software

29. Provide the city and state on which the data in this section are based:

30. Daily Avg. Ambient Temperature (°F):	31. Annual Avg. Maximum Temperature (°F):
32. Annual Avg. Minimum Temperature (°F):	33. Avg. Wind Speed (mph):

34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):		35. Atmospheric Pressure (psia):	
LIQUID INFORMATION - Not Applicable: Tank calculations performed using ProMax software			
36. Avg. daily temperature range of bulk liquid (°F):	36A. Minimum (°F):	36B. Maximum (°F):	
37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):	37B. Maximum (psig):	
38A. Minimum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39A. Avg. liquid surface temperature (°F):		39B. Corresponding vapor pressure (psia):	
40A. Maximum liquid surface temperature (°F):		40B. Corresponding vapor pressure (psia):	
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
41A. Material name and composition:			
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):			
41E. Vapor molecular weight (lb/lb-mole):			
41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name PEN1	2. Tank Name Produced Water Tanks
3. Emission Unit ID number 2STK1-4	4. Emission Point ID number 8E-COMB
5. Date Installed , Modified or Relocated *(for existing tanks)* 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	6. Type of change: ☐ New construction ☐ New stored material ☒ Other (no change) ☐ Relocation
7A. Description of Tank Modification *(if applicable)* N/A	
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. 400 bbls	
9A. Tank Internal Diameter (ft.) 12	9B. Tank Internal Height (ft.) 20
10A. Maximum Liquid Height (ft.) 20	10B. Average Liquid Height (ft.) 10
11A. Maximum Vapor Space Height (ft.) 20	11B. Average Vapor Space Height (ft.) 10
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume". 400 bbls	
13A. Maximum annual throughput (gal/yr) **See attached emissions calculations for all throughput values**	13B. Maximum daily throughput (gal/day) **See attached emissions calculations for all throughput values**
14. Number of tank turnovers per year **See attached emissions calculations for all throughput values**	15. Maximum tank fill rate (gal/min) **See attached emissions calculations for all throughput values**
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 (describe)	

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☐ Does Not Apply ☐ Rupture Disc (psig)

☐ Inert Gas Blanket of _____ ☐ Carbon Adsorption[1]

☒ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)

☒ Conservation Vent (psig) ☐ Condenser[1]

-0.03 psig Vacuum Setting 0.03 psig Pressure Setting

☐ Emergency Relief Valve (psig)

Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☒ No

[1] 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 Emissions Loss		Estimation Method[1]
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
See attached Emissions Calculation for all values									

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

Remember to attach emissions calculations, including TANKS Summary Sheets and other modeling summary sheets if applicable.

TANK CONSTRUCTION AND OPERATION INFORMATION

21. Tank Shell Construction:

☒ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

21A. Shell Color: Tnemec Green	21B. Roof Color: Tnemec Green	21C. Year Last Painted: 2013

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):

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):	24B. If yes, for cone roof, provide slop (ft/ft): 1:12

25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒

25A. Year Internal Floaters Installed:

25B. Primary Seal Type *(check one):* ☐ 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. Continuous sheet construction:

☐ 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, # of columns:	26G. For column supported tanks, diameter of column:

27. Closed Vent System with VRU? ☒ Yes ☐ No

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

SITE INFORMATION - Not Applicable: Tank calculations performed using ProMax software

29. Provide the city and state on which the data in this section are based:

30. Daily Avg. Ambient Temperature (°F):	31. Annual Avg. Maximum Temperature (°F):
32. Annual Avg. Minimum Temperature (°F):	33. Avg. Wind Speed (mph):

34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):		35. Atmospheric Pressure (psia):	
LIQUID INFORMATION - Not Applicable: Tank calculations performed using ProMax software			
36. Avg. daily temperature range of bulk liquid (°F):	36A. Minimum (°F):	36B. Maximum (°F):	
37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):	37B. Maximum (psig):	
38A. Minimum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39A. Avg. liquid surface temperature (°F):		39B. Corresponding vapor pressure (psia):	
40A. Maximum liquid surface temperature (°F):		40B. Corresponding vapor pressure (psia):	
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
41A. Material name and composition:			
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):			
41E. Vapor molecular weight (lb/lb-mole):			
41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name PEN1	2. Tank Name Drip Tank
3. Emission Unit ID number 13S-TK9	4. Emission Point ID number 8E-COMB
5. Date Installed , Modified or Relocated *(for existing tanks)* 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	6. Type of change: ☒ New construction ☐ New stored material ☐ Other (no change) ☐ Relocation
7A. Description of Tank Modification *(if applicable)* N/A	
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. 30 bbls	
9A. Tank Internal Diameter (ft.) 6	9B. Tank Internal Height (ft.) 5.75
10A. Maximum Liquid Height (ft.) 5.75	10B. Average Liquid Height (ft.) 2.87
11A. Maximum Vapor Space Height (ft.) 5.75	11B. Average Vapor Space Height (ft.) 2.87
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume". 400 bbls	
13A. Maximum annual throughput (gal/yr) **See attached emissions calculations for all throughput values**	13B. Maximum daily throughput (gal/day) **See attached emissions calculations for all throughput values**
14. Number of tank turnovers per year **See attached emissions calculations for all throughput values**	15. Maximum tank fill rate (gal/min) **See attached emissions calculations for all throughput values**
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 (describe)	

PRESSURE/VACUUM CONTROL DATA

19. Check as many as apply:

☐ Does Not Apply ☐ Rupture Disc (psig)

☐ Inert Gas Blanket of _____ ☐ Carbon Adsorption[1]

☒ Vent to Vapor Combustion Device[1] (vapor combustors, flares, thermal oxidizers, enclosed combustors)

☒ Conservation Vent (psig) ☐ Condenser[1]

-0.03 psig Vacuum Setting 0.03 psig Pressure Setting

☐ Emergency Relief Valve (psig)

Vacuum Setting Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☒ No

[1] 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 Emissions Loss		Estimation Method[1]
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
See attached Emissions Calculation for all values									

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

Remember to attach emissions calculations, including TANKS Summary Sheets and other modeling summary sheets if applicable.

TANK CONSTRUCTION AND OPERATION INFORMATION

21. Tank Shell Construction:

☒ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

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

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):

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):	24B. If yes, for cone roof, provide slop (ft/ft): 1:12

25. Complete item 25 for **Floating Roof Tanks** ☐ Does not apply ☒

25A. Year Internal Floaters Installed:

25B. Primary Seal Type *(check one):* ☐ 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. Continuous sheet construction:

☐ 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, # of columns:	26G. For column supported tanks, diameter of column:

27. Closed Vent System with VRU? ☒ Yes ☐ No

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

SITE INFORMATION - Not Applicable: Tank calculations performed using ProMax software

29. Provide the city and state on which the data in this section are based:

30. Daily Avg. Ambient Temperature (°F):	31. Annual Avg. Maximum Temperature (°F):
32. Annual Avg. Minimum Temperature (°F):	33. Avg. Wind Speed (mph):
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):	35. Atmospheric Pressure (psia):

LIQUID INFORMATION - Not Applicable: Tank calculations performed using ProMax software

36. Avg. daily temperature range of bulk liquid (°F):	36A. Minimum (°F):	36B. Maximum (°F):	
37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):	37B. Maximum (psig):	
38A. Minimum liquid surface temperature (°F):	38B. Corresponding vapor pressure (psia):		
39A. Avg. liquid surface temperature (°F):	39B. Corresponding vapor pressure (psia):		
40A. Maximum liquid surface temperature (°F):	40B. Corresponding vapor pressure (psia):		
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
41A. Material name and composition:			
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):			
41E. Vapor molecular weight (lb/lb-mole):			
41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

STORAGE TANK DATA TABLE

List all deminimis storage tanks (i.e. lube oil, glycol, diesel etc.)

Source ID #[1]	Status[2]	Content[3]	Volume[4]

1. Enter the appropriate Source Identification Numbers (Source ID #) for each storage tank located at the well site. Tanks should be designated T01, T02, T03, etc.
2. Enter storage tank Status using the following:
   - EXIST Existing Equipment
   - NEW Installation of New Equipment
   - REM Equipment Removed
3. Enter storage tank content such as condensate, pipeline liquids, glycol (DEG or TEG), lube oil, diesel, mercaptan etc.
4. Enter the maximum design storage tank volume in gallons.

ATTACHMENT M

Heaters 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#[1]	Emission Point ID#[2]	Emission Unit Description (manufacturer, model #)	Year Installed/ Modified	Type[3] and Date of Change	Maximum Design Heat Input (MMBTU/hr)[4]	Fuel Heating Value (BTU/scf)[5]
4S-GPU1	4E-GPU1	Gas Processing Unit	2015	Existing; No change	1.0 MMBtu/hr	~1,249
4S-GPU2	4E-GPU2	Gas Processing Unit	2015	Existing; No change	1.0 MMBtu/hr	~1,249
4S-GPU3	4E-GPU3	Gas Processing Unit	2015	Existing; No change	1.0 MMBtu/hr	~1,249
4S-GPU4	4E-GPU4	Gas Processing Unit	2015	Existing; No change	1.0 MMBtu/hr	~1,249
4S-GPU5	4E-GPU5	Gas Processing Unit	2015	Existing; No change	1.0 MMBtu/hr	~1,249
4S-GPU6	4E-GPU6	Gas Processing Unit	2015	Existing; No change	1.0 MMBtu/hr	~1,249
4S-GPU7	4E-GPU7	Gas Processing Unit	2015	Existing; No change	1.0 MMBtu/hr	~1,249
4S-GPU8	4E-GPU8	Gas Processing Unit	2015	Existing; No change	1.0 MMBtu/hr	~1,249
4S-GPU9	4E-GPU9	Gas Processing Unit	2015	Existing; No change	1.0 MMBtu/hr	~1,249
5S-LP	5E-LP	LP Separator Heater	2015	Existing; No change	0.75 MMBtu/hr	~1,249

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

Engines Data Sheet (Not Applicable)

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#[1]			
Engine Manufacturer/Model			
Manufacturers Rated bhp/rpm			
Source Status[2]			
Date Installed/ Modified/Removed/Relocated[3]			
Engine Manufactured /Reconstruction Date[4]			
Check all applicable Federal Rules for the engine (include EPA Certificate of Conformity if applicable)[5]	☐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[6]			
APCD Type[7]			
Fuel Type[8]			
H_2S (gr/100 scf)			
Operating bhp/rpm			
BSFC (BTU/bhp-hr)			
Hourly Fuel Throughput	ft^3/hr gal/hr	ft^3/hr gal/hr	ft^3/hr gal/hr
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	$MMft^3$/yr gal/yr	$MMft^3$/yr gal/yr	$MMft^3$/yr gal/yr
Fuel Usage or Hours of Operation Metered	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐

	Pollutant[10]	**Hourly PTE (lb/hr)[11]**	**Annual PTE (tons/year)[11]**	**Hourly PTE (lb/hr)[11]**	**Annual PTE (tons/year)[11]**	**Hourly PTE (lb/hr)[11]**	**Annual PTE (tons/year)[11]**
	NO_x						
	CO						
	VOC						
	SO_2						
	PM_{10}						
	Formaldehyde						
	Total HAPs						
	GHG (CO_2e)						

1 Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion engine/generator engine located at the well site. Multiple engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. Microturbine generator engines should be designated MT-1, MT-2, MT-3 etc. If more than three (3) engines exist, please use additional sheets.

2 Enter the Source Status using the following codes:

NS Construction of New Source (installation) ES Existing Source

MS	Modification of Existing Source	RS	Relocated Source
REM	Removal of Source		

3 Enter the date (or anticipated date) of the engine's installation (construction of source), modification, relocation or removal.

4 Enter the date that the engine was manufactured, modified or reconstructed.

5 Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart IIII/JJJJ? If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

6 Enter the Engine Type designation(s) using the following codes:

2SLB	Two Stroke Lean Burn	4SRB	Four Stroke Rich Burn
4SLB	Four Stroke Lean Burn		

7 Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	OxCat	Oxidation Catalyst
SCR	Lean Burn & Selective Catalytic Reduction		

8 Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas /Production Gas	D	Diesel

9 Enter the Potential Emissions Data Reference designation using the following codes. Attach all reference data used.

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

10 Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.

11 PTE for engines shall be calculated from manufacturer's data unless unavailable.

Engine Air Pollution Control Device
(Emission Unit ID#, use extra pages as necessary)

Air Pollution Control Device Manufacturer's Data Sheet included?
Yes ☐ No ☐

☐ NSCR ☐ SCR ☐ Oxidation Catalyst

Provide details of process control used for proper mixing/control of reducing agent with gas stream: Sequential multi-part fuel injection

Manufacturer:	Model:
Design Operating Temperature:	Design gas volume: scfm
Service life of catalyst:	Provide manufacturer data? ☐Yes ☐ No
Volume of gas handled:	Operating temperature range for NSCR/Ox Cat: From °F to °F
Reducing agent used, if any:	Ammonia slip (ppm):
Pressure drop against catalyst bed (delta P):	
Provide description of warning/alarm system that protects unit when operation is not meeting design conditions:	
Is temperature and pressure drop of catalyst required to be monitored per 40CFR63 Subpart ZZZZ? ☐ Yes ☐ No	
How often is catalyst recommended or required to be replaced (hours of operation)?	
How often is performance test required? ☐ Initial ☐ Annual ☐ Every 8,760 hours of operation ☐ Field Testing Required ☐ No performance test required. If so, why (please list any maintenance required and the applicable sections in NSPS/GACT,	

ATTACHMENT O

Truck Loading Data Sheet

ATTACHMENT O – TANKER TRUCK/RAIL CAR LOADING DATA SHEET

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/rail cars. Use extra pages if necessary.

Truck/Rail Car Loadout Collection Efficiencies

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

- For tanker trucks/rail cars passing the MACT level annual leak test – 99.2%
- For tanker trucks/rail cars passing the NSPS level annual leak test – 98.7%
- For tanker trucks/rail cars 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/rail car 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#: 6S-TL1, 7S-TL2, 14S-TL3	Emission Point ID#: 8E-COMB	Year Installed/Modified: 2016 (6S-TL1, 7S-TL2), TBD (14S-TL3)
Emission Unit Description: Uncaptured losses from loading of produced and condensate fluids into tanker trucks		
Loading Area Data		
Number of Pumps:	Number of Liquids Loaded: 2	Max number of trucks/rail cars loading at one (1) time: 1
Are tanker trucks/rail cars pressure tested for leaks at this or any other location? ☒ Yes ☐ No ☐ Not Required If Yes, Please describe: Tanker trucks are required to be DOT pressure tested.		
Provide description of closed vent system and any bypasses. Trucks utilize vapor recovery lines to route displaced vapors back into battery of tanks.		
Are any of the following truck/rail car loadout systems utilized? ☐ Closed System to tanker truck/rail car passing a MACT level annual leak test? ☐ Closed System to tanker truck/rail car passing a NSPS level annual leak test? ☒ Closed System to tanker truck/rail car 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	24	24	24	24
Days/week	7	7	7	7

Bulk Liquid Data (use extra pages as necessary)

Liquid Name	Condensate	Produced Water	Drip Fluids
Max. Daily Throughput (1000 gal/day)	See attached emissions calculations for all throughput values	See attached emissions calculations for all throughput values	See attached emissions calculations for all throughput values
Max. Annual Throughput (1000 gal/yr)	See attached emissions calculations for all throughput values	See attached emissions calculations for all throughput values	See attached emissions calculations for all throughput values
Loading Method[1]	SUB	SUB	SUB
Max. Fill Rate (gal/min)	Varies	Varies	Varies
Average Fill Time (min/loading)	Varies	Varies	Varies
Max. Bulk Liquid Temperature (°F)	See ProMax results	See ProMax results	See ProMax results
True Vapor Pressure[2]	See ProMax results	See ProMax results	See ProMax results
Cargo Vessel Condition[3]	C	C	C

Control Equipment or Method[4]		VB, ECD (captured loading losses)	VB, ECD (captured loading losses)	VB, ECD (captured loading losses)
Max. Collection Efficiency (%)		70%	70%	70%
Max. Control Efficiency (%)		98%	98%	98%
Max.VOC Emission Rate	Loading (lb/hr)	See attached emission calculations for breakdown	See attached emission calculations for breakdown	See attached emission calculations for breakdown
	Annual (ton/yr)	See attached emission calculations for breakdown	See attached emission calculations for breakdown	See attached emission calculations for breakdown
Max.HAP Emission Rate	Loading (lb/hr)	See attached emission calculations for breakdown	See attached emission calculations for breakdown	See attached emission calculations for breakdown
	Annual (ton/yr)	See attached emission calculations for breakdown	See attached emission calculations for breakdown	See attached emission calculations for breakdown
Estimation Method[5]		AP-42 Section 5.2 Methodology (via ProMax)	AP-42 Section 5.2 Methodology (via ProMax)	AP-42 Section 5.2 Methodology (via 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 service)
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 P

Glycol Dehydrator Data Sheet *(Not Applicable)*

ATTACHMENT P – GLYCOL DEHYDRATION UNIT DATA SHEET - NOT APPLICABLE

Complete this data sheet for each Glycol Dehydration Unit, Reboiler, Flash Tank and/or Regenerator at the facility. Include gas sample analysis and GRI- GLYCalc™ input and aggregate report. Use extra pages if necessary.

Manufacturer:	Model:
Max. Dry Gas Flow Rate: mmscf/day	Reboiler Design Heat Input: MMBTU/hr
Design Type: ☐ TEG ☐ DEG ☐ EG	Source Status[1]:
Date Installed/Modified/Removed[2]:	Regenerator Still Vent APCD/ERD[3]:
Control Device/ERD ID#[3]:	Fuel HV (BTU/scf):
H_2S Content (gr/100 scf):	Operation (hours/year):
Pump Rate (gpm):	
Water Content (wt %) in: Wet Gas:	Dry Gas:

Is the glycol dehydration unit exempt from 40CFR63 Section 764(d)? ☐ Yes ☐ No: If Yes, answer the following:

The actual annual average flowrate of natural gas to the glycol dehydration unit is less than 85 thousand standard cubic meters per day, as determined by the procedures specified in §63.772(b)(1) of this subpart. ☐ Yes ☐ No

The actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram per year (1 ton per year), as determined by the procedures specified in §63.772(b)(2) of this subpart. ☐ Yes ☐ No

Is the glycol dehydration unit located within an Urbanized Area (UA) or Urban Cluster (UC)? ☐ Yes ☐ No

Is a lean glycol pump optimization plan being utilized? ☐ Yes ☐ No

Recycling the glycol dehydration unit back to the flame zone of the reboiler.
☐ Yes ☐ No

Recycling the glycol dehydration unit back to the flame zone of the reboiler and mixed with fuel.
☐ Yes ☐ No

What happens when temperature controller shuts off fuel to the reboiler?
☐ Still vent emissions to the atmosphere.
☐ Still vent emissions stopped with valve.
☐ Still vent emissions to glow plug.

Please indicate if the following equipment is present.
☐ Flash Tank
☐ Burner management system that continuously burns condenser or flash tank vapors

Control Device Technical Data

Pollutants Controlled	Manufacturer's Guaranteed Control Efficiency (%)

Emissions Data

Emission Unit ID / Emission Point ID[4]	Description	Calculation Methodology[5]	PTE[6]	Controlled Maximum Hourly Emissions (lb/hr)	Controlled Maximum Annual Emissions (tpy)
	Reboiler Vent		NO_x		
			CO		
			VOC		
			SO_2		
			PM_{10}		

			GHG (CO_2e)		
	Glycol Regenerator Still Vent	GRI-GlyCalc™	VOC		
		GRI-GlyCalc™	Benzene		
		GRI-GlyCalc™	Toluene		
		GRI-GlyCalc™	Ethylbenzene		
		GRI-GlyCalc™	Xylenes		
		GRI-GlyCalc™	n-Hexane		
	Glycol Flash Tank	GRI-GlyCalc™	VOC		
		GRI-GlyCalc™	Benzene		
		GRI-GlyCalc™	Toluene		
		GRI-GlyCalc™	Ethylbenzene		
		GRI-GlyCalc™	Xylenes		
		GRI-GlyCalc™	n-Hexane		

1 Enter the Source Status using the following codes:
NS Construction of New Source ES Existing Source
MS Modification of Existing Source

2 Enter the date (or anticipated date) of the glycol dehydration unit's installation (construction of source), modification or removal.

3 Enter the Air Pollution Control Device (APCD)/Emission Reduction Device (ERD) type designation using the following codes and the device ID number:
NA None CD Condenser FL Flare
CC Condenser/Combustion Combination TO Thermal Oxidizer O Other (please list)

4 Enter the appropriate Emission Unit ID Numbers and Emission Point ID Numbers for the glycol dehydration unit reboiler vent and glycol regenerator still vent. The glycol dehydration unit reboiler vent and glycol regenerator still vent should be designated RBV-1 and RSV-1, respectively. If the well site incorporates multiple glycol dehydration units, a Glycol Dehydration Emission Unit Data Sheet shall be completed for each, using Source Identification RBV-2 and RSV-2, RBV-3 and RSV-3, etc.

5 Enter the Potential Emissions Data Reference designation using the following codes:
MD Manufacturer's Data AP AP-42
GR GRI-GLYCalc™ OT Other (please list)

6 Enter the Reboiler Vent and Glycol Regenerator Still Vent Potential to Emit (PTE) for the listed regulated pollutants in lbs per hour and tons per year. The Glycol Regenerator Still Vent potential emissions may be determined using the most recent version of the thermodynamic software model GRI-GLYCalc™ (Radian International LLC & Gas Research Institute). **Attach all referenced Potential Emissions Data (or calculations) and the GRI-GLYCalc™ Aggregate Calculations Report (shall include emissions reports, equipment reports, and stream reports) to this Glycol Dehydration Emission Unit Data Sheet(s). Backup pumps do not have to be considered as operating for purposes of PTE.** This PTE data shall be incorporated in the Emissions Summary Sheet.

ATTACHMENT Q

Pneumatic Controller 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 (Not Applicable)

ATTACHMENT R – PNEUMATIC PUMP DATA SHEET (NOT APPLICABLE)

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 Data Sheet

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

Complete the applicable air pollution control device sheets 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: **Not Applicable**	Make/Model:
Primary Control Device ID:	Make/Model:
Control Efficiency (%):	APCD/ERD Data Sheet Completed: ☐ Yes ☐ No
Secondary Control Device ID:	Make/Model:
Control Efficiency (%):	APCD/ERD Data Sheet Completed: ☐ Yes ☐ No

VAPOR COMBUSTION
(Including Enclosed Combustors)

General Information

Control Device ID#: **8S-COMB**	Installation Date: 2016 ☐ New ☐ Modified ☐ Relocated	
Maximum Rated Total Flow Capacity 5,833 scfh 140,000 scfd	Maximum Design Heat Input (from mfg. spec sheet) 8.69 MMBTU/hr	Design Heat Content 1,500 BTU/scf

Control Device Information

Type of Vapor Combustion Control?

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

Manufacturer: Leed Enclosed Combustor Model: LC30-0017-000	Hours of operation per year? 8,760

List the emission units whose emissions are controlled by this vapor control device

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
1S-TK5-8	Four (4) Condensate Storage Tanks	13S-TK9	One (1) Drip Fluid tank
2S-TK1-4	Four (4) Produced Water Storage Tanks		
6S-TL1, 7S-TL2, 14S-TL3	Captured Liquid Loading		

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	4 feet	☐ Yes ☐ No ☒ N/A Provide determination.

Waste Gas Information

Maximum Waste Gas Flow Rate	Heat Value of Waste Gas Stream	Exit Velocity of the Emissions Stream
97 (scfm)	Varies Varies BTU/ft^3	Varies (ft/s)

Provide an attachment with the 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	~40 scfh	50,000 BTU/hr	☒ Yes ☐ No

If automatic re-ignition is used, please describe the method. Cimarron re-ignition ignitor box that will be programmed for re-ignition.

Is pilot flame equipped with a monitor to detect the presence of the flame? ☒ Yes ☐ No	If Yes, what type? ☒ Thermocouple ☐ Infrared ☐ Ultraviolet ☐ Camera ☐ Other:

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

Additional information attached? ☒ Yes ☐ No
Please attach copies of manufacturer's data sheets, drawings, flame demonstration per §60.18 or §63.11(b) and performance testing.

VAPOR COMBUSTION
(Including Enclosed Combustors)

General Information

Control Device ID#: **10S-COMB**	Installation Date: 2016 ☐ New ☒ Modified ☐ Relocated	
Maximum Rated Total Flow Capacity ~16,417 scfh 0.394 MMscfd	Maximum Design Heat Input (from mfg. spec sheet) 26.2	Design Heat Content 1,600 BTU/scf

Control Device Information

Type of Vapor Combustion Control?

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

Manufacturer: National Oil Varco Model: Produced Gas Flare	Hours of operation per year? 8,760

List the emission units whose emissions are controlled by this vapor control device

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
5S-LP	Low Pressure Separator		

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	TBD	TBD	☐ Yes ☐ No ☒ N/A Provide determination.

Waste Gas Information

Maximum Waste Gas Flow Rate	Heat Value of Waste Gas Stream	Exit Velocity of the Emissions Stream
274 (scfm)	Varies BTU/ft^3	Varies (ft/s)

Provide an attachment with the 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?
1	~60 scfh	70,000 BTU/hr	☒ Yes ☐ No

If automatic re-ignition is used, please describe the method. Cimarron re-ignition ignitor box that will be programmed for re-ignition.

Is pilot flame equipped with a monitor to detect the presence of the flame? ☒ Yes ☐ No	If Yes, what type? ☒ Thermocouple ☐ Infrared ☐ Ultraviolet ☐ Camera ☐ Other:

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

Additional information attached? ☒ Yes ☐ No
Please attach copies of manufacturer's data sheets, drawings, flame demonstration per §60.18 or §63.11(b) and performance testing.

CONDENSER – Not Applicable		
General Information		
Control Device ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated	
Manufacturer:	Model:	Control Device Name:
Control Efficiency (%):		
Manufacturer's required temperature range for control efficiency. °F		
Describe the warning and/or alarm system that protects against operation when unit is not meeting the design requirements:		
Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty.		
Additional information attached? ☐ Yes ☐ No Please attach copies of manufacturer's data sheets.		
Is condenser routed to a secondary APCD or ERD? ☐ Yes ☐ No		

ADSORPTION SYSTEM – Not Applicable		
General Information		
Control Device ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated	
Manufacturer:	Model:	Control Device Name:
Design Inlet Volume: scfm	Adsorbent charge per adsorber vessel and number of adsorber vessels:	
Length of Mass Transfer Zone supplied by the manufacturer:	Adsorber diameter: ft Adsorber area: ft^2	
Adsorbent type and physical properties:	Overall Control Efficiency (%):	
Working Capacity of Adsorbent (%):		
Operating Parameters		
Inlet volume: scfm @ °F		
Adsorption time per adsorption bed (life expectancy):	Breakthrough Capacity (lbs of VOC/100 lbs of adsorbent):	
Temperature range of carbon bed adsorber. °F - °F		
Control Device Technical Data		
Pollutants Controlled	Manufacturer's Guaranteed Control Efficiency (%)	
Describe the warning and/or alarm system that protects against operation when unit is not meeting the design requirements:		
Has the control device been tested by the manufacturer and certified?		
Describe all operating ranges and maintenance procedures required by the manufacturer to maintain the warranty.		
Additional information attached? ☐ Yes ☐ No Please attach copies of manufacturer's data sheets, drawings, and performance testing.		

VAPOR RECOVERY UNIT – Not Applicable

General Information

Emission Unit ID#:	Installation Date: ☐ New ☐ Modified ☐ Relocated

Device Information

Manufacturer:
Model:

List the emission units whose emissions are controlled by this vapor recovery unit

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description

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

Additional information attached? ☐ Yes ☐ No
Please attach copies of manufacturer's data sheets, drawings, and performance testing.

The registrant may claim a capture and control efficiency of 95 % (which accounts for 5% downtime) for the vapor recovery unit.

The registrant may claim a capture and control efficiency of 98% if the VRU has a backup flare that meet the requirements of Section 8.1.2 of this general permit.

The registrant may claim a capture and control efficiency of 98% if the VRU has a backup VRU.

		Item/Tag No.:		Page	1	of	2
		Project No.:		Revision:	B		
		Project:		Date:	27 February 2014		
	Enviromental Control Equipment Data Sheet			By:	JS		
		P.O. No.:	-	Checked:	SG		
		RFQ No.:	-	Approved:	MS		
	Client:	Ref. P&ID:	-				
	Site:			Supplier:	LEED FABRICATION		
	Unit/Lease:	Remarks:	-	Model No.:	L30-0011-00		

GENERAL

1	Design Code:		NDE:	LEED Fabrication Standards
2	Service:		Customer Specs:	☐ Yes
3	Description:	Standard Dual Stage 48 High Efficiency Combustor		☑ No

PROCESS DATA

	Gas Composition:	mol %	Process Conditions: Variable	Value	Units
4	Methane		Flow Rate	Up to 140	Mscfd
5	Ethane		Pressure	Up to 12	oz/in2
6	Propane		Temperature		°F
7	I-Butane		Molecular Weight		
8	n-Butane		Process/Waste Stream	☑ Gas	☐ Liquid
9	I-Pentane		Detailed Process Description / Process Notes:		
10	n-Pentane		1. Turndown 10:1. Based on an expected normal operating rate indicated above.		
11	n-Hexane		2. DRE: 98 % operating at design conditions		
12	CO2		3. Burner Pressure Drop: Min. 0.10 oz/in2		
13	N2				
14	Helium				
15	H_2O				
16	C7				
17	C8				
18	C9				
19	C10				
20	C11+				
21	TOTAL				

	Other Components:	PPMV	Available Utilities:	
22	H2S		Fuel / Pilot Gas	Min. 30psig Natural Gas /Propane 40-50 SCFH
23	Benzene		Instrument Air	NA
24	Toluene		Power	120 V / 60 Hz or Solar Power
25	E-Benzene		Steam	NA
26	Xylene		Purge Gas	

DESIGN DATA

27	Ambient Temperatures:		Noise Performance Requirements:	Under 85 dBA
28	Low, °F	-20	Structural Design Code:	
29	High, °F	120	Wind Design Code:	ASCE
30	Design Conditions: Pressure/Temperature			
31	Max. Relative Humidity, %	90	Pressure/Speed	100 mph
32	Elevation (ASL), ft		Category	
33	Area Classification:	Class I Div 2	Seismic Design Code:	
34	Electrical Design Code:	NEC	Location	

EQUIPMENT SPECIFICATION

35	Type:	☐ Elevated ☑ Enclosed	Equipment Design:	
36		☐ Above Ground	Component	Material / Size / Rating / Other
37		☑ Stack ☐ Multiple Stack	Burner	
38		☐ Portable / Trailer	Burner Tip / Assist Gas Burner	304 SS
39			Burner Body	Carbon Steel
40	Smokeless By:	☐ Steam ☐ Assist Air	Pilot	
41		☐ Gas Assist ☑ Staging	Pilot Tip	304 SS
42			Pilot Line(s)	Carbon Steel
43	Stack:	☑ Self Supporting	Firebox / Stack	
44	Flare Burner:	☐ Non-Smokeless ☑ Smokeless ☐ Gas Assist	Shell	Carbon Steel
45	Pilot:	☑ Intermittent ☐ Continuous	Piping	Carbon Steel
46	Pilot Air Inspirator:	☑ Local ☐ Remote	Nozzles	Carbon Steel
47	Pilot Flame Control:	☐ No ☑ Yes (Thermocouple)	Flanges	Carbon Steel
48			Insulation	Blanket
49	Pilot Ignition:	☐ Flamefront Generator ☑ Inspirating Ignitor	Insulation Pins	304 SS
50		☐ Electronic ☑ Automatic ☐ Manual	Refractory	NA
51		☐ With Pilot Flame Control	Refractory Anchors	NA
52		☐ With Auto Pilot Re-Ignition	Ladders and Platforms	NA
53			Stack Sample Connections	Per EPA requirements
54	Pilot Ignition Backup:	☐ Manual Specify: i.e Piezo-Electric	Sight Glass	2
55		☐ Battery Pack	Other	

Environmental Control Equipment
Data Sheet

Item/Tag No.:		**Page**	2	of	3
Project No.:		**Revision:**	B		
Project:		**Date:**	27 February 2014		
		By:	JS		
P.O. No.:	-	**Checked:**	SG		
RFQ No.:	-	**Approved:**	MS		
Client:		**Ref. P&ID:**	-		
Site:		**Supplier:**	LEED FABRICATION		
Unit/Lease:		**Remarks:**	-	**Model No.:**	L30-0011-00

EQUIPMENT SPECIFICATION

Flame Detection: ☐ Thermocouple ☑ Ionization Rod ☐ UV Scanner

General Configuration:

Auxiliary Equipment	
Valves	NA
Blowers	NA
Dampers	NA
Inlet KO / Liquid Seal	NA
Flame / Detonation Arrestor	Yes
Instrumentation & Controls	
Solenoids / Shut-Off Valves	Check with Sales for available config.
Flow Meters	NA
Calorimeter	NA
Pressure Switches/Transmitters	NA
Thermocouples	Check with Sales for available config.
Temperature Switches/Transmitters	NA
BMS	Check with Sales for available config.
CEMS	NA
Other	NA

FABRICATION AND INSPECTION

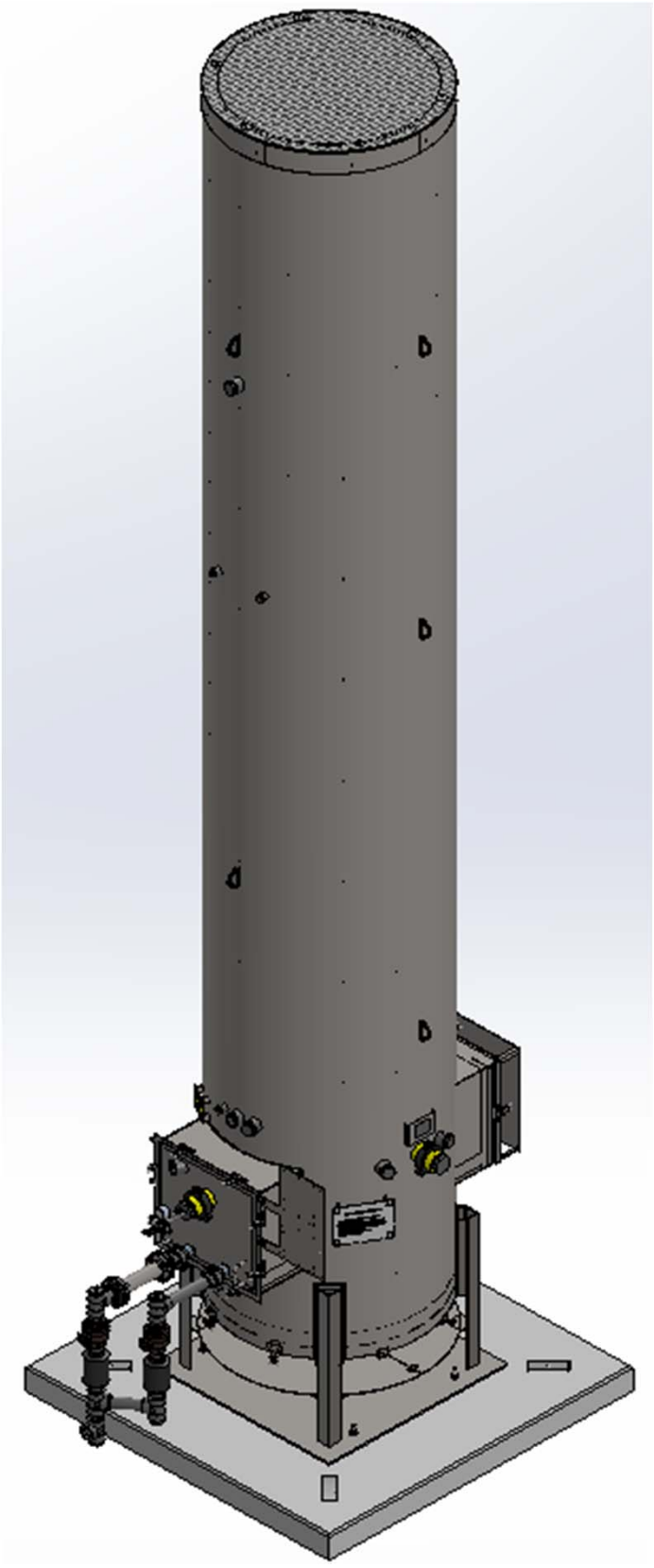
Special requirements	☐ Skid Mounted ☑ Concrete Pad ☐ Other
Inspection	☑ Vendor Standard ☐ Other. Specify:
Material Certification	☑ Vendor Standard ☐ MTR ☐ Certificate of Compliance ☐ Other (Specify):
NDE	☑ Vendor Standard ☐ Radiography. Specify: ☐ Ultrasonic. Specify: ☐ Liquid Penetrant. ☐ Magnetic Particles. ☐ PMI. Specify: ☐ Other. Specify:
Surface Preparation	☑ Vendor Standard ☐ Other. Specify:
Paint System	☑ Vendor Standard ☐ Other. Specify:
Finished Color	☑ Vendor Standard ☐ Other. Specify:

Equipment Info	
Component	**Weight / Dimensions**
Burner	
Burner Assembly	
Stack	
Stack Assembly	48 " OD x 25 ' H
Pilot Tip	
Pilot Line(s)	
Stack Assembly	
Auxiliary Equipment	
Blowers	
Inlet KO / Liquid Seal	
Flame / Detonation Arrestor	
Skid	
Instrumentation & Controls	
BMS	
Control Panel	

Additional Notes:

		Item/Tag No.:		Page	3	of	3
		Project No.:		Revision:	B		
		Project:		Date:	27 February 2014		
				By:	JS		
Environmental Control Equipment Data Sheet		P.O. No.:	-	Checked:	SG		
		RFQ No.:	-	Approved:	MS		
Client:		Ref. P&ID:	-				
Site:				Supplier:	LEED FABRICATION		
Unit/Lease:		Remarks:	-	Model No.:	L30-0011-00		

GENERAL ARRANGEMENT



§ MMBTU/hr values are calculated based on 1500 BTU/scf gas

Flare Size	# of Orifices (N)	Pressure (OZ/in^2)	m^3/s	mSCFD	MMBTU/hr
18	2	1	0.0021	6.34	0.39
18	2	2	0.0029	8.97	0.56
18	2	3	0.0036	10.99	0.68
18	2	4	0.0042	12.69	0.78
18	2	5	0.0046	14.18	0.88
18	2	6	0.0051	15.54	0.96
18	2	7	0.0055	16.78	1.04
18	2	8	0.0059	17.94	1.11
18	2	9	0.0062	19.03	1.18
18	2	10	0.0066	20.06	1.24
18	2	11	0.0069	21.04	1.30
18	2	12	0.0072	21.97	1.36
18	2	13	0.0075	22.87	1.42
18	2	14	0.0078	23.73	1.47
18	2	15	0.0081	24.57	1.52
18	2	16	0.0083	25.37	1.57
18	2	17	0.0086	26.15	1.62
18	2	18	0.0088	26.91	1.67
24	4	1	0.0042	12.69	0.78
24	4	2	0.0059	17.94	1.11
24	4	3	0.0072	21.97	1.36
24	4	4	0.0083	25.37	1.57
24	4	5	0.0093	28.37	1.76
24	4	6	0.0102	31.08	1.92
24	4	7	0.0110	33.56	2.08
24	4	8	0.0118	35.88	2.22
24	4	9	0.0125	38.06	2.35
24	4	10	0.0131	40.12	2.48
24	4	11	0.0138	42.08	2.60
24	4	12	0.0144	43.95	2.72
24	4	13	0.0150	45.74	2.83
24	4	14	0.0156	47.47	2.94
24	4	15	0.0161	49.13	3.04
24	4	16	0.0166	50.75	3.14
24	4	17	0.0171	52.31	3.24
24	4	18	0.0176	53.82	3.33
36	10	1	0.0104	31.72	1.96
36	10	2	0.0147	44.85	2.78
36	10	3	0.0180	54.93	3.40

36	10	4	0.0208	63.43	3.92
36	10	5	0.0232	70.92	4.39
36	10	6	0.0255	77.69	4.81
36	10	7	0.0275	83.91	5.19
36	10	8	0.0294	89.71	5.55
36	10	9	0.0312	95.15	5.89
36	10	10	0.0329	100.29	6.21
36	10	11	0.0345	105.19	6.51
36	10	12	0.0360	109.87	6.80
36	10	13	0.0375	114.35	7.08
36	10	14	0.0389	118.67	7.34
36	10	15	0.0403	122.83	7.60
36	10	16	0.0416	126.86	7.85
36	10	17	0.0429	130.77	8.09
36	10	18	0.0441	134.56	8.33
48	14	1	0.0146	44.40	2.75
48	14	2	0.0206	62.79	3.89
48	14	3	0.0252	76.91	4.76
48	14	4	0.0291	88.80	5.49
48	14	5	0.0325	99.29	6.14
48	14	6	0.0356	108.76	6.73
48	14	7	0.0385	117.48	7.27
48	14	8	0.0412	125.59	7.77
48	14	9	0.0437	133.21	8.24
48	14	10	0.0460	140.41	8.69
48	14	11	0.0483	147.27	9.11
48	14	12	0.0504	153.81	9.52
48	14	13	0.0525	160.09	9.91
48	14	14	0.0545	166.14	10.28
48	14	15	0.0564	171.97	10.64
48	14	16	0.0582	177.61	10.99
48	14	17	0.0600	183.07	11.33
48	14	18	0.0617	188.38	11.66

AEREON

16310 BRATTON LANE | BUILDING 3 #350 | AUSTIN, TX 78728

PGF-3000 CAPACITY LETTER

Dear Mr. Chris Rossman:

Aereon has provided PGF-3000 elevated flares to handle 1 – 3 MMSCFD for Noble Energy's PEN 1, PEN 2, OXF 1, and SHL 1 well pads.

The exit nozzle on each of these flares shall be retrofitted to allow a smaller flowrate to be flared at higher backpressure.

The new nozzle design will allow for the following design conditions:

Maximum Flowrate:	394,000 SCFD
Flare Pressure Drop at design flowrate:	30 psig
Smokeless Flowrate:	394,000 SCFD
Gas Lower Heating Value (LHV):	1,600 Btu/SCF
Total Heat Release at design flowrate:	26.2 MMBtu/hr

Please contact the undersigned with any questions.

Sincerely,

MThakar

Mirage Thakar
Manager of Applications Engineering
Austin, Texas
February 17, 2017

ATTACHMENT T

Emission Calculations

ATTACHMENT T – EMISSIONS CALCULATIONS

Provide detailed potential to emit (PTE) emission calculations for criteria and hazardous air pollutants (HAPs) for each emission point identified in the application. For hazardous air pollutants and volatile organic compounds (VOCs), the speciated emission calculations must be included.

Use the following guidelines to ensure complete emission calculations:

- All emission sources and fugitive emissions are included in the emission calculations, as well as all methods used to calculate the emissions.
- Proper emission point identification numbers and APCD and ERD identification numbers are used consistently in the emission calculations that are used throughout the application.
- A printout of the emission summary sheets is attached to the registration application.
- Printouts of any modeling must be included with the emission calculations. The modeling printout must show all inputs/outputs or assumptions that the modeled emissions are based upon.
- If emissions are provided from the manufacturer, the manufacturer's documentation and/or certified emissions must also be included.
- The emission calculations results must match the emissions provided on the emissions summary sheet.
- If calculations are based on a compositional analysis of the gas, attach the laboratory analysis. Include the following information: the location that the sample was taken (and whether the sample was taken from the actual site or a representative site); the date the sample was taken; and, if the sample is considered representative, the reasons that it is considered representative (same gas field, same formation and depth, distance from actual site, etc.).
- Provide any additional clarification as necessary. Additional clarification or information is especially helpful when reviewing modeling calculations to assist the engineer in understanding the basis of assumptions and/or inputs.

Please follow specific guidance provided on the emissions summary sheet when providing the calculations.

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Facility-Wide Emission Summary - Controlled

Wells	9	per pad
Storage Tanks	9	per pad
Sand Separator Tank	0	per pad
GPU Heaters	9	per pad
Low Pressure Heater	1	per pad
TEGs	1	per pad
High Pressure Separator	9	per pad
Low Pressure Separator	1	per pad
Vapor Recovery Unit	0	per pad
Tank Combustor	2	per pad
Emergency Generator	0	per pad
Length of lease road	1,650	feet

Carbon equivalent emissions (CO_2e) are based on the following Global Warming Potentials (GWP) from 40 CFR Part 98, Table A-1:

CO_2	1
CH_4	25
N_2O	298

Emission Point ID #	Emission Source ID#s	Emission Source Description	NO_X		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		CH_4		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
8E-COMB	1STK5-8, 2STK1-4,13S-TK9	Storage Vessels	---	---	---	---	3.25	14.23	---	---	---	---	---	---	0.45	1.98	11.33	49.61
8E-COMB	6S-TL1, 7S-TL2, 14S-TL3	Captured Liquid Loading	---	---	---	---	0.67	0.18	---	---	---	---	---	---	---	---	---	---
8E-COMB	8S-COMB	LEED Vapor Combustor Unit	0.86	3.75	0.72	3.15	2.7E-04	1.2E-03	0.01	0.02	0.07	0.29	0.07	0.29	0.00	0.00	1,023.13	4,481.29
10E-COMB	10S-COMB	NOV Flare	1.79	7.83	8.15	35.68	0.05	0.22	---	---	---	---	---	---	0.00	0.00	3,075.82	13,472.11
4E-GPU1	4S-GPU1	GPU Heater - 1.0 MMBtu/hr	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU2	4S-GPU2	GPU Heater - 1.0 MMBtu/hr	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU3	4S-GPU3	GPU Heater - 1.0 MMBtu/hr	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU4	4S-GPU4	GPU Heater - 1.0 MMBtu/hr	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU5	4S-GPU5	GPU Heater - 1.0 MMBtu/hr	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU6	4S-GPU6	GPU Heater - 1.0 MMBtu/hr	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU7	4S-GPU7	GPU Heater - 1.0 MMBtu/hr	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU8	4S-GPU8	GPU Heater - 1.0 MMBtu/hr	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU9	4S-GPU9	GPU Heater - 1.0 MMBtu/hr	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
5E-LP	5S-LP	Low Pressure Separator Heater	0.06	0.26	0.05	0.22	3.3E-03	0.01	3.6E-04	1.6E-03	4.6E-03	0.02	4.6E-03	0.02	0.00	0.01	87.84	384.73
12E-TEGEN	12S-TEGEN	Thermoelectric Generator	7.8E-04	3.4E-03	4.5E-04	2.0E-03	6.0E-05	2.6E-04	6.0E-06	2.6E-05	4.2E-05	1.8E-04	4.2E-05	1.8E-04	0.00	0.00	0.77	3.36
6E-TL1,6E-TL2	6S-TL1, 7S-TL2,14S-TL3	Uncaptured Liquid Loading	---	---	---	---	14.46	3.76	---	---	---	---	---	---	---	---	---	---
---	---	Fugitives	---	---	---	---	---	13.62	---	---	---	---	---	---	---	37.69	---	942.31
---	---	Haul Roads	---	---	---	---	---	---	---	---	---	2.07	---	0.21	---	---	---	---
Facility Total			3.43	15.00	9.52	41.70	18.48	32.19	0.01	0.04	0.12	2.62	0.12	0.75	0.47	39.77	5,252.95	23,950.21
Facility Total (excluding fugitive emissions)			3.43	15.00	9.52	41.70	18.48	18.57	0.01	0.04	0.12	0.55	0.12	0.55	0.47	2.08	5,252.95	23,007.90

[1]Combustor emissions (8S-COMB, 10S-COMB) include pilot emissions.

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Facility-Wide Emission Summary - Controlled

Emission Point ID #	Emission Source ID#s	Emission Source Description	Formaldehyde		Benzene		Toluene		Ethylbenzene		Xylenes		n-Hexane		Total BTEX		Total HAP	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
8E-COMB	1STK5-8, 2STK1-4,13S-TK9	Storage Vessels	---	---	1.8E-03	7.9E-03	1.1E-04	4.7E-04	2.1E-03	9.0E-03	2.2E-04	9.5E-04	0.01	0.06	4.2E-03	0.02	0.13	0.59
8E-COMB	6S-TL1, 7S-TL2, 14S-TL3	Captured Liquid Loading	---	---	5.9E-05	1.5E-05	6.2E-04	1.6E-04	2.6E-05	6.8E-06	1.4E-03	3.7E-04	2.4E-03	6.2E-04	2.1E-03	5.6E-04	0.03	0.01
8E-COMB	8S-COMB	LEED Vapor Combustor Unit	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10E-COMB	10S-COMB	NOV Flare	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4E-GPU1	4S-GPU1	GPU Heater - 1.0 MMBtu/hr	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	1.4E-03	0.01	4.4E-06	1.9E-05	1.5E-03	0.01
4E-GPU2	4S-GPU2	GPU Heater - 1.0 MMBtu/hr	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	1.4E-03	0.01	4.4E-06	1.9E-05	1.5E-03	0.01
4E-GPU3	4S-GPU3	GPU Heater - 1.0 MMBtu/hr	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	1.4E-03	0.01	4.4E-06	1.9E-05	1.5E-03	0.01
4E-GPU4	4S-GPU4	GPU Heater - 1.0 MMBtu/hr	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	1.4E-03	0.01	4.4E-06	1.9E-05	1.5E-03	0.01
4E-GPU5	4S-GPU5	GPU Heater - 1.0 MMBtu/hr	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	1.4E-03	0.01	4.4E-06	1.9E-05	1.5E-03	0.01
4E-GPU6	4S-GPU6	GPU Heater - 1.0 MMBtu/hr	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	1.4E-03	0.01	4.4E-06	1.9E-05	1.5E-03	0.01
4E-GPU7	4S-GPU7	GPU Heater - 1.0 MMBtu/hr	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	1.4E-03	0.01	4.4E-06	1.9E-05	1.5E-03	0.01
4E-GPU8	4S-GPU8	GPU Heater - 1.0 MMBtu/hr	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	1.4E-03	0.01	4.4E-06	1.9E-05	1.5E-03	0.01
4E-GPU9	4S-GPU9	GPU Heater - 1.0 MMBtu/hr	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	1.4E-03	0.01	4.4E-06	1.9E-05	1.5E-03	0.01
5E-LP	5S-LP	Low Pressure Separator Heater	4.5E-05	2.0E-04	1.3E-06	5.5E-06	2.0E-06	8.9E-06	---	---	---	---	1.1E-03	4.7E-03	3.3E-06	1.4E-05	1.1E-03	5.0E-03
12E-TEGEN	12S-TEGEN	Thermoelectric Generator	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6E-TL1,6E-TL2	6S-TL1, 7S-TL2,14S-TL3	Uncaptured Liquid Loading	---	---	1.3E-03	3.3E-04	0.01	3.4E-03	5.6E-04	1.5E-04	3.1E-02	8.0E-03	0.05	0.01	0.05	0.01	0.61	0.16
---	---	Fugitives	---	---	---	3.7E-03	---	0.01	---	<0.01	---	0.02	---	0.25	---	0.03	<0.01	0.46
---	---	Haul Roads	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Facility Total			5.9E-04	2.6E-03	3.1E-03	0.01	0.01	0.01	2.7E-03	9.2E-03	0.03	0.03	0.08	0.38	0.05	0.06	0.78	1.28
Facility Total (excluding fugitive emissions)			5.9E-04	2.6E-03	3.1E-03	0.01	1.4E-02	4.2E-03	2.7E-03	9.2E-03	3.2E-02	9.3E-03	0.08	0.13	0.05	0.03	0.78	0.82

[1]Combustor emissions (8S-COMB, 10S-COMB) include pilot emissions.

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Storage Vessels

Potential Throughput
Operational Hours 8,760 hrs/yr
Maximum Condensate Throughput[1] 452 bbl/day
Maximum Produced Water Throughput[1] 1,115 bbl/day

Overall Control Efficiency of Flare 98%

Storage Tanks - Uncontrolled

	Breathing		Working		Flashing		Total Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Methane	<0.001	<0.001	<0.001	<0.001	22.652	99.218	22.652	99.218
Ethane	<0.001	<0.001	<0.001	<0.001	26.772	117.260	26.772	117.260
Propane	0.237	1.037	0.691	3.029	46.124	202.025	47.053	206.091
i-Butane	0.054	0.236	0.154	0.674	15.600	68.329	15.808	69.240
n-Butane	0.134	0.588	0.381	1.668	40.961	179.408	41.476	181.665
i-Pentane	0.049	0.214	0.139	0.608	15.951	69.863	16.138	70.685
n-Pentane	0.055	0.240	0.156	0.683	17.489	76.604	17.700	77.526
2,2-Dimethylbutane	0.029	0.126	0.083	0.363	7.691	33.688	7.803	34.177
2,3-Dimethylbutane	0.002	0.007	0.005	0.020	0.398	1.742	0.404	1.769
2-Methylpentane	0.007	0.030	0.020	0.087	1.767	7.740	1.794	7.858
3-Methylpentane	0.004	0.019	0.012	0.054	1.047	4.587	1.064	4.659
n-Hexane	0.027	0.118	0.078	0.343	6.211	27.204	6.316	27.665
2,2-Dimethylpentane	1.5E-04	0.001	4.4E-04	0.002	0.030	0.133	0.031	0.135
Methylcyclopentane	0.001	0.004	0.003	0.011	0.222	0.974	0.226	0.989
Benzene	2.7E-04	0.001	0.001	0.004	0.111	0.487	0.112	0.492
Cyclohexane	0.003	0.011	0.007	0.033	0.633	2.772	0.643	2.816
2-Methylhexane	0.001	0.002	0.002	0.007	0.343	1.502	0.345	1.512
2,3-Dimethylpentane	3.9E-04	0.002	0.001	0.005	0.066	0.290	0.068	0.297
3-Methylhexane	0.001	0.006	0.004	0.018	0.226	0.990	0.232	1.014
1t,2-Dimethylcyclopentane	6.6E-05	2.9E-04	2.0E-04	0.001	0.011	0.049	0.011	0.050
1c,2-Dimethylcyclopentane	1.4E-05	6.2E-05	4.2E-05	1.8E-04	0.002	0.010	0.002	0.010
n-Heptane	0.024	0.104	0.071	0.311	3.547	15.535	3.642	15.951
Methylcyclohexane	0.001	0.004	0.002	0.011	0.118	0.518	0.122	0.532
2,5-Dimethylhexane	6.6E-05	2.9E-04	2.0E-04	0.001	0.008	0.034	0.008	0.035
2,4-Dimethylhexane	9.6E-05	4.2E-04	2.9E-04	0.001	0.012	0.051	0.012	0.052
Toluene	0.001	0.003	0.002	0.010	0.183	0.802	0.186	0.815
2-Methylheptane	2.1E-04	0.001	0.001	0.003	0.021	0.091	0.022	0.095
4-Methylheptane	1.2E-04	0.001	3.6E-04	0.002	0.011	0.050	0.012	0.052
3-Methylheptane	1.2E-04	0.001	3.7E-04	0.002	0.011	0.050	0.012	0.052
n-Octane	0.012	0.051	0.035	0.154	0.956	4.187	1.003	4.392
1c,2-Dimethylcyclohexane	8.3E-05	3.6E-04	2.5E-04	0.001	0.007	0.030	0.007	0.031
Ethylcyclohexane	1.5E-05	6.7E-05	4.6E-05	2.0E-04	0.002	0.010	0.002	0.011
Ethylbenzene	8.1E-05	3.6E-04	2.5E-04	0.001	0.011	0.048	0.011	0.049
m-Xylene	0.001	0.004	0.003	0.011	0.087	0.380	0.090	0.395
p-Xylene	3.6E-05	1.6E-04	1.1E-04	4.8E-04	0.005	0.023	0.005	0.023
n-Nonane	0.002	0.009	0.006	0.028	0.095	0.415	0.103	0.452
Decane	3.4E-04	0.002	0.001	0.005	0.009	0.041	0.011	0.047
Undecane	1.6E-04	0.001	5.0E-04	0.002	0.003	0.013	0.004	0.016
Total VOC Emissions:	0.64	2.82	1.86	8.15	159.97	700.67	162.48	711.65
Total HAP Emissions:	2.9E-02	0.13	0.08	0.37	6.61	28.95	6.72	29.45

[1] Uncontrolled emissions calculation using Promax (sum of produced water and condensate). Non-methane emissions are taken from the tank emissions stencil. Methane emissions are taken from the flash stream composition. Condensate and Produced Water throughputs are based on current permit limits

[2] Emissons from the condensate, produced water, and drip storage tanks will be primarily controlled by the vapor combustor unit (8S-COMB)

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Storage Vessels

Potential Throughput

Operational Hours 8,760 hrs/yr
Maximum Condensate Throughput[1] 452 bbl/day
Maximum Produced Water Throughput[1] 1,115 bbl/day

Overall Control Efficiency of Flare 98%

Storage Tanks - Controlled

	Breathing		Working		Flashing		Total Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Methane	<0.001	<0.001	<0.001	<0.001	0.453	1.984	0.453	1.984
Ethane	<0.001	<0.001	<0.001	<0.001	0.535	2.345	0.535	2.345
Propane	0.005	0.021	0.014	0.061	0.922	4.041	0.941	4.122
i-Butane	0.001	0.005	0.003	0.013	0.312	1.367	0.316	1.385
n-Butane	0.003	0.012	0.008	0.033	0.819	3.588	0.830	3.633
i-Pentane	0.001	0.004	0.003	0.012	0.319	1.397	0.323	1.414
n-Pentane	0.001	0.005	0.003	0.014	0.350	1.532	0.354	1.551
2,2-Dimethylbutane	0.001	0.003	0.002	0.007	0.154	0.674	0.156	0.684
2,3-Dimethylbutane	3.2E-05	1.4E-04	9.1E-05	4.0E-04	0.008	0.035	0.008	0.035
2-Methylpentane	1.4E-04	0.001	4.0E-04	0.002	0.035	0.155	0.036	0.157
3-Methylpentane	8.5E-05	3.7E-04	2.5E-04	0.001	0.021	0.092	0.021	0.093
n-Hexane	0.001	0.002	0.002	0.007	0.124	0.544	0.126	0.553
2,2-Dimethylpentane	3.0E-06	1.3E-05	8.8E-06	3.9E-05	0.001	0.003	0.001	0.003
Methylcyclopentane	1.7E-05	7.6E-05	5.1E-05	2.2E-04	0.004	0.019	0.005	0.020
Benzene	5.5E-06	2.4E-05	1.6E-05	7.0E-05	0.002	0.010	0.002	0.010
Cyclohexane	5.1E-05	2.2E-04	1.5E-04	0.001	0.013	0.055	0.013	0.056
2-Methylhexane	1.1E-05	4.8E-05	3.2E-05	1.4E-04	0.007	0.030	0.007	0.030
2,3-Dimethylpentane	7.7E-06	3.4E-05	2.3E-05	1.0E-04	0.001	0.006	0.001	0.006
3-Methylhexane	2.8E-05	1.2E-04	8.2E-05	3.6E-04	0.005	0.020	0.005	0.020
1t,2-Dimethylcyclopentane	1.3E-06	5.8E-06	3.9E-06	1.7E-05	2.2E-04	0.001	2.3E-04	0.001
1c,2-Dimethylcyclopentane	2.8E-07	1.2E-06	8.4E-07	3.7E-06	4.4E-05	1.9E-04	4.5E-05	2.0E-04
n-Heptane	4.8E-04	0.002	0.001	0.006	0.071	0.311	0.073	0.319
Methylcyclohexane	1.7E-05	7.3E-05	4.9E-05	2.2E-04	0.002	0.010	0.002	0.011
2,5-Dimethylhexane	1.3E-06	5.7E-06	3.9E-06	1.7E-05	1.5E-04	0.001	1.6E-04	0.001
2,4-Dimethylhexane	1.9E-06	8.4E-06	5.8E-06	2.5E-05	2.3E-04	0.001	2.4E-04	0.001
Toluene	1.5E-05	6.6E-05	4.5E-05	2.0E-04	0.004	0.016	0.004	0.016
2-Methylheptane	4.3E-06	1.9E-05	1.3E-05	5.6E-05	4.1E-04	0.002	4.3E-04	0.002
4-Methylheptane	2.4E-06	1.0E-05	7.2E-06	3.2E-05	2.3E-04	0.001	2.4E-04	0.001
3-Methylheptane	2.4E-06	1.1E-05	7.3E-06	3.2E-05	2.3E-04	0.001	2.4E-04	0.001
n-Octane	2.3E-04	0.001	0.001	0.003	0.019	0.084	0.020	0.088
1c,2-Dimethylcyclohexane	1.7E-06	7.2E-06	5.0E-06	2.2E-05	1.4E-04	0.001	1.4E-04	0.001
Ethylcyclohexane	3.0E-07	1.3E-06	9.2E-07	4.0E-06	4.7E-05	2.1E-04	4.9E-05	2.1E-04
Ethylbenzene	1.6E-06	7.1E-06	4.9E-06	2.2E-05	2.2E-04	0.001	2.2E-04	0.001
m-Xylene	1.7E-05	7.5E-05	5.2E-05	2.3E-04	0.002	0.008	0.002	0.008
p-Xylene	7.3E-07	3.2E-06	2.2E-06	9.6E-06	1.0E-04	4.5E-04	1.1E-04	4.7E-04
n-Nonane	4.2E-05	1.9E-04	1.3E-04	0.001	0.002	0.008	0.002	0.009
Decane	6.9E-06	3.0E-05	2.1E-05	9.2E-05	1.9E-04	0.001	2.2E-04	0.001
Undecane	3.3E-06	1.4E-05	1.0E-05	4.4E-05	5.8E-05	2.6E-04	7.2E-05	3.1E-04
Total VOC Emissions:	0.01	0.06	0.04	0.16	3.20	14.01	3.25	14.23
Total HAP Emissions:	0.00	0.00	0.00	0.01	0.13	0.58	0.13	0.59

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

GPU Heaters

Source Designation:	**4S-GPU1 to 4S-GPU9**
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,249
Heat Input (MMBtu/hr)	1.00
Fuel Consumption (MMscf/hr):	8.01E-04
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf)[1, 4]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
NO_x	100	0.08	0.35
CO	84	0.07	0.29
VOC	5.5	4.4E-03	0.02
SO_2	0.6	4.8E-04	2.1E-03
PM Total	7.6	0.01	0.03
PM Condensable	5.7	4.6E-03	0.02
PM_{10} (Filterable)	1.9	1.5E-03	0.01
$PM_{2.5}$ (Filterable)	1.9	1.5E-03	0.01
Lead	5.00E-04	4.0E-07	1.8E-06
CO_2	117.0	117.00	512.45
CH_4	2.21E-03	2.2E-03	9.7E-03
N_2O	2.21E-04	2.2E-04	9.7E-04

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf)[1]	Potential Emissions (lb/hr)[2]	Potential Emissions (tons/yr)[3]
HAPs:			
2-Methylnaphthalene	2.4E-05	1.9E-08	8.4E-08
3-Methylchloranthrene	1.8E-06	1.4E-09	6.3E-09
7,12-Dimethylbenz(a)anthracene	1.6E-05	1.3E-08	5.6E-08
Acenaphthene	1.8E-06	1.4E-09	6.3E-09
Acenaphthylene	1.8E-06	1.4E-09	6.3E-09
Anthracene	2.4E-06	1.9E-09	8.4E-09
Benz(a)anthracene	1.8E-06	1.4E-09	6.3E-09
Benzene	2.1E-03	1.7E-06	7.4E-06
Benzo(a)pyrene	1.2E-06	9.6E-10	4.2E-09
Benzo(b)fluoranthene	1.8E-06	1.4E-09	6.3E-09
Benzo(g,h,i)perylene	1.2E-06	9.6E-10	4.2E-09
Benzo(k)fluoranthene	1.8E-06	1.4E-09	6.3E-09
Chrysene	1.8E-06	1.4E-09	6.3E-09
Dibenzo(a,h) anthracene	1.2E-06	9.6E-10	4.2E-09
Dichlorobenzene	1.2E-03	9.6E-07	4.2E-06
Fluoranthene	3.0E-06	2.4E-09	1.1E-08
Fluorene	2.8E-06	2.2E-09	9.8E-09
Formaldehyde	7.5E-02	6.0E-05	2.6E-04
Hexane	1.8E+00	1.4E-03	6.3E-03
Indo(1,2,3-cd)pyrene	1.8E-06	1.4E-09	6.3E-09
Naphthalene	6.1E-04	4.9E-07	2.1E-06
Phenanthrene	1.7E-05	1.4E-08	6.0E-08
Pyrene	5.0E-06	4.0E-09	1.8E-08
Toluene	3.4E-03	2.7E-06	1.2E-05
Arsenic	2.0E-04	1.6E-07	7.0E-07
Beryllium	1.2E-05	9.6E-09	4.2E-08
Cadmium	1.1E-03	8.8E-07	3.9E-06
Chromium	1.4E-03	1.1E-06	4.9E-06
Cobalt	8.4E-05	6.7E-08	2.9E-07
Manganese	3.8E-04	3.0E-07	1.3E-06
Mercury	2.6E-04	2.1E-07	9.1E-07
Nickel	2.1E-03	1.7E-06	7.4E-06
Selenium	2.4E-05	1.9E-08	8.4E-08
Total HAP		**1.5E-03**	**6.6E-03**

[1] Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

[2] Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

[3] Annual Emissions $(tons/yr)_{Potential}$ = $(lb/hr)_{Emissions}$ × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

[4] GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Low Pressure Separator Heater

Source Designation:	**5S-LP**
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,249
Heat Input (MMBtu/hr)	0.75
Fuel Consumption (MMscf/hr):	6.01E-04
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf)[1, 4]	Potential Emissions	
		(lb/hr)[2]	(tons/yr)[3]
NO_x	100	0.06	0.26
CO	84	0.05	0.22
VOC	5.5	3.3E-03	0.01
SO_2	0.6	3.6E-04	1.6E-03
PM Total	7.6	4.6E-03	0.02
PM Condensable	5.7	3.4E-03	0.01
PM_{10} (Filterable)	1.9	1.1E-03	5.0E-03
$PM_{2.5}$ (Filterable)	1.9	1.1E-03	5.0E-03
Lead	5.00E-04	3.0E-07	1.3E-06
CO_2	117.0	87.75	384.34
CH_4	2.21E-03	1.7E-03	7.2E-03
N_2O	2.21E-04	1.7E-04	7.2E-04

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf)[1]	Potential Emissions	
		(lb/hr)[2]	(tons/yr)[3]
HAPs:			
2-Methylnaphthalene	2.4E-05	1.4E-08	6.3E-08
3-Methylchloranthrene	1.8E-06	1.1E-09	4.7E-09
7,12-Dimethylbenz(a)anthracene	1.6E-05	9.6E-09	4.2E-08
Acenaphthene	1.8E-06	1.1E-09	4.7E-09
Acenaphthylene	1.8E-06	1.1E-09	4.7E-09
Anthracene	2.4E-06	1.4E-09	6.3E-09
Benz(a)anthracene	1.8E-06	1.1E-09	4.7E-09
Benzene	2.1E-03	1.3E-06	5.5E-06
Benzo(a)pyrene	1.2E-06	7.2E-10	3.2E-09
Benzo(b)fluoranthene	1.8E-06	1.1E-09	4.7E-09
Benzo(g,h,i)perylene	1.2E-06	7.2E-10	3.2E-09
Benzo(k)fluoranthene	1.8E-06	1.1E-09	4.7E-09
Chrysene	1.8E-06	1.1E-09	4.7E-09
Dibenzo(a,h) anthracene	1.2E-06	7.2E-10	3.2E-09
Dichlorobenzene	1.2E-03	7.2E-07	3.2E-06
Fluoranthene	3.0E-06	1.8E-09	7.9E-09
Fluorene	2.8E-06	1.7E-09	7.4E-09
Formaldehyde	7.5E-02	4.5E-05	2.0E-04
Hexane	1.8E+00	1.1E-03	4.7E-03
Indo(1,2,3-cd)pyrene	1.8E-06	1.1E-09	4.7E-09
Naphthalene	6.1E-04	3.7E-07	1.6E-06
Phenanthrene	1.7E-05	1.0E-08	4.5E-08
Pyrene	5.0E-06	3.0E-09	1.3E-08
Toluene	3.4E-03	2.0E-06	8.9E-06
Arsenic	2.0E-04	1.2E-07	5.3E-07
Beryllium	1.2E-05	7.2E-09	3.2E-08
Cadmium	1.1E-03	6.6E-07	2.9E-06
Chromium	1.4E-03	8.4E-07	3.7E-06
Cobalt	8.4E-05	5.0E-08	2.2E-07
Manganese	3.8E-04	2.3E-07	1.0E-06
Mercury	2.6E-04	1.6E-07	6.8E-07
Nickel	2.1E-03	1.3E-06	5.5E-06
Selenium	2.4E-05	1.4E-08	6.3E-08
Total HAP		**1.1E-03**	**5.0E-03**

[1] Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

[2] Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

[3] Annual Emissions $(tons/yr)_{Potential}$ = $(lb/hr)_{Emissions}$ × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

[4] GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Thermoelectric Generator

Source Designation:	**12S-TEGEN**
Fuel Used:	Propane
Fuel Consumption (gal/day):	1.4
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor ($lb/10^3$ gal)[1, 4]	Potential Emissions	
		(lb/hr)[2]	(tons/yr)[3]
NO_x	13.00	7.8E-04	3.4E-03
CO	7.50	4.5E-04	2.0E-03
VOC	1.00	6.0E-05	2.6E-04
SO_2	0.10	6.0E-06	2.6E-05
PM Total	0.70	4.2E-05	1.8E-04
PM Condensable	0.50	3.0E-05	1.3E-04
PM_{10} (Filterable)	0.20	1.2E-05	5.3E-05
$PM_{2.5}$ (Filterable)	0.20	1.2E-05	5.3E-05
CO_2	12500.00	0.75	3.29
CH_4	0.20	1.2E-05	5.3E-05
N_2O	0.90	5.4E-05	2.4E-04

[1] Emission factors from AP-42 Section 1.5 "LPG Combustion" Tables 1.5-1

[2] Emission Rate (lb/hr) = Rated Capacity (gal/day) Emission Factor ($lb/10^3$ gal) X Rated Capacity (gal/day) X day/24 hrs

[3] Annual Emissions $(tons/yr)_{Potential}$ = $(lb/hr)_{Emissions}$ × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

[4] GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Tank Combustor

Source Designation:	**8S-COMB , 9S-PILOT1**
Pilot Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,249
Pilot Rating (MMBtu/hr)	0.05
Combustor Rating (MMBtu/hr)[1]	8.69
Waste Gas Flow Rate (scf/hr)	5,833
Pilot Fuel Consumption (scf/hr):	40.0
Potential Annual Hours of Operation (hr/yr):	8,760

[1] Maximum gas flow rate for 48" model from Leed Enclosed Combustor Operations spec sheet

Enclosed Combustor Emissions

Pollutant	Emission Factors [2] (lb/MMBtu)	Combustor (lb/hr)	Combustor (tpy)	Pilot (lb/hr)	Pilot (tpy)	Total (lb/hr)	Total (tpy)
NO_x	0.10	0.85	3.73	4.9E-03	0.02	0.86	3.75
CO	0.08	0.72	3.13	4.1E-03	0.02	0.72	3.15
VOC	5.4E-03	---	---	2.7E-04	1.2E-03	0.00	0.00
SO_2	5.9E-04	0.01	0.02	2.9E-05	1.3E-04	0.01	0.02
PM/PM_{10}	0.01	0.06	0.28	3.7E-04	1.6E-03	0.07	0.29
CO_2	117.00	1016.707	4453.175	5.84	25.59	1022.55	4478.77
CH_4	2.2E-03	---	---	1.1E-04	4.8E-04	0.00	0.00
N_2O	2.2E-04	1.9E-03	0.01	1.1E-05	4.8E-05	1.9E-03	0.01

[2] Emission factors from AP-42 Ch. 1.4 for natural gas combustion were used as they were determined to be most representative of the process. Ch. 5.3 (Natural Gas Processing) was consulted, however, factors contained there are appropriate for amine gas sweetening processes, which is not the case at the wellpad. Also, Ch. 13.5 (Industrial Flares) was consulted, but since the control device in this case is an enclosed combustor vs. an elevated flare, these factors were also determined to be inappropriate.

Combustor Maximum Loading:

$$\frac{\frac{5833\ scf}{hr} \times \frac{lb\text{-}mol}{379.5\ scf} \times \frac{20.51\ lb}{lb\text{-}mol}}{} = 315.27\ lb/hr$$

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

NOV Flare

Source Designation:	**10S-COMB, 11S-PILOT**
Pilot Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,249
Pilot Rating (MMBtu/hr)	0.07
Combustor Rating (MMBtu/hr)[1]	26.2
Waste Gas Flow Rate (scf/hr)[1]	16,417
Pilot Fuel Consumption (scf/hr):	60
Potential Annual Hours of Operation (hr/yr):	8,760

[1] Based on Flare Design Orfice Specifications of 394 MSCFD @ 1600 Btu/scf

Enclosed Combustor Emissions

Pollutant	Emission Factors [2] (lb/MMBtu)	Combustor (lb/hr)	Combustor (tpy)	Pilot (lb/hr)	Pilot (tpy)	Total (lb/hr)	Total (tpy)
NO_x	0.07	1.78	7.80	5.1E-03	0.02	1.79	7.83
CO	0.31	8.12	35.57	2.3E-02	0.10	8.15	35.68
VOC	6.6E-01	---	---	4.9E-02	0.22	0.05	0.22
CO_2	117.00	3065.329	13426.1	8.76	38.39	3074.09	13464.53
CH_4	2.2E-03	---	---	1.7E-04	7.2E-04	0.00	0.00
N_2O	2.2E-04	5.8E-03	0.03	1.7E-05	7.2E-05	5.8E-03	0.03

[2] Emission factors from AP-42 Ch. 13.5 for industrial flares were used as they were determined to be most representative of the process.

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Liquid Loading

Throughput 24,019,519 gal/yr
Capture Efficiency 70% non-tested tanker trucks
Control Efficiency 98% Combustor destruction efficiency

Liquid Loading Emissions

	Uncontrolled Emissions		Uncaptured Emissions		Controlled Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Propane	16.509	4.292	4.953	1.288	0.231	0.060
i-Butane	4.328	1.125	1.299	0.338	0.061	0.016
n-Butane	11.150	2.899	3.345	0.870	0.156	0.041
i-Pentane	3.990	1.038	1.197	0.311	0.056	0.015
n-Pentane	4.423	1.150	1.327	0.345	0.062	0.016
2,2-Dimethylbutane	2.204	0.573	0.661	0.172	0.031	0.008
2,3-Dimethylbutane	0.117	0.030	0.035	0.009	0.002	4.24E-04
2-Methylpentane	0.506	0.132	0.152	0.039	0.007	0.002
3-Methylpentane	0.307	0.080	0.092	0.024	0.004	0.001
n-Hexane	1.903	0.495	0.571	0.148	0.027	0.007
2,2-Dimethylpentane	0.010	0.003	0.003	0.001	1.40E-04	3.64E-05
Methylcyclopentane	0.061	0.016	0.018	0.005	0.001	2.21E-04
Benzene	0.019	0.005	0.006	0.001	2.67E-04	6.95E-05
Cyclohexane	0.170	0.044	0.051	0.013	0.002	0.001
2-Methylhexane	0.034	0.009	0.010	0.003	4.80E-04	1.25E-04
2,3-Dimethylpentane	0.024	0.006	0.007	0.002	3.41E-04	8.86E-05
3-Methylhexane	0.086	0.022	0.026	0.007	0.001	3.14E-04
1t,2-Dimethylcyclopentane	0.004	0.001	0.001	3.23E-04	5.80E-05	1.51E-05
1c,2-Dimethylcyclopentane	0.001	2.20E-04	2.54E-04	6.61E-05	1.19E-05	3.08E-06
n-Heptane	1.432	0.372	0.429	0.112	0.020	0.005
Methylcyclohexane	0.049	0.013	0.015	0.004	0.001	1.80E-04
2,5-Dimethylhexane	0.004	0.001	0.001	2.90E-04	5.20E-05	1.35E-05
2,4-Dimethylhexane	0.005	0.001	0.002	4.24E-04	7.61E-05	1.98E-05
Toluene	0.044	0.011	0.013	0.003	0.001	1.60E-04
2-Methylheptane	0.012	0.003	0.003	0.001	1.62E-04	4.21E-05
4-Methylheptane	0.006	0.002	0.002	0.001	9.10E-05	2.37E-05
3-Methylheptane	0.007	0.002	0.002	0.001	9.19E-05	2.39E-05
n-Octane	0.609	0.158	0.183	0.048	0.009	0.002
1c,2-Dimethylcyclohexane	0.004	0.001	0.001	3.37E-04	6.05E-05	1.57E-05
Ethylcyclohexane	0.001	2.12E-04	2.45E-04	6.36E-05	1.14E-05	2.97E-06
Ethylbenzene	0.004	0.001	0.001	3.28E-04	5.89E-05	1.53E-05
m-Xylene	0.044	0.011	0.013	0.003	0.001	1.61E-04
p-Xylene	0.002	4.86E-04	0.001	1.46E-04	2.62E-05	6.80E-06
n-Nonane	0.103	0.027	0.031	0.008	0.001	3.74E-04
Decane	0.016	0.004	0.005	0.001	2.23E-04	5.81E-05
Undecane	0.007	0.002	0.002	0.001	1.04E-04	2.70E-05
Total VOC Emissions:	48.20	12.53	14.46	3.76	0.67	0.18
Total HAP Emissions:	2.02	0.52	0.61	0.16	0.03	0.01

[1] Uncontrolled emissions calculation using Promax (sum of produced water and condensate).
[2] Hourly emissions assume two hours of loading per day, five days per week.
[3] Liquid loading throughput is based on the sum of the condensate loading throughput and produced water throughput at the wellpad.

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Fugitive Emissions

Fugitive Emissions from Component Leaks

Facility Equipment Type[1]	Valves	Connectors	Open-Ended Lines	Pressure Relief Devices
Wellhead	8	38	0.5	0
Separators	1	6	0	0
Meters/Piping	12	45	0	0
Compressors	12	57	0	0
In-line heaters	14	65	2	1
Dehydrators	24	90	2	2

[1] Table W-1B to Subpart W of Part 98 —Default Average Component Counts for Major Onshore Natural Gas Production

Fugitive VOC/Total Emissions from Component Leaks

Equipment Type	Service	Emission Factors[1] (kg/hr/source)	Facility Equipment Count[2] (units)	TOC Annual Fugitive Emissions (tpy)	Weight Fraction VOC	Weight Fraction HAP	VOC Emissions[3] (tpy)	HAP Emissions[3] (tpy)
Pumps	Light Oil	3.20E-05	14	0.00	1.00	0.03	4.2E-03	1.4E-04
Valves	Gas	4.50E-03	495	21.51	0.17	0.01	3.60	0.12
Pressure Relief Valves	Gas	8.80E-03	33	2.80	0.17	0.01	0.47	0.02
Open-Ended Lines	All	2.00E-03	38	0.72	0.17	0.01	0.12	4.1E-03
Flanges	Gas	3.90E-04	1093	4.12	0.17	0.01	0.69	0.02
Connectors	All	2.00E-04	2,186	4.22	0.17	0.01	0.71	0.02
Intermittent Pneumatic Devices[4]	Gas	13.5	45	---	---	---	8.03	0.27
			Emission Totals:	**33.38**	**---**	**---**	**13.62**	**0.46**

[1] U.S. EPA. Office of Air Quality Planning and Standards. *Protocol for Equipment Leak Emission Estimates.* Table 2-4. (Research Triangle Park, NC: U.S. EPA EPA-453/R-95-017, 1995). The pneumatic equipment values are from 40 CFR 98 Subpart W, Table W-1A (units of scf/hr/component). Pneumatic controller assumes operation 1/3 of the year.

[2] Assumes one pump for each tank and one meter per wellhead. Pressure relief valves count includes one Emergency Pressure Relief valve and one lock-down hatch for each storage tank. Pneumatic devices assume 5 per well. A 50% compliance margin is added to the component counts based on Subpart W counts.

[3] Potential emissions VOC/HAP (tpy) = Emission factor (kg/hr/source) * Number of Sources * Weight % VOC/HAP x 2.2046 (lb/kg) x 8,760 (hr/yr) ÷ 2,000 (lb/ton

[4] Potential emissions VOC/HAP (tpy) = Gas volume vented (scf/yr) * Molar weight of natural gas (lb/lb-mol) * Weight % VOC/HAP ÷ 100 ÷ 379 (scf/lb-mol) ÷ 2,000 (lb/ton)

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Fugitive Emissions

Fugitive Specific HAP Emissions from Component Leaks

Equipment Type	Service	Emission Factors[1] (kg/hr/source)	Facility Equipment Count[2] (units)	TOC Annual Fugitive Emissions (tpy)	Benzene Emissions[3] (tpy)	Toluene Emissions[3] (tpy)	Ethylbenzene Emissions[3] (tpy)	Xylene Emissions[3] (tpy)	n-Hexane Emissions[4] (tpy)
Pumps	Light Oil	3.20E-05	14	0.00	1.9E-07	5.2E-07	<0.01	9.1E-07	1.3E-05
Valves	Gas	4.50E-03	495	21.51	9.8E-04	2.7E-03	<0.01	4.7E-03	0.07
Pressure Relief Valves	Gas	8.80E-03	33	2.80	1.3E-04	3.5E-04	<0.01	6.1E-04	0.01
Open-Ended Lines	All	2.00E-03	38	0.72	3.3E-05	9.1E-05	<0.01	1.6E-04	2.3E-03
Flanges	Gas	3.90E-04	1093	4.12	1.9E-04	5.2E-04	<0.01	8.9E-04	0.01
Connectors	All	2.00E-04	2,186	4.22	1.9E-04	5.3E-04	<0.01	9.2E-04	0.01
Intermittent Pneumatic Devices[4]	Gas	13.5	45	---	2.2E-03	0.01	<0.01	0.01	0.15
			Emission Totals:	**33.38**	**3.7E-03**	**0.01**	**<0.01**	**0.02**	**0.25**

[1] U.S. EPA. Office of Air Quality Planning and Standards. *Protocol for Equipment Leak Emission Estimates.* Table 2-4. (Research Triangle Park, NC: U.S. EPA EPA-453/R-95-017, 1995). The pneumatic equipment values are from 40 CFR 98 Subpart W, Table W-1A (units of scf/hr/component). Pneumatic controller assumes operation 1/3 of the year.

[2] Assumes one pump for each tank and one meter per wellhead. Pressure relief valves count includes one Emergency Pressure Relief valve and one lock-down hatch for each storage tank. Pneumatic devices assume 5 per well. A 50% compliance margin is added to the component counts based on Subpart W counts.

[3] Potential emissions HAP (tpy) = Emission factor (kg/hr/source) * Number of Sources * Weight % HAP x 2.2046 (lb/kg) x 8,760 (hr/yr) ÷ 2,000 (lb/ton)

[4] Potential emissions HAP (tpy) = Gas volume vented (scf/yr) * Molar weight of natural gas (lb/lb-mol) * Weight % HAP ÷ 100 ÷ 379 (scf/lb-mol) ÷ 2,000 (lb/ton)

GHG Fugitive Emissions from Component Leaks

Component	Component Count	GHG Emission Factor[1] (scf/hr/component)	CH_4 Emissions[2,3] (tpy)	CO_2 Emissions[2,3] (tpy)	CO_2e Emissions[4] (tpy)
Pumps	14	0.01	0.02	8.4E-05	0.49
Valves	495	0.027	1.95	0.01	48.64
Pressure Relief Devices	33	0.04	0.19	8.2E-04	4.80
Open-Ended Lines	38	0.061	0.33	1.4E-03	8.32
Flanges	1,093	0.03	4.77	0.02	119.30
Connectors	2,186	0.003	0.95	4.1E-03	23.86
Intermittent Pneumatic Devices	45	13.5	29.47	0.13	736.90
Total			**37.69**	**0.16**	**942.31**

[1] Population emission factors for gas service in the Eastern U.S. from *Table W-1A of Subpart W - Default Whole Gas Emission Factors for Onshore Production* , 40 CFR 98, Subpart W (table W-6 for compressor). Pneumatic assumes operation 1/3 of the year.

[2] Calculated in accordance with Equations W-32a, W-35 and W-36 in Subpart W of 40 CFR 98. See footnote 4 above for sample calculation.

[3] Potential emissions VOC/HAP (tpy) = Gas volume vented (scf/yr) * Molar weight of natural gas (lb/lb-mol) * Weight % VOC/HAP ÷ 100 ÷ 379 (scf/lb-mol) ÷ 2,000 (lb/ton)
Mole fractions of CH_4 and CO_2 based on gas analysis:
CH_4: 78% CO_2: 0.12%

[4] Carbon equivalent emissions (CO_2e) are based on the following Global Warming Potentials (GWP) from 40 CFR Part 98, Table A-1:
Carbon Dioxide (CO_2): 1
Methane (CH_4): 25

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Haul Roads

Estimated Potential Road Fugitive Emissions

Unpaved Road Emissions

Unpaved Roads: $E\ (lb/VMT) = k(s/12)^a(W/3)^b)*[(365-p)/365]$

	PM		PM_{10}	$PM_{2.5}$	
k Factor (lb/VMT)	4.9		1.5	0.15	AP-42 Table 13.2.2-2 (Final, 11/06)
Silt content, s	4.8	%			AP-42 Table 13.2.2-1 (11/06), for Sand and Gravel Processing
Number of Rain Days, p	150				AP-42 Figure 13.2.1-2
a	0.7		0.9	0.9	AP-42 Table 13.2.2-2 (Final, 11/06)
b	0.45		0.45	0.45	AP-42 Table 13.2.2-2 (Final, 11/06)

Description	Weight of Empty Truck (tons)	Weight of Truck w/ Max Load (tons)	Mean Vehicle Weight (tons)	Length of Unpaved Road Traveled (mile)	Trips Per Year	Mileage Per Year	Control (%)	Emissions (tpy) PM	PM_{10}	$PM_{2.5}$
Liquids Hauling	20	40	30	0.31	6,005	3,753	0	8.04	2.05	0.20
Employee Vehicles	3	3	3	0.31	200	125	0	0.09	0.02	0.00
Total Potential Emissions								**8.13**	**2.07**	**0.21**

Company Name: CNX Gas Company LLC
Facility Name: PEN1 Wellpad
Project Description: G70-D Application

Gas Analysis

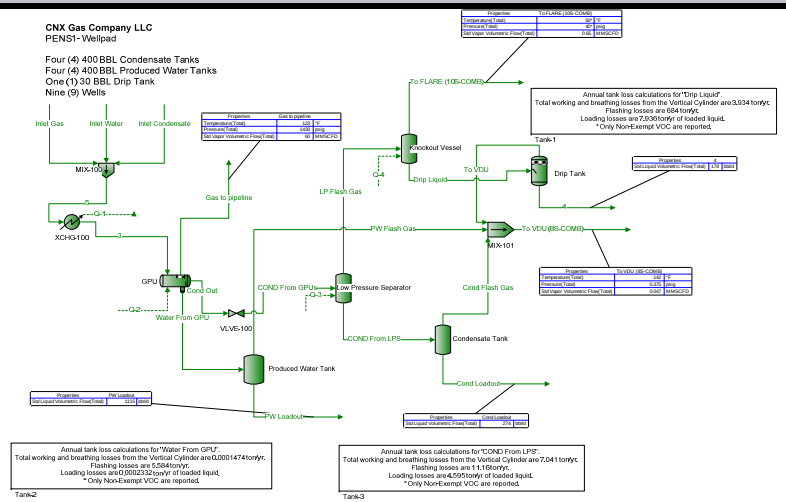
Sample Location: SHL 3-B
Sample Date: 11/13/2012
HHV (Btu/scf): 1,249

Constituent	Natural Gas Stream Speciation (Mole %)	Molecular Weight	Molar Weight	Average Weight Fraction	Natural Gas Stream Speciation (Wt. %)
Carbon Dioxide	0.122	44.01	0.05	0.00	0.261
Nitrogen	0.343	28.01	0.10	0.00	0.468
Methane	78.499	16.04	12.59	0.61	61.386
Ethane	14.428	30.07	4.34	0.21	21.152
Propane	4.265	44.10	1.88	0.09	9.169
Isobutane	0.506	58.12	0.29	0.01	1.433
n-Butane	1.017	58.12	0.59	0.03	2.883
Isopentane	0.252	72.15	0.18	0.01	0.885
n-Pentane	0.244	72.15	0.18	0.01	0.858
Cyclopentane	<0.001	70.1	0.0	0.0	0.000
Methylcyclopentane	0.009	84.2	0.0	0.0	0.037
i-hexane	0.097	86.2	0.1	0.0	0.408
neohexane	0.023	86.2	0.0	0.0	0.095
n-Hexane	0.074	86.18	0.06	0.00	0.311
Cyclohexane	0.007	84.16	0.01	0.00	0.028
Other Hexanes	<0.001	86.18	0.00	0.00	0.000
1t,2-Dimethylcyclopentane	0.001	98.19	0.00	0.00	0.004
1c,2-Dimethylcyclopentane	0.000	98.19	0.00	0.00	0.001
Methylcyclohexane	0.012	98.19	0.01	0.00	0.056
i-heptane	0.047	100.21	0.05	0.00	0.230
n-heptane	0.022	100.21	0.02	0.00	0.106
i-octane	0.022	114.23	0.03	0.00	0.123
Benzene*	0.001	78.11	0.00	0.00	0.005
Toluene*	0.003	92.14	0.00	0.00	0.013
Ethylbenzene*	<0.001	106.17	0.00	0.00	0.000
Xylenes*	0.004	106.16	0.00	0.00	0.022
ethylcyclohexane	0.001	112.22	0.00	0.00	0.003
C8 + Heavies	0.010	130.80	0.01	0.00	0.066
Totals	100.01		20.51	1.00	100

TOC (Total)	99.54	99.27
VOC (Total)	6.62	16.73
HAP (Total)	0.12	0.57

PENS1 Wellpad
Plant Schematic

Client Name:	CNX Gas Production LLC	Job:
Location:	PEN1 Wellpad	
Flowsheet:	PENS1 Wellpad	



Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	CNX Gas Production LLC	Job:	
Location:	PEN1 Wellpad		
Flowsheet:	PENS1 Wellpad		

Connections

	Cond Loadout	Gas to pipeline	Inlet Condensate	Inlet Gas	Inlet Water
From Block	Condensate Tank	GPU	--	--	--
To Block	--	--	MIX-100	MIX-100	MIX-100

Stream Composition

Mole Fraction	Cond Loadout %	Gas to pipeline %	Inlet Condensate %	Inlet Gas %	Inlet Water %
Nitrogen	9.41727E-06	0.337332	0 *	0.3429 *	0 *
Methane	0.0267356	77.0922	5.404 *	78.4994 *	0 *
Carbon Dioxide	0.000297391	0.118424	0 *	0.1218 *	0 *
Ethane	0.175138	14.2387	9.472 *	14.4282 *	0 *
Propane	0.547078	4.39881	12.27 *	4.2648 *	0 *
i-Butane	0.306794	0.564991	3.427 *	0.5059 *	0 *
n-Butane	1.18224	1.2308	10.945 *	1.0173 *	0 *
i-Pentane	1.26322	0.366299	5.484 *	0.2517 *	0 *
n-Pentane	2.07956	0.409755	7.731 *	0.2439 *	0 *
2,2-Dimethylbutane	1.78502	0.175691	6.862 *	0.0084 *	0 *
2,3-Dimethylbutane	0.148124	0.0102968	0 *	0.0127 *	0 *
2-Methylpentane	0.742173	0.0480553	0 *	0.0596 *	0 *
3-Methylpentane	0.530004	0.0297577	0 *	0.0374 *	0 *
n-Hexane	4.47052	0.206758	6.473 *	0.074 *	0 *
2,2-Dimethylpentane	0.0345862	0.00113381	0 *	0.0015 *	0 *
Methylcyclopentane	0.165868	0.00682142	0 *	0.0089 *	0 *
Benzene	0.084461	0.00330424	0.107 *	0.0012 *	0 *
Cyclohexane	0.750963	0.0234877	0.839 *	0.0068 *	0 *
2-Methylhexane	0.811277	0.0176096	0 *	0.0247 *	0 *
2,3-Dimethylpentane	0.151811	0.00326923	0 *	0.0046 *	0 *
3-Methylhexane	0.627425	0.0124033	0 *	0.0177 *	0 *
1t,2-Dimethylcyclopentane	0.029118	0.000552584	0 *	0.0008 *	0 *
1c,2-Dimethylcyclopentane	0.00897146	0.000131916	0 *	0.0002 *	0 *
n-Heptane	15.5776	0.247946	11.687 *	0.0217 *	0 *
Methylcyclohexane	0.545305	0.00764772	0 *	0.0117 *	0 *
2,5-Dimethylhexane	0.0613572	0.000698161	0 *	0.0011 *	0 *
2,4-Dimethylhexane	0.0897105	0.00101404	0 *	0.0016 *	0 *
Toluene	0.908445	0.0108293	0.489 *	0.0028 *	0 *
2-Methylheptane	0.311751	0.00256172	0 *	0.0044 *	0 *
4-Methylheptane	0.177106	0.00145804	0 *	0.0025 *	0 *
3-Methylheptane	0.189453	0.00150084	0 *	0.0026 *	0 *
n-Octane	26.4783	0.168968	10.404 *	0.0056 *	0 *
1c,2-Dimethylcyclohexane	0.182822	0.00111887	0 *	0.0021 *	0 *
Ethylcyclohexane	0.0376226	0.000286821	0 *	0.0005 *	0 *
Ethylbenzene	0.291638	0.00151554	0.103 *	0 *	0 *
m-Xylene	2.60133	0.0128602	0.798 *	0.0027 *	0 *
p-Xylene	0.145883	0.000745017	0 *	0.0015 *	0 *
n-Nonane	15.8681	0.0470769	3.951 *	0.0023 *	0 *
Decane	8.14317	0.0135236	1.535 *	0.0019 *	0 *
Undecane	12.4683	0.0107342	2.019 *	0.0005 *	0 *
Water	0.000729174	0.1729	0 *	0.0001 *	100 *

Molar Flow	Cond Loadout lbmol/h	Gas to pipeline lbmol/h	Inlet Condensate lbmol/h	Inlet Gas lbmol/h	Inlet Water lbmol/h
Nitrogen	2.323E-06	22.1281	0 *	22.2134 *	0 *
Methane	0.006595	5057.05	10.3268 *	5085.27 *	0 *
Carbon Dioxide	7.33589E-05	7.76828	0 *	7.89032 *	0 *
Ethane	0.0432022	934.022	18.1005 *	934.673 *	0 *
Propane	0.13495	288.551	23.4474 *	276.278 *	0 *
i-Butane	0.0756782	37.0619	6.54883 *	32.7727 *	0 *

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	CNX Gas Production LLC	Job:	
Location:	PEN1 Wellpad		
Flowsheet:	PENS1 Wellpad		

Molar Flow	Cond Loadout lbmol/h	Gas to pipeline lbmol/h	Inlet Condensate lbmol/h	Inlet Gas lbmol/h	Inlet Water lbmol/h
n-Butane	0.291629	80.7374	20.9154 *	65.9017 *	0 *
i-Pentane	0.311605	24.0282	10.4797 *	16.3054 *	0 *
n-Pentane	0.512974	26.8788	14.7736 *	15.8001 *	0 *
2,2-Dimethylbutane	0.440318	11.5249	13.113 *	0.54416 *	0 *
2,3-Dimethylbutane	0.0365384	0.67544	0 *	0.822718 *	0 *
2-Methylpentane	0.183075	3.1523	0 *	3.86094 *	0 *
3-Methylpentane	0.130738	1.95203	0 *	2.42281 *	0 *
n-Hexane	1.10276	13.5628	12.3696 *	4.79379 *	0 *
2,2-Dimethylpentane	0.00853153	0.0743749	0 *	0.0971714 *	0 *
Methylcyclopentane	0.0409155	0.447467	0 *	0.576551 *	0 *
Benzene	0.0208344	0.21675	0.204472 *	0.0777371 *	0 *
Cyclohexane	0.185243	1.54073	1.60329 *	0.44051 *	0 *
2-Methylhexane	0.200121	1.15514	0 *	1.60009 *	0 *
2,3-Dimethylpentane	0.0374478	0.214453	0 *	0.297992 *	0 *
3-Methylhexane	0.15477	0.813626	0 *	1.14662 *	0 *
1t,2-Dimethylcyclopentane	0.00718267	0.0362481	0 *	0.0518248 *	0 *
1c,2-Dimethylcyclopentane	0.00221303	0.00865336	0 *	0.0129562 *	0 *
n-Heptane	3.84259	16.2646	22.3333 *	1.40575 *	0 *
Methylcyclohexane	0.134513	0.50167	0 *	0.757937 *	0 *
2,5-Dimethylhexane	0.0151353	0.0457976	0 *	0.0712591 *	0 *
2,4-Dimethylhexane	0.0221293	0.0665181	0 *	0.10365 *	0 *
Toluene	0.22409	0.710375	0.934455 *	0.181387 *	0 *
2-Methylheptane	0.0769009	0.168042	0 *	0.285036 *	0 *
4-Methylheptane	0.0436875	0.0956436	0 *	0.161952 *	0 *
3-Methylheptane	0.0467332	0.0984512	0 *	0.16843 *	0 *
n-Octane	6.53151	11.0839	19.8815 *	0.362773 *	0 *
1c,2-Dimethylcyclohexane	0.0450975	0.0733951	0 *	0.13604 *	0 *
Ethylcyclohexane	0.00928053	0.0188147	0 *	0.0323905 *	0 *
Ethylbenzene	0.0719396	0.0994151	0.196828 *	0 *	0 *
m-Xylene	0.641682	0.843595	1.52494 *	0.174909 *	0 *
p-Xylene	0.0359855	0.0488711	0 *	0.0971714 *	0 *
n-Nonane	3.91425	3.08812	7.55017 *	0.148996 *	0 *
Decane	2.00871	0.88711	2.93331 *	0.123084 *	0 *
Undecane	3.07562	0.704139	3.85821 *	0.0323905 *	0 *
Water	0.000179869	11.3418	0 *	0.0064781 *	914.638 *

Mass Fraction	Cond Loadout %	Gas to pipeline %	Inlet Condensate %	Inlet Gas %	Inlet Water %
Nitrogen	2.27876E-06	0.441167	0 *	0.468483 *	0 *
Methane	0.00370484	57.738	1.1605 *	61.4183 *	0 *
Carbon Dioxide	0.000113053	0.243313	0 *	0.261429 *	0 *
Ethane	0.0454893	19.988	3.81257 *	21.1589 *	0 *
Propane	0.208379	9.05546	7.24264 *	9.1718 *	0 *
i-Butane	0.154027	1.53307	2.66633 *	1.43406 *	0 *
n-Butane	0.593549	3.33972	8.51559 *	2.88371 *	0 *
i-Pentane	0.78726	1.2338	5.29643 *	0.885672 *	0 *
n-Pentane	1.29601	1.38017	7.46658 *	0.858225 *	0 *
2,2-Dimethylbutane	1.32872	0.706827	7.91573 *	0.0353039 *	0 *
2,3-Dimethylbutane	0.11026	0.0414251	0 *	0.0533762 *	0 *
2-Methylpentane	0.552455	0.193332	0 *	0.25049 *	0 *
3-Methylpentane	0.394521	0.119719	0 *	0.157187 *	0 *
n-Hexane	3.32774	0.831812	7.46699 *	0.311011 *	0 *
2,2-Dimethylpentane	0.0299356	0.00530391	0 *	0.0073304 *	0 *
Methylcyclopentane	0.12058	0.0268014	0 *	0.0365303 *	0 *
Benzene	0.0569878	0.0120495	0.111881 *	0.0045715 *	0 *
Cyclohexane	0.545921	0.0922834	0.945196 *	0.0279108 *	0 *
2-Methylhexane	0.702189	0.0823767	0 *	0.120707 *	0 *
2,3-Dimethylpentane	0.131397	0.0152933	0 *	0.0224799 *	0 *
3-Methylhexane	0.543058	0.0580222	0 *	0.0864988 *	0 *

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	CNX Gas Production LLC	Job:	
Location:	PEN1 Wellpad		
Flowsheet:	PENS1 Wellpad		

Mass Fraction	Cond Loadout %	Gas to pipeline %	Inlet Condensate %	Inlet Gas %	Inlet Water %
1t,2-Dimethylcyclopentane	0.0246956	0.00253296	0 *	0.0038309 *	0 *
1c,2-Dimethylcyclopentane	0.00760889	0.000604683	0 *	0.000957724 *	0 *
n-Heptane	13.4829	1.15988	15.676 *	0.106047 *	0 *
Methylcyclohexane	0.462485	0.035056	0 *	0.0560269 *	0 *
2,5-Dimethylhexane	0.0605409	0.00372315	0 *	0.00612813 *	0 *
2,4-Dimethylhexane	0.0885169	0.00540764	0 *	0.00891364 *	0 *
Toluene	0.723016	0.0465824	0.603124 *	0.0125823 *	0 *
2-Methylheptane	0.307603	0.0136611	0 *	0.0245125 *	0 *
4-Methylheptane	0.174749	0.00777542	0 *	0.0139276 *	0 *
3-Methylheptane	0.186932	0.00800367	0 *	0.0144847 *	0 *
n-Octane	26.126	0.901071	15.9086 *	0.0311977 *	0 *
1c,2-Dimethylcyclohexane	0.177206	0.00586141	0 *	0.0114927 *	0 *
Ethylcyclohexane	0.0364669	0.00150256	0 *	0.00273635 *	0 *
Ethylbenzene	0.267445	0.00751151	0.146378 *	0 *	0 *
m-Xylene	2.38553	0.0637395	1.13407 *	0.01398 *	0 *
p-Xylene	0.133781	0.00369256	0 *	0.00776664 *	0 *
n-Nonane	17.5796	0.281879	6.78326 *	0.0143868 *	0 *
Decane	10.0081	0.0898297	2.92358 *	0.0131845 *	0 *
Undecane	16.8345	0.078331	4.2245 *	0.00381165 *	0 *
Water	0.00011347	0.145417	0 *	8.78621E-05 *	100 *

Mass Flow	Cond Loadout lb/h	Gas to pipeline lb/h	Inlet Condensate lb/h	Inlet Gas lb/h	Inlet Water lb/h
Nitrogen	6.50751E-05	619.883	0 *	622.273 *	0 *
Methane	0.1058	81127.5	165.667 *	81580.2 *	0 *
Carbon Dioxide	0.00322849	341.878	0 *	347.249 *	0 *
Ethane	1.29905	28085.1	544.266 *	28104.7 *	0 *
Propane	5.95071	12723.8	1033.93 *	12182.6 *	0 *
i-Butane	4.39858	2154.12	380.633 *	1904.82 *	0 *
n-Butane	16.9501	4692.64	1215.65 *	3830.35 *	0 *
i-Pentane	22.4819	1733.61	756.095 *	1176.41 *	0 *
n-Pentane	37.0104	1939.28	1065.89 *	1139.96 *	0 *
2,2-Dimethylbutane	37.9445	993.161	1130.01 *	46.8932 *	0 *
2,3-Dimethylbutane	3.14871	58.2063	0 *	70.898 *	0 *
2-Methylpentane	15.7766	271.651	0 *	332.718 *	0 *
3-Methylpentane	11.2664	168.217	0 *	208.786 *	0 *
n-Hexane	95.031	1168.78	1065.95 *	413.107 *	0 *
2,2-Dimethylpentane	0.854876	7.45251	0 *	9.73677 *	0 *
Methylcyclopentane	3.44343	37.6586	0 *	48.5222 *	0 *
Benzene	1.62741	16.9307	15.9717 *	6.07219 *	0 *
Cyclohexane	15.59	129.667	134.932 *	37.0731 *	0 *
2-Methylhexane	20.0525	115.747	0 *	160.332 *	0 *
2,3-Dimethylpentane	3.75234	21.4886	0 *	29.8594 *	0 *
3-Methylhexane	15.5082	81.5269	0 *	114.894 *	0 *
1t,2-Dimethylcyclopentane	0.705238	3.55906	0 *	5.08847 *	0 *
1c,2-Dimethylcyclopentane	0.217289	0.849639	0 *	1.27212 *	0 *
n-Heptane	385.035	1629.74	2237.84 *	140.859 *	0 *
Methylcyclohexane	13.2073	49.257	0 *	74.4189 *	0 *
2,5-Dimethylhexane	1.72888	5.23139	0 *	8.13982 *	0 *
2,4-Dimethylhexane	2.5278	7.59826	0 *	11.8397 *	0 *
Toluene	20.6473	65.4528	86.0992 *	16.7127 *	0 *
2-Methylheptane	8.78428	19.1952	0 *	32.5593 *	0 *
4-Methylheptane	4.99035	10.9252	0 *	18.4996 *	0 *
3-Methylheptane	5.33827	11.2459	0 *	19.2396 *	0 *
n-Octane	746.085	1266.09	2271.04 *	41.4391 *	0 *
1c,2-Dimethylcyclohexane	5.06051	8.23585	0 *	15.2654 *	0 *
Ethylcyclohexane	1.04139	2.11125	0 *	3.63462 *	0 *
Ethylbenzene	7.63747	10.5544	20.8962 *	0 *	0 *
m-Xylene	68.1242	89.5603	161.895 *	18.5692 *	0 *

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	CNX Gas Production LLC	Job:	
Location:	PEN1 Wellpad		
Flowsheet:	PENS1 Wellpad		

Mass Flow	Cond Loadout lb/h	Gas to pipeline lb/h	Inlet Condensate lb/h	Inlet Gas lb/h	Inlet Water lb/h
p-Xylene	3.8204	5.1884	0 *	10.3162 *	0 *
n-Nonane	502.023	396.067	968.348 *	19.1095 *	0 *
Decane	285.803	126.219	417.356 *	17.5126 *	0 *
Undecane	480.745	110.063	603.07 *	5.0629 *	0 *
Water	0.00324038	204.326	0 *	0.116705 *	16477.5 *

Stream Properties

Property	Units	Cond Loadout	Gas to pipeline	Inlet Condensate	Inlet Gas	Inlet Water
Temperature	°F	185.811	122.907	55 *	55 *	55 *
Pressure	psia	15.0709	1444.7	1454.7 *	1454.7 *	1454.7 *
Mole Fraction Vapor	%	0	100	0	100	0
Mole Fraction Light Liquid	%	100	0	100	0	100
Mole Fraction Heavy Liquid	%	0	0	0	0	0
Molecular Weight	lb/lbmol	115.769	21.42	74.7038	20.504	18.0153
Mass Density	lb/ft^3	41.0126	6.42356	41.1797	8.27582	62.485
Molar Flow	lbmol/h	24.6674	6559.74	191.095	6478.1	914.638
Mass Flow	lb/h	2855.72	140510	14275.5	132827	16477.5
Vapor Volumetric Flow	ft^3/h	69.6303	21874.1	346.664	16050	263.703
Liquid Volumetric Flow	gpm	8.68118	2727.16	43.2205	2001.04	32.8772
Std Vapor Volumetric Flow	MMSCFD	0.224662	59.7436	1.74042	59 *	8.33018
Std Liquid Volumetric Flow	sgpm	7.99167	806.699	45.566 *	784.846	32.9397 *
Compressibility		0.0061414	0.770556	0.477792	0.652542	0.0759356
Specific Gravity		0.65758	0.739576	0.66026	0.707949	1.00186
Net Ideal Gas Heating Value	Btu/ft^3	5852.41	1169.43	3823.89	1125.53	0
Net Liquid Heating Value	Btu/lb	19020.2	20651.6	19268.5	20771.7	-1059.76
API Gravity		65.7014		83.6667		9.82512

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	CNX Gas Production LLC	Job:	
Location:	PEN1 Wellpad		
Flowsheet:	PENS1 Wellpad		

Connections

	PW Loadout	To FLARE (10S-COMB)	To VDU	To VDU (8S-COMB)	4
From Block	Produced Water Tank	Knockout Vessel	Drip Tank	MIX-101	Drip Tank
To Block	--	--	MIX-101	--	--

Stream Composition

Mole Fraction	PW Loadout %	To FLARE (10S-COMB) %	To VDU %	To VDU (8S-COMB) %	4 %
Nitrogen	2.03776E-06	0.115314	0.00883942	0.06434	1.42275E-05
Methane	0.00140738	52.1845	13.8659	27.3715	0.0870138
Carbon Dioxide	0.000388495	0.137752	0.093829	0.390694	0.00186305
Ethane	0.000233883	24.6291	31.1355	17.2588	1.51995
Propane	2.3157E-05	12.8351	28.6362	14.9487	5.66019
i-Butane	6.22399E-07	1.99245	5.20128	3.2194	2.97552
n-Butane	3.69428E-06	4.48516	11.9908	8.44764	10.7047
i-Pentane	2.47531E-07	1.12123	3.00925	3.3499	7.29887
n-Pentane	9.71939E-08	1.16544	3.09235	4.21755	10.5665
2,2-Dimethylbutane	1.38521E-08	0.399729	1.04999	2.17268	6.41017
2,3-Dimethylbutane	3.72072E-09	0.0199565	0.0517477	0.139721	0.442025
2-Methylpentane	1.09529E-08	0.0879048	0.226939	0.65905	2.12282
3-Methylpentane	3.38975E-08	0.0516143	0.132994	0.425766	1.39212
n-Hexane	1.26788E-08	0.294591	0.741923	3.06568	10.5393
2,2-Dimethylpentane	7.79918E-11	0.00122727	0.0030527	0.0174537	0.0618037
Methylcyclopentane	2.01227E-08	0.010948	0.0280469	0.110015	0.369617
Benzene	2.62295E-05	0.00539372	0.0136415	0.0600433	0.185311
Cyclohexane	2.68161E-07	0.0305723	0.0766864	0.39332	1.36448
2-Methylhexane	5.50477E-10	0.0133213	0.032248	0.295448	1.089
2,3-Dimethylpentane	3.46141E-10	0.00257862	0.00626297	0.0557797	0.204727
3-Methylhexane	4.70051E-10	0.00865991	0.0207719	0.214355	0.796595
1t,2-Dimethylcyclopentane	9.25374E-09	0.000432079	0.00104996	0.0101966	0.037406
1c,2-Dimethylcyclopentane	1.53241E-09	8.21439E-05	0.000197345	0.00252713	0.00940513
n-Heptane	3.93771E-09	0.133378	0.313918	4.3372	16.3921
Methylcyclohexane	1.22367E-08	0.00450768	0.0107284	0.146661	0.549079
2,5-Dimethylhexane	2.40019E-13	0.000245704	0.000564272	0.0122367	0.0471007
2,4-Dimethylhexane	1.82536E-12	0.000372447	0.000862262	0.0178333	0.0683601
Toluene	3.89665E-05	0.00646061	0.0153344	0.22658	0.815051
2-Methylheptane	2.03367E-11	0.000635548	0.00143392	0.0472025	0.184074
4-Methylheptane	6.51324E-12	0.000349921	0.000783457	0.0265816	0.103902
3-Methylheptane	7.82557E-12	0.000346721	0.000776696	0.0273161	0.106816
n-Octane	4.70835E-10	0.0284321	0.0625621	3.06808	12.1234
1c,2-Dimethylcyclohexane	2.47091E-11	0.000206599	0.00046691	0.0207067	0.0808025
Ethylcyclohexane	7.20079E-10	7.46826E-05	0.000174785	0.00513265	0.0196776
Ethylbenzene	2.19875E-06	0.00028016	0.000624057	0.0304153	0.11718
m-Xylene	1.18251E-05	0.00218993	0.00487635	0.254959	0.988262
p-Xylene	7.53681E-07	0.000132956	0.00029759	0.014672	0.0566802
n-Nonane	2.71403E-11	0.00209438	0.00432779	0.792086	3.23777
Decane	5.55499E-13	0.000152142	0.000293901	0.176717	0.748784
Undecane	1.34904E-13	2.96783E-05	5.31211E-05	0.118011	0.518161
Water	99.9979	0.227038	0.162424	3.78709	0.00345278

Molar Flow	PW Loadout lbmol/h	To FLARE (10S-COMB) lbmol/h	To VDU lbmol/h	To VDU (8S-COMB) lbmol/h	4 lbmol/h
Nitrogen	1.84002E-05	0.0819753	0.000146025	0.00331914	2.87577E-06
Methane	0.0127081	37.0973	0.229061	1.41203	0.0175878
Carbon Dioxide	0.00350797	0.0979264	0.00155004	0.020155	0.000376572
Ethane	0.00211188	17.5085	0.514352	0.89034	0.307224
Propane	0.0002091	9.12429	0.473065	0.771167	1.14408
i-Butane	5.62004E-06	1.4164	0.085924	0.166081	0.601432

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	CNX Gas Production LLC	Job:
Location:	PEN1 Wellpad	
Flowsheet:	PENS1 Wellpad	

Molar Flow	PW Loadout lbmol/h	To FLARE (10S-COMB) lbmol/h	To VDU lbmol/h	To VDU (8S-COMB) lbmol/h	4 lbmol/h
n-Butane	3.33581E-05	3.18844	0.198085	0.435794	2.16371
i-Pentane	2.23512E-06	0.797068	0.0497121	0.172813	1.4753
n-Pentane	8.77627E-07	0.828493	0.051085	0.217573	2.13576
2,2-Dimethylbutane	1.25079E-07	0.284162	0.0173456	0.112083	1.29567
2,3-Dimethylbutane	3.35968E-08	0.0141868	0.000854861	0.00720788	0.0893451
2-Methylpentane	9.8901E-08	0.0624904	0.00374899	0.0339988	0.429078
3-Methylpentane	3.06082E-07	0.036692	0.00219704	0.0219643	0.281386
n-Hexane	1.14485E-07	0.209421	0.0122564	0.158151	2.13028
2,2-Dimethylpentane	7.04239E-10	0.000872447	5.043E-05	0.000900393	0.0124922
Methylcyclopentane	1.81701E-07	0.00778277	0.000463329	0.0056754	0.0747095
Benzene	0.000236844	0.00383433	0.000225355	0.00309749	0.0374563
Cyclohexane	2.4214E-06	0.0217335	0.00126684	0.0202904	0.275798
2-Methylhexane	4.97061E-09	0.00946992	0.00053273	0.0152415	0.220116
2,3-Dimethylpentane	3.12553E-09	0.00183311	0.000103463	0.00287754	0.0413809
3-Methylhexane	4.24439E-09	0.00615621	0.000343147	0.011058	0.161013
1t,2-Dimethylcyclopentane	8.35581E-08	0.000307159	1.73451E-05	0.000526018	0.00756076
1c,2-Dimethylcyclopentane	1.38371E-08	5.8395E-05	3.26009E-06	0.000130369	0.00190103
n-Heptane	3.55561E-08	0.0948167	0.00518586	0.223745	3.31329
Methylcyclohexane	1.10493E-07	0.00320445	0.000177231	0.00756586	0.110984
2,5-Dimethylhexane	2.16729E-12	0.000174667	9.32166E-06	0.000631262	0.00952031
2,4-Dimethylhexane	1.64823E-11	0.000264768	1.42444E-05	0.000919975	0.0138174
Toluene	0.000351853	0.00459276	0.000253322	0.0116887	0.164744
2-Methylheptane	1.83633E-10	0.000451802	2.3688E-05	0.00243506	0.0372062
4-Methylheptane	5.88122E-11	0.000248754	1.29425E-05	0.00137128	0.0210013
3-Methylheptane	7.06621E-11	0.00024648	1.28308E-05	0.00140917	0.0215904
n-Octane	4.25147E-09	0.020212	0.00103351	0.158275	2.45045
1c,2-Dimethylcyclohexane	2.23115E-10	0.000146868	7.71325E-06	0.00106821	0.0163324
Ethylcyclohexane	6.50206E-09	5.30908E-05	2.88742E-06	0.000264781	0.00397737
Ethylbenzene	1.98539E-05	0.000199162	1.03093E-05	0.00156905	0.0236852
m-Xylene	0.000106776	0.00155679	8.05562E-05	0.0131527	0.199754
p-Xylene	6.80547E-06	9.45165E-05	4.91613E-06	0.000756895	0.0114566
n-Nonane	2.45067E-10	0.00148887	7.14941E-05	0.0408618	0.654441
Decane	5.01596E-12	0.000108155	4.85519E-06	0.00911638	0.151349
Undecane	1.21813E-12	2.10979E-05	8.77549E-07	0.00608791	0.104734
Water	902.946	0.161399	0.0026832	0.195367	0.0006979

Mass Fraction	PW Loadout %	To FLARE (10S-COMB) %	To VDU %	To VDU (8S-COMB) %	4 %
Nitrogen	3.16864E-06	0.115486	0.00601439	0.0391187	4.68054E-06
Methane	0.00125325	29.9291	5.40281	9.53032	0.016393
Carbon Dioxide	0.000949045	0.216734	0.100296	0.373183	0.000962878
Ethane	0.000390367	26.4758	22.7393	11.2634	0.536724
Propane	5.66804E-05	20.2337	30.67	14.3066	2.93107
i-Butane	2.00801E-06	4.14009	7.34267	4.06121	2.03098
n-Butane	1.19186E-05	9.31969	16.9274	10.6565	7.30664
i-Pentane	9.91321E-07	2.89205	5.27337	5.24564	6.18422
n-Pentane	3.89245E-07	3.00606	5.41901	6.6043	8.9528
2,2-Dimethylbutane	6.62601E-08	1.23149	2.19771	4.06365	6.48714
2,3-Dimethylbutane	1.77978E-08	0.0614819	0.108312	0.261327	0.447332
2-Methylpentane	5.23923E-08	0.270817	0.475001	1.23265	2.14831
3-Methylpentane	1.62146E-07	0.159014	0.278367	0.796329	1.40884
n-Hexane	6.06479E-08	0.907578	1.5529	5.73387	10.6658
2,2-Dimethylpentane	4.33791E-10	0.00439639	0.00742955	0.0379578	0.0727262
Methylcyclopentane	9.40034E-08	0.0329396	0.0573311	0.200952	0.365305
Benzene	0.000113727	0.0150621	0.0258811	0.101793	0.169988
Cyclohexane	1.25272E-06	0.0919841	0.156755	0.718434	1.34856
2-Methylhexane	3.06175E-09	0.0477203	0.0784839	0.642533	1.28146
2,3-Dimethylpentane	1.92524E-09	0.00923729	0.0152426	0.121308	0.240909
3-Methylhexane	2.61442E-09	0.031022	0.0505537	0.466173	0.937376

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	CNX Gas Production LLC	Job:	
Location:	PEN1 Wellpad		
Flowsheet:	PENS1 Wellpad		

Mass Fraction	PW Loadout %	To FLARE (10S-COMB) %	To VDU %	To VDU (8S-COMB) %	4 %
1t,2-Dimethylcyclopentane	5.04339E-08	0.00151668	0.00250394	0.0217292	0.0431312
1c,2-Dimethylcyclopentane	8.3518E-09	0.000288341	0.000470627	0.00538537	0.0108446
n-Heptane	2.19015E-08	0.477795	0.764001	9.43242	19.2891
Methylcyclohexane	6.66914E-08	0.0158228	0.025585	0.312537	0.633118
2,5-Dimethylhexane	1.52186E-12	0.00100338	0.00156554	0.0303373	0.0631833
2,4-Dimethylhexane	1.15738E-11	0.00152097	0.0023923	0.0442123	0.0917018
Toluene	0.000199291	0.0212812	0.0343171	0.453107	0.881914
2-Methylheptane	1.28946E-10	0.0025954	0.00397832	0.117025	0.246926
4-Methylheptane	4.12978E-11	0.00142898	0.00217366	0.0659013	0.139379
3-Methylheptane	4.96187E-11	0.00141591	0.0021549	0.0677221	0.143289
n-Octane	2.98537E-09	0.116109	0.173575	7.6064	16.2629
1c,2-Dimethylcyclohexane	1.53905E-10	0.000828801	0.00127255	0.0504303	0.10648
Ethylcyclohexane	4.48515E-09	0.0002996	0.000476374	0.0125003	0.0259307
Ethylbenzene	1.29572E-05	0.00106333	0.00160919	0.0700829	0.146095
m-Xylene	6.96852E-05	0.00831177	0.0125741	0.587476	1.23212
p-Xylene	4.44144E-06	0.000504626	0.000767365	0.0338072	0.0706665
n-Nonane	1.93217E-10	0.00960311	0.0134816	2.20488	4.87665
Decane	4.38719E-12	0.000773888	0.00101567	0.545713	1.25114
Undecane	1.17047E-12	0.000165845	0.000201674	0.400353	0.951145
Water	99.9969	0.146225	0.0710709	1.48076	0.000730484

Mass Flow	PW Loadout lb/h	To FLARE (10S-COMB) lb/h	To VDU lb/h	To VDU (8S-COMB) lb/h	4 lb/h
Nitrogen	0.000515453	2.29641	0.00409067	0.0929805	8.056E-05
Methane	0.20387	595.132	3.6747	22.6524	0.282152
Carbon Dioxide	0.154384	4.30969	0.0682163	0.88701	0.0165728
Ethane	0.0635022	526.464	15.4661	26.7717	9.23792
Propane	0.00922039	402.341	20.8601	34.0051	50.4487
i-Butane	0.000326649	82.3245	4.99409	9.653	34.9565
n-Butane	0.00193884	185.319	11.5131	25.3293	125.76
i-Pentane	0.000161261	57.5075	3.58667	12.4682	106.441
n-Pentane	6.33197E-05	59.7747	3.68572	15.6976	154.093
2,2-Dimethylbutane	1.07787E-05	24.4878	1.49476	9.65881	111.655
2,3-Dimethylbutane	2.89522E-06	1.22255	0.073668	0.621142	7.69935
2-Methylpentane	8.52283E-06	5.38513	0.323071	2.92986	36.976
3-Methylpentane	2.63768E-05	3.16194	0.18933	1.89278	24.2485
n-Hexane	9.86578E-06	18.0469	1.0562	13.6287	183.577
2,2-Dimethylpentane	7.05661E-08	0.0874209	0.00505319	0.0902211	1.25174
Methylcyclopentane	1.52918E-05	0.654994	0.0389936	0.477639	6.28751
Benzene	0.0185003	0.299506	0.0176029	0.24195	2.92578
Cyclohexane	0.000203784	1.82908	0.106617	1.70763	23.211
2-Methylhexane	4.98065E-07	0.948904	0.0533806	1.52722	22.056
2,3-Dimethylpentane	3.13185E-07	0.183681	0.0103672	0.288335	4.14644
3-Methylhexane	4.25296E-07	0.616864	0.034384	1.10804	16.1338
1t,2-Dimethylcyclopentane	8.20424E-06	0.0301587	0.00170305	0.0516476	0.742361
1c,2-Dimethylcyclopentane	1.35861E-06	0.00573357	0.000320096	0.0128004	0.186655
n-Heptane	3.56279E-06	9.50082	0.519633	22.4197	331.998
Methylcyclohexane	1.08489E-05	0.314633	0.0174016	0.742862	10.897
2,5-Dimethylhexane	2.47566E-10	0.019952	0.0010648	0.0721081	1.08749
2,4-Dimethylhexane	1.88275E-09	0.030244	0.00162712	0.105087	1.57834
Toluene	0.0324192	0.42317	0.0233407	1.07698	15.1792
2-Methylheptane	2.09761E-08	0.0516087	0.00270584	0.278153	4.25001
4-Methylheptane	6.71804E-09	0.0284148	0.00147841	0.156639	2.39895
3-Methylheptane	8.07163E-09	0.028155	0.00146565	0.160967	2.46624
n-Octane	4.85639E-07	2.30879	0.118057	18.0795	279.912
1c,2-Dimethylcyclohexane	2.50363E-08	0.0164805	0.000865524	0.119867	1.8327
Ethylcyclohexane	7.29613E-07	0.00595746	0.000324005	0.0297118	0.446311
Ethylbenzene	0.00210779	0.021144	0.00109449	0.166579	2.51454
m-Xylene	0.0113359	0.165277	0.00855225	1.39636	21.2069

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	CNX Gas Production LLC	Job:
Location:	PEN1 Wellpad	
Flowsheet:	PENS1 Wellpad	

Mass Flow	PW Loadout lb/h	To FLARE (10S-COMB) lb/h	To VDU lb/h	To VDU (8S-COMB) lb/h	4 lb/h
p-Xylene	0.000722503	0.0100343	0.000521921	0.0803557	1.21629
n-Nonane	3.14311E-08	0.190955	0.00916948	5.24074	83.9354
Decane	7.13679E-10	0.0153885	0.000690805	1.29709	21.5342
Undecane	1.90404E-10	0.00329778	0.000137168	0.951591	16.3708
Water	16266.8	2.90764	0.0483387	3.51959	0.0125729

Stream Properties

Property	Units	PW Loadout	To FLARE (10S-COMB)	To VDU	To VDU (8S-COMB)	4
Temperature	°F	126.442	50 *	38.0153	141.755	38.0153
Pressure	psia	15.0709	54.6959 *	15.0709 *	15.0709	15.0709
Mole Fraction Vapor	%	0	100	100	99.5652	0
Mole Fraction Light Liquid	%	100	0	0	0.434773	100
Mole Fraction Heavy Liquid	%	0	0	0	0	0
Molecular Weight	lb/lbmol	18.0154	27.9717	41.1717	46.0747	85.1529
Mass Density	lb/ft^3	61.5743	0.288127	0.118319	0.109435	42.4285
Molar Flow	lbmol/h	902.965	71.0887	1.65198	5.15876	20.2127
Mass Flow	lb/h	16267.3	1988.47	68.0147	237.688	1721.17
Vapor Volumetric Flow	ft^3/h	264.19	6901.36	574.842	2171.95	40.5663
Liquid Volumetric Flow	gpm	32.938	860.43	71.6686	270.789	5.05762
Std Vapor Volumetric Flow	MMSCFD	8.22386	0.647448	0.0150456	0.046984	0.184089
Std Liquid Volumetric Flow	sgpm	32.5208	10.0378	0.28631	0.904812	5.1979
Compressibility		0.000701038	0.970817	0.981898	0.983107	0.00566323
Specific Gravity		0.987258	0.965787	1.42155		0.680282
Net Ideal Gas Heating Value	Btu/ft^3	0.0206208	1500.07	2162.74	2356.41	4337.79
Net Liquid Heating Value	Btu/lb	-1059.29	20240.5	19784.5	19248.1	19164.6
API Gravity		10.0014				80.0352

Remarks

Environments Report

Client Name:	CNX Gas Production LLC	Job:	
Location:	PEN1 Wellpad		

Project-Wide Constants

Atmospheric Pressure	14.6959 psia	Ideal Gas Reference Pressure	14.6959 psia
Ideal Gas Reference Temperature	60 °F	Ideal Gas Reference Volume	379.484 ft^3/lbmol
Liquid Reference Temperature	60 °F		

Environment [Environment1]

Environment Settings

Number of Poynting Intervals	0	Phase Tolerance	1 %
Gibbs Excess Model Evaluation Temperature	77 °F	Emulsion Enabled	False
Freeze Out Temperature Threshold Difference	10 °F		

Components

Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
Nitrogen	False	False	1t,2-Dimethylcyclopentane	False	False
Methane	False	False	1c,2-Dimethylcyclopentane	False	False
Carbon Dioxide	False	False	n-Heptane	False	False
Ethane	False	False	Methylcyclohexane	False	False
Propane	False	False	2,5-Dimethylhexane	False	False
i-Butane	False	False	2,4-Dimethylhexane	False	False
n-Butane	False	False	Toluene	False	False
i-Pentane	False	False	2-Methylheptane	False	False
n-Pentane	False	False	4-Methylheptane	False	False
2,2-Dimethylbutane	False	False	3-Methylheptane	False	False
2,3-Dimethylbutane	False	False	n-Octane	False	False
2-Methylpentane	False	False	1c,2-Dimethylcyclohexane	False	False
3-Methylpentane	False	False	Ethylcyclohexane	False	False
n-Hexane	False	False	Ethylbenzene	False	False
2,2-Dimethylpentane	False	False	m-Xylene	False	False
Methylcyclopentane	False	False	p-Xylene	False	False
Benzene	False	False	n-Nonane	False	False
Cyclohexane	False	False	Decane	False	False
2-Methylhexane	False	False	Undecane	False	False
2,3-Dimethylpentane	False	False	Water	False	True
3-Methylhexane	False	False			

Physical Property Method Sets

Liquid Molar Volume	COSTALD	Overall Package	Peng-Robinson
Stability Calculation	Peng-Robinson	Vapor Package	Peng-Robinson
Light Liquid Package	Peng-Robinson	Heavy Liquid Package	Peng-Robinson

Remarks

Calculator Report

Client Name:	CNX Gas Production LLC	Job:
Location:	PEN1 Wellpad	

Simple Solver 1

Source Code

Residual Error (for CV1) = 1-PW/1115

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!PENS1 Wellpad!PStreams!Inlet Water!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	1129.36
Unit	

Measured Variable [PW]

Source Moniker	ProMax:ProMax!Project!Flowsheets!PENS1 Wellpad!PStreams!PW Loadout!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	1115
Unit	

Solver Properties

Status: Solved

Error	2.33731E-10		Iterations	3
Calculated Value	32.9397	sgpm	Max Iterations	20
Lower Bound		sgpm	Weighting	1
Upper Bound		sgpm	Priority	0
Step Size		sgpm	Solver Active	Active
Is Minimizer	False		Group	
Algorithm	Default		Skip Dependency Check	False

Remarks

Simple Solver 2

Source Code

Residual Error (for CV2) = 1-Condout/274

Calculated Variable [CV2]

Source Moniker	ProMax:ProMax!Project!Flowsheets!PENS1 Wellpad!PStreams!Inlet Condensate!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	1562.26
Unit	

Measured Variable [Condout]

Source Moniker	ProMax:ProMax!Project!Flowsheets!PENS1 Wellpad!PStreams!Cond Loadout!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	274
Unit	

Solver Properties

Status: Solved

Error	4.37458E-08		Iterations	3
Calculated Value	45.566	sgpm	Max Iterations	20
Lower Bound		sgpm	Weighting	1
Upper Bound		sgpm	Priority	0
Step Size		sgpm	Solver Active	Active
Is Minimizer	False		Group	
Algorithm	Default		Skip Dependency Check	False

Remarks

Calculator Report

Client Name:	CNX Gas Production LLC	Job:
Location:	PEN1 Wellpad	

Simple Specifier 1

Source Code

CV1 = Pin

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!PENS1 Wellpad!PStreams!Inlet Gas!Phases!Total!Properties!Pressure
Value	1440
Unit	

Measured Variable [Pin]

Source Moniker	ProMax:ProMax!Project!User Value Sets!Station Input!Inlet Pressure!Properties!Parameter
Value	1440
Unit	

Remarks

Simple Specifier 2

Source Code

CV1 = Tin

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!PENS1 Wellpad!PStreams!Inlet Gas!Phases!Total!Properties!Temperature
Value	55
Unit	

Measured Variable [Tin]

Source Moniker	ProMax:ProMax!Project!User Value Sets!Station Input!Inlet Temp!Properties!Parameter
Value	55
Unit	

Remarks

Simple Specifier 3

Source Code

CV1 = Pin

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!PENS1 Wellpad!PStreams!Inlet Water!Phases!Total!Properties!Pressure
Value	1440
Unit	

Measured Variable [Pin]

Source Moniker	ProMax:ProMax!Project!User Value Sets!Station Input!Inlet Pressure!Properties!Parameter
Value	1440
Unit	

Remarks

Calculator Report

Client Name:	CNX Gas Production LLC	Job:
Location:	PEN1 Wellpad	

Simple Specifier 4

Source Code

CV1 = Tin

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!PENS1 Wellpad!PStreams!Inlet Water!Phases!Total!Properties!Temperature
Value	55
Unit	

Measured Variable [Tin]

Source Moniker	ProMax:ProMax!Project!User Value Sets!Station Input!Inlet Temp!Properties!Parameter
Value	55
Unit	

Remarks

Simple Specifier 5

Source Code

CV1 = Pin

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!PENS1 Wellpad!PStreams!Inlet Condensate!Phases!Total!Properties!Pressure
Value	1440
Unit	

Measured Variable [Pin]

Source Moniker	ProMax:ProMax!Project!User Value Sets!Station Input!Inlet Pressure!Properties!Parameter
Value	1440
Unit	

Remarks

Simple Specifier 6

Source Code

CV1 = Tin

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!PENS1 Wellpad!PStreams!Inlet Condensate!Phases!Total!Properties!Temperature
Value	55
Unit	

Measured Variable [Tin]

Source Moniker	ProMax:ProMax!Project!User Value Sets!Station Input!Inlet Temp!Properties!Parameter
Value	55
Unit	

Remarks

Calculator Report

Client Name:	CNX Gas Production LLC	Job:
Location:	PEN1 Wellpad	

Specifier for Inlet Pressure

Source Code

CV1 = 1440

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!User Value Sets!Station Input!Inlet Pressure!Properties!Parameter
Value	1440
Unit	

Remarks

Specifier for Inlet Temp

Source Code

CV1 = 55

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!User Value Sets!Station Input!Inlet Temp!Properties!Parameter
Value	55
Unit	

Remarks

HOUSTON LABORATORIES
8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

CERTIFICATE OF ANALYSIS

Number : 2012120659-001A

JW Measurement
Deborah Murphy
669 Aero Dr.

Shreveport, LA 71107

Field:	Marshall , WV	**Report Date:**	12/31/12
Station Name:	Majorsville A	**Sample Of:**	Spot / Liquid
Station No.:		**Sample Date:**	12/13/2012
Sample Point:		**Sample Conditions:**	205 psig @ 55 °F
Cylinder # :	13873	**PO / Ref. No.:**	

Comments: Sample pressured up to 600 psig for analysis.

ANALYTICAL DATA

Components	Mol %	Wt%	LV%	Method	Lab Tech.	Date Analyzed
				GPA-2186	JL	12/31/12
Nitrogen	NIL	NIL	NIL	(MC10)		
Carbon Dioxide	NIL	NIL	NIL			
Methane	5.404	1.173	2.469			
Ethane	9.472	3.853	6.826			
Propane	12.270	7.320	9.110			
Iso Butane	3.427	2.695	3.022			
n-Butane	10.945	8.605	9.297			
iso Pentane	5.484	5.353	5.405			
n-Pentane	7.731	7.546	7.552			
Hexanes Plus	45.267	63.455	56.319			
	100.000	100.000	100.000			

	Total	Hexanes Plus
Molecular Weight	73.923	103.627
BTU / Lb.	20903	20573
BTU / Gal.	110004	121980
Cu. Ft. / Gal. At 14.73 Psia, 60°F	26.953	21.713
Lbs. / Gal. (Absolute Density)	5.2624	5.9293
Lbs. / Gal. (Weight In Air)	5.2566	5.9227
Specific Gravity at 60°F (Water = 1)	0.6312	0.7112
API Gravity at 60°F	92.676	67.464

Chris Staley

Hydrocarbon Laboratory Manager

HOUSTON LABORATORIES
8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

CERTIFICATE OF ANALYSIS

Number : 2012120659-001A

JW Measurement
Deborah Murphy
669 Aero Dr.

Shreveport, LA 71107

Field:	Marshall , WV	**Report Date:**	12/31/12
Station Name:	Majorsville A	**Sample Of:**	Spot / Liquid
Station No.:		**Sample Date:**	12/13/2012
Sample Point:		**Sample Conditions:**	205 psig @ 55 °F
Cylinder # :	13873	**PO / Ref. No.:**	

Comments:

ANALYTICAL DATA

Components	Mol %	Wt%	LV%	Method	Lab Tech.	Date Analyzed
				GPA-2186	JL	12/31/12
Nitrogen	NIL	NIL	NIL	(MC10)		
Carbon Dioxide	NIL	NIL	NIL			
Methane	5.404	1.173	2.469			
Ethane	9.472	3.853	6.826			
Propane	12.270	7.320	9.110			
iso Butane	3.427	2.695	3.022			
n-Butane	10.945	8.605	9.297			
iso Pentane	5.484	5.353	5.405			
n-Pentane	7.731	7.546	7.552			
Hexanes	13.335	15.583	14.784			
Heptanes Plus	31.932	47.872	41.535			
	100.000	100.000	100.000			

	Total	Heptanes Plus
Molecular Weight	73.923	111.118
BTU / Lb.	20903	20463
BTU / Gal.	110004	124125
Cu. Ft. / Gal. At 14.73 Psia, 60°F	26.953	20.717
Lbs. / Gal. (Absolute Density)	5.2624	6.0662
Lbs. / Gal. (Weight in Air)	5.2566	6.0595
Specific Gravity at 60°F (Water = 1)	0.6312	0.7276
API Gravity at 60°F	92.676	62.974

Chris Staley

Hydrocarbon Laboratory Manager

HOUSTON LABORATORIES
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CERTIFICATE OF ANALYSIS

Number : 2012120659-001A

JW Measurement
Deborah Murphy
669 Aero Dr.

Shreveport, LA 71107

Field:	Marshall , WV	**Report Date:**	12/31/12
Station Name:	Majorsville A	**Sample Of:**	Spot / Liquid
Station No.:		**Sample Date:**	12/13/2012
Sample Point:		**Sample Conditions:**	205 psig @ 55 °F
Cylinder # :	13873	**PO / Ref. No.:**	

Comments:

ANALYTICAL DATA

Components	Mol %	Wt%	LV%	Method	Lab Tech.	Date Analyzed
				GPA-2186	JL	12/31/12
Nitrogen	NIL	NIL	NIL	(MC10)		
Methane	5.404	1.173	2.469			
Carbon Dioxide	NIL	NIL	NIL			
Ethane	9.472	3.853	6.826			
Propane	12.270	7.320	9.110			
iso Butane	3.427	2.695	3.022			
n-Butane	10.945	8.605	9.297			
iso Pentane	5.484	5.353	5.405			
n-Pentane	7.731	7.546	7.552			
i-Hexanes	6.862	7.974	7.556			
n-Hexane	6.473	7.609	7.228			
Benzene	0.107	0.115	0.083			
Cyclohexane	0.839	0.959	0.772			
i-Heptanes	7.277	9.803	8.889			
n-Heptane	4.410	6.014	5.519			
Toluene	0.489	0.615	0.444			
i-Octanes	8.194	12.148	10.446			
n-Octane	2.210	3.437	3.073			
*e-Benzene	0.103	0.150	0.107			
*m,o,&p-Xylene	0.798	1.155	0.842			
i-Nonanes	2.953	5.049	4.274			
n-Nonane	0.998	1.744	1.527			
i-Decanes	1.535	2.772	2.198			
n-Decane Plus	2.019	3.911	3.361			
Totals	100.000	100.000	100.000			

Calculated Values	TOTAL	C6+	C7+	C10+
Molecular Weight	73.923	103.627	111.118	138.645
BTU / Lb.	20903	20573	20463	20280
BTU / Gal.	110004	121980	124125	128244
Cu. Ft. / Gal. At 14.73 Psia, 60°F	26.953	21.713	20.717	17.318
Lbs. / Gal. (Absolute Density)	5.2624	5.9293	6.0662	6.3269
Lbs. / Gal. (Weight in Air)	5.2566	5.9227	6.0595	6.3199
Specific Gravity at 60°F (Water = 1)	0.6312	0.7112	0.7276	0.7589
API Gravity at 60°F	92.676	67.464	62.974	54.960

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PHONE (713) 660-0901

CERTIFICATE OF ANALYSIS

Number : 2012120659-001A

JW Measurement
Deborah Murphy
669 Aero Dr.

Shreveport, LA 71107

Field:	Marshall , WV	**Report Date:**	12/31/12
Station Name:	Majorsville A	**Sample Of:**	Spot / Liquid
Station No.:		**Sample Date:**	12/13/2012
Sample Point:		**Sample Conditions:**	205 psig @ 55 °F
Cylinder # :	13873	**PO / Ref. No.:**	

Comments:

Components	Mol %	Wt%	LV%	Method	Lab Tech.	Date Analyzed
				GPA-2186	JL	12/31/12
Nitrogen	0.000	0.000	0.000	(MC10)		
Methane	5.404	1.173	2.469			
Carbon Dioxide	0.000	0.000	0.000			
Ethane	9.472	3.853	6.826			
Propane	12.270	7.320	9.110			
I-butane	3.427	2.695	3.022			
n-Butane	10.945	8.605	9.297			
i-Pentane	5.484	5.353	5.405			
n-Pentane	7.731	7.546	7.552			
2,2-dimethylbutane	0.303	0.357	0.344			
2,3-dimethylbutane	0.298	0.350	0.331			
Cyclopentane	0.369	0.350	0.294			
2-methylpentane	3.515	4.126	3.955			
3-methylpentane	2.377	2.791	2.632			
N-Hexane	6.473	7.609	7.228			
2,2-dimethylpentane	0.168	0.226	0.211			
Methylcyclopentane	0.513	0.588	0.491			
2,4-dimethylpentane	0.294	0.399	0.371			
2,2,3-trimethylbutane	0.056	0.074	0.067			
Benzene	0.107	0.115	0.083			
3,3-dimethylpentane	0.130	0.178	0.161			
Cyclohexane	0.839	0.959	0.772			
2-methylhexane	2.871	3.918	3.618			
2,3-dimethylpentane	0.098	0.131	0.117			
1,1-dimethylcyclopentane	0.000	0.000	0.000			
3-methylhexane	2.475	3.378	3.080			
1,t3-dimethylcyclopentane	0.000	0.000	0.000			
1,c3-dimethylcyclopentane	0.126	0.169	0.144			
3-ethylpentane	0.014	0.019	0.017			
1,t2-dimethylcyclopentane	0.485	0.651	0.545			
2,2,4-trimethylpentane	0.047	0.072	0.067			
N-Heptane	4.410	6.014	5.519			
Methylcyclohexane	2.000	2.673	2.182			
1,1,3-trimethylcyclopentane	0.135	0.208	0.173			
2,2-dimethylhexane	0.056	0.089	0.080			
1,c2-dimethylcyclopentane	0.215	0.287	0.234			
2,5-dimethylhexane	0.308	0.478	0.431			
2,4-dimethylhexane	0.093	0.143	0.127			
ethylcyclopentane	0.298	0.400	0.327			
2,2,3-trimethylpentane	0.019	0.029	0.024			
1,t2,c4-trimethylcyclopentane	0.154	0.233	0.197			
3,3-dimethylhexane	0.010	0.012	0.010			
1,t2,c3-trimethylcyclopentane	0.037	0.058	0.047			
2,3,4-trimethylpentane	0.023	0.035	0.030			

HOUSTON LABORATORIES
8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

CERTIFICATE OF ANALYSIS

Number : 2012120659-001A

JW Measurement
Deborah Murphy
669 Aero Dr.

Shreveport, LA 71107

Field:	Marshall , WV	**Report Date:**	12/31/12
Station Name:	Majorsville A	**Sample Of:**	Spot / Liquid
Station No.:		**Sample Date:**	12/13/2012
Sample Point:		**Sample Conditions:**	205 psig @ 55 °F
Cylinder # :	13873	**PO / Ref. No.:**	

Comments:

Components	Mol %	Wt%	LV%	Method	Lab Tech.	Date Analyzed
				GPA-2186	JL	12/31/12
Toluene	0.489	0.615	0.444	(MC10)		
2,3-dimethylhexane	0.308	0.478	0.421			
1,1,2-trimethylcyclopentane	0.000	0.000	0.000			
2-methylheptane	1.958	3.046	2.736			
4-methylheptane	0.000	0.000	0.000			
3,4-dimethylhexane	0.000	0.000	0.000			
3-methylheptane	1.548	2.409	2.141			
3-ethylhexane	0.000	0.000	0.000			
1,c3-dimethylcyclohexane	0.396	0.605	0.494			
1,c2,t3-trimethylcyclopentane	0.201	0.303	0.247			
1,c2,t4-trimethylcyclopentane	0.201	0.303	0.247			
1,t4-dimethylcyclohexane	0.112	0.169	0.140			
2,2,5-trimethylhexane	0.000	0.000	0.000			
1,1-dimethylcyclohexane	0.019	0.030	0.024			
1-methyl,t3-ethylcyclopentane	0.014	0.020	0.017			
1-methyl,c3-ethylcyclopentane	0.000	0.000	0.000			
1-methyl,t2-ethylcyclopentane	0.047	0.070	0.057			
2,2,4-trimethylhexane	0.042	0.070	0.060			
1-methyl,1-ethylcyclopentane	0.000	0.000	0.000			
Cycloheptane	0.000	0.000	0.000			
N-Octane	2.210	3.437	3.073			
1,t2-dimethylcyclohexane	0.116	0.181	0.147			
Unknown C9 paraffin	0.000	0.000	0.000			
1,t3-dimethylcyclohexane	0.056	0.085	0.067			
1,c4-dimethylcyclohexane	0.056	0.085	0.067			
1,c2,c3-trimethylcyclopentane	0.056	0.085	0.067			
Isopropylcyclopentane	0.010	0.016	0.014			
2,3,5-trimethylhexane	0.010	0.016	0.014			
2,2-dimethylheptane	0.000	0.000	0.000			
2,4-dimethylheptane	0.014	0.025	0.024			
1-methyl,c2-ethylcyclopentane	0.014	0.025	0.020			
2,2,3-trimethylhexane	0.051	0.087	0.057			
1,c2-dimethylcyclohexane	0.107	0.163	0.127			
2,6-dimethylheptane	0.023	0.041	0.037			
N-Propylcyclopentane	0.079	0.122	0.097			
1,c3,c5-trimethylcyclohexane	0.070	0.122	0.100			
2,5-dimethylheptane	0.084	0.150	0.130			
3,5-dimethylheptane	0.084	0.150	0.130			
Ethylcyclohexane	0.000	0.000	0.000			
1,1,3-trimethylcyclohexane	0.121	0.209	0.167			
2,3,3-trimethylhexane	0.079	0.140	0.123			
3,3-dimethylheptane	0.201	0.348	0.301			
1,1,4-trimethylcyclohexane	0.000	0.000	0.000			

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CERTIFICATE OF ANALYSIS

Number : 2012120659-001A

JW Measurement
Deborah Murphy
669 Aero Dr.

Shreveport, LA 71107

Field:	Marshall , WV	**Report Date:**	12/31/12
Station Name:	Majorsville A	**Sample Of:**	Spot / Liquid
Station No.:		**Sample Date:**	12/13/2012
Sample Point:		**Sample Conditions:**	205 psig @ 55 °F
Cylinder # :	13873	**PO / Ref. No.:**	

Comments:

Components	Mol %	Wt%	LV%	Method	Lab Tech.	Date Analyzed
				GPA-2186	JL	12/31/12
Unknown C9 paraffin	0.000	0.000	0.000	(MC10)		
2,3,4-trimethylhexane	0.000	0.000	0.000			
Ethylbenzene	0.103	0.150	0.107			
1,t2,t4-trimethylcyclohexane	0.061	0.108	0.087			
2,3-dimethylheptane	0.000	0.000	0.000			
1,c3,t5-trimethylcyclohexane	0.000	0.000	0.000			
m-Xylene	0.364	0.527	0.384			
p-Xylene	0.364	0.527	0.384			
3,4-dimethylheptane	0.014	0.022	0.020			
2-methyloctane	0.429	0.749	0.658			
4-methyloctane	0.429	0.749	0.652			
Unknown C9 naphthene	0.000	0.000	0.000			
3-methyloctane	0.611	1.066	0.929			
Unknown C9 naphthene	0.000	0.000	0.000			
Unknown C9 naphthene	0.000	0.000	0.000			
1,t2,c3-trimethylcyclohexane	0.010	0.018	0.014			
1,t2,c4-trimethylcyclohexane	0.010	0.018	0.014			
o-Xylene	0.070	0.101	0.074			
1,1,2-trimethylcyclohexane	0.158	0.269	0.211			
Unknown C9 naphthene	0.000	0.000	0.000			
Unknown C9 naphthene	0.000	0.000	0.000			
N-Nonane	0.998	1.744	1.527			
Unknown C10 paraffin	0.047	0.092	0.077			
Unknown C10 paraffin	0.051	0.098	0.083			
Unknown C9 naphthene	0.000	0.000	0.000			
1,c2,t3-trimethylcyclohexane	0.037	0.067	0.054			
1,c2,c3-trimethylcyclohexane	0.037	0.067	0.054			
Unknown C10 paraffin	0.023	0.041	0.037			
Unknown C10 paraffin	0.000	0.000	0.000			
Isopropylbenzene	0.107	0.177	0.130			
2,2-dimethyloctane	0.023	0.047	0.040			
Isopropylcyclohexane	0.033	0.059	0.047			
Cyclooctane	0.037	0.059	0.043			
Unknown C10 paraffin	0.000	0.000	0.000			
Unknown C10 paraffin	0.000	0.000	0.000			
N-Butylcyclopentane	0.033	0.058	0.047			
N-Propylcyclohexane	0.033	0.058	0.047			
3,3-dimethyloctane	0.014	0.025	0.020			
Unknown C10 paraffin	0.023	0.046	0.040			
Unknown C10 paraffin	0.014	0.030	0.026			
N-Propylbenzene	0.033	0.051	0.037			
Unknown C10 paraffin	0.005	0.009	0.007			
m-Ethyltoluene	0.037	0.062	0.043			

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Cylinder # :	13873	**PO / Ref. No.:**	

Comments:

Components	Mol %	Wt%	LV%	Method	Lab Tech.	Date Analyzed
				GPA-2186	JL	12/31/12
p-Ethyltoluene	0.000	0.000	0.000			
2,3-dimethyloctane	0.000	0.000	0.000			
4-methylnonane	0.079	0.149	0.127			
5-methylnonane	0.037	0.074	0.064			
1,3,5-trimethylbenzene	0.047	0.074	0.054			
2-methylnonane	0.247	0.476	0.411			
3-ethyloctane	0.033	0.060	0.050			
o-Ethyltoluene	0.089	0.143	0.100			
3-methylnonane	0.075	0.143	0.123			
Unknown C10 aromatic	0.196	0.360	0.254			
Unknown C10 aromatic	0.023	0.042	0.030			
Unknown C10 paraffin	0.005	0.009	0.007			
Unknown C10 paraffin	0.000	0.000	0.000			
Unknown C10 paraffin	0.000	0.000	0.000			
1,2,4-trimethylbenzene	0.047	0.073	0.054			
tert-Butylbenzene	0.019	0.036	0.026			
Methylcyclooctane	0.023	0.036	0.026			
tert-Butylcyclohexane	0.023	0.042	0.033			
Isobutylcyclohexane	0.005	0.009	0.007			
N-Decane Plus	2.019	3.911	3.361			
	100.000	100.000	100.000			

Hydrocarbon Laboratory Manager

J-W Measurement Company
Shreveport,LA Tyler,TX Victoria,TX Midland,TX
Fairfield,TX Oklahoma City,OK Mounds,OK Tulsa,OK
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888-226-9110

JWMC Number:	NOEK1011	***Run Date:***	11/13/12
Customer Name:	NOBLE ENERGY		
Station Name:	SHL 3-B	***Eff. Date:***	12/1/2012
Station Number:	G05101365	***Sampled by:***	AR
Producer:		***Procure Date:***	11/06/12
Field:	MARCELLUS SAHLE	***Pressure (lbs.):***	286.00
Co. or Pr.:	MARSHALL	***Temperature (^{o}F):***	97
State:	WV.	***Bottle Number:***	4793

Remarks:

Component	***Mole Percent***	***GPM @ 14.696***	***Ideal BTU @ 14.696***
Hydrogen Sulfide	0.0001		
Nitrogen	0.3429		
Methane	78.4994		792.84
Carbon Dioxide	0.1218		0.00
Ethane	14.4282	3.849	255.34
Propane	4.2648	1.172	107.31
I-Butane	0.5059	0.165	16.45
N-Butane	1.0173	0.320	33.19
I-Pentane	0.2517	0.092	10.07
N-Pentane	0.2439	0.088	9.78
2,2-Dimethylbutane	0.0084	0.003	0.40
2,3-Dimethylbutane	0.0127	0.005	0.60
2-Methylpentane	0.0596	0.025	2.83
3-Methylpentane	0.0374	0.015	1.78
n-Hexane	0.0740	0.030	3.52
2,2-Dimethylpentane	0.0015	0.001	0.08
Methylcyclopentane	0.0089	0.003	0.40
Benzene	0.0012	0.000	0.04
3,3-Dimethylpentane	0.0000	0.000	0.00
Cyclohexane	0.0068	0.002	0.30
2-Methylhexane	0.0247	0.011	1.36
2,3 dimethylpentane	0.0046	0.002	0.25
3- methylhexane	0.0177	0.008	0.97
1t,2-Dimethylcyclopentane	0.0008	0.000	0.04
1c,2-Dimethycyclopentane	0.0002	0.000	0.01
n-heptane	0.0217	0.010	1.19
Methylcyclohexane	0.0117	0.005	0.61
2,5-Dimethylhexane	0.0011	0.001	0.07
2,4-Dimethyhexane	0.0016	0.001	0.10
Toluene	0.0028	0.001	0.13
2-Methylheptane	0.0044	0.002	0.27
4-Methylheptane	0.0025	0.001	0.16

We appreciate your business

J-W Measurement Company
Shreveport,LA Tyler,TX Victoria,TX Midland,TX
Fairfield,TX Oklahoma City,OK Mounds,OK Tulsa,OK
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888-226-9110

Customer Name:	NOBLE ENERGY				
Station Name:	SHL 3-B			***Eff. Date:***	12/1/2012
Station Number:	G05101365			***Sampled by:***	AR
3-Methylheptane		0.0026	0.001		0.16
1c,2-Dimethycyclohexane		0.0015	0.001		0.09
N-Octane		0.0056	0.003		0.35
1t,2-Dimethylcyclohexane		0.0000	0.000		0.00
1t,3-Dimethylcyclohexane		0.0000	0.000		0.00
1c,3-Dimethylcyclohexane		0.0006	0.000		0.04
Ethylcyclohexane		0.0005	0.000		0.03
Ethylbenzene		0.0000	0.000		0.00
M-Xylene		0.0027	0.001		0.14
P-Xylene		0.0015	0.001		0.08
O-Xylene		0.0000	0.000		0.00
N-Nonane		0.0023	0.001		0.16
Decanes		0.0019	0.001		0.15
Undecanes		0.0005	0.000		0.04
TOTAL		**100.0000**	**5.823**		**1241.33**
Ideal Gravity	0.7079		**Real Gravity**	0.7104	
Compressibility Factor (Z) @ 14.696 PSIA & 60 DEG. F =					0.9965
Base Pressures		**14.73**	**14.65**		**15.025**
GPM		5.837	5.805		5.954
Ideal BTU Dry		1244.20	1237.45		1269.12
Ideal BTU Sat.		1222.55	1215.79		1247.42
Real BTU Dry		1248.52	1241.72		1273.61
Real BTU Sat.		1226.80	1219.99		1251.84

Note: Calibration, Standards, and testing procedures
are achieved pursuant to GPA regulations.

J-W ANALYST

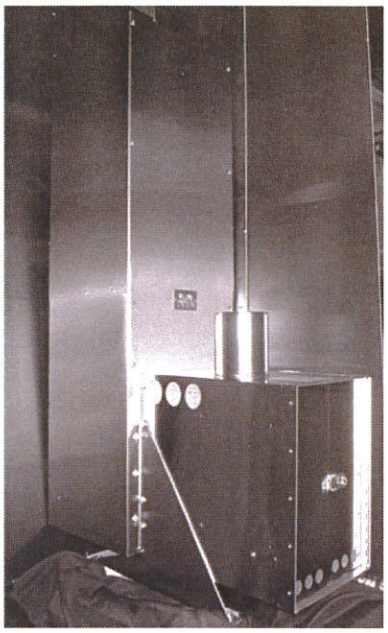
This Analysis Report is not intended for submission to Louisiana Department of Environmental Quality.

DISTRIBUTION:

1	35

We appreciate your business

Model 5220 Thermoelectric Generators



Global Thermoelectric's Model 5220 Thermoelectric Generator contains no moving parts. It is a reliable, low maintenance source of DC electrical power for any application where regular utilities are unavailable or unreliable.

Power Specifiations

Power Rating at 20°C

195 Watts at 12 Volts

178 Watts at 24 Volts

Electrical

Adjustment:	12 V	12 -18 Volts
	24 V	24 - 30 Volts

Reverse current protection included.

Output: Terminal block which accepts up to 8 AWG wire. Opening for 3/4" conduit in the base of the cabinet.

Fuel

Natural Gas:	19.7 m^3/day (700 Sft^3/day)
	1000 BTU/Sft^3 (37.7 MJ/SM^3) gas
	max 115 mg/Sm^3 (~170 ppm) H_2S
	max 120 mg/Sm^3 H_2O
	max 1% free O_2
Propane:	28.0 l/day (7.4 US gal/day)
Max. Supply Pressure:	345 kPa (50 psi)
Min. Supply Pressure:	165 kPa (24 psi)
Fuel Connection:	1/4" MNPT

Environmental

Ambient Operation Temperature: Max. 45°C (115°F) Min. -40°C (-40°F).

Operating Conditions: Unsheltered operation

Please contact Global for operating conditions below -40°C or above +45°C.

Materials of Construction

Cabinet:	304 SS
Cooling Type:	Natural Convection
Fuel System:	Brass, Aluminum & SS

Certified To CSA Std T.I.L. R-10

Rev 01-14

Standard Features

- Automatic Spark Ignition (SI)
- Automatic Fuel Shut-off (SO)
- Fuel Filter
- Low Voltage Alarm Contacts (VSR)
- Volt & Amp Meter

Optional Features

- Cathodic Protection Interface
- Pole Mount or Bench stand
- Corrosive Environment Fuel System
- Marine Service

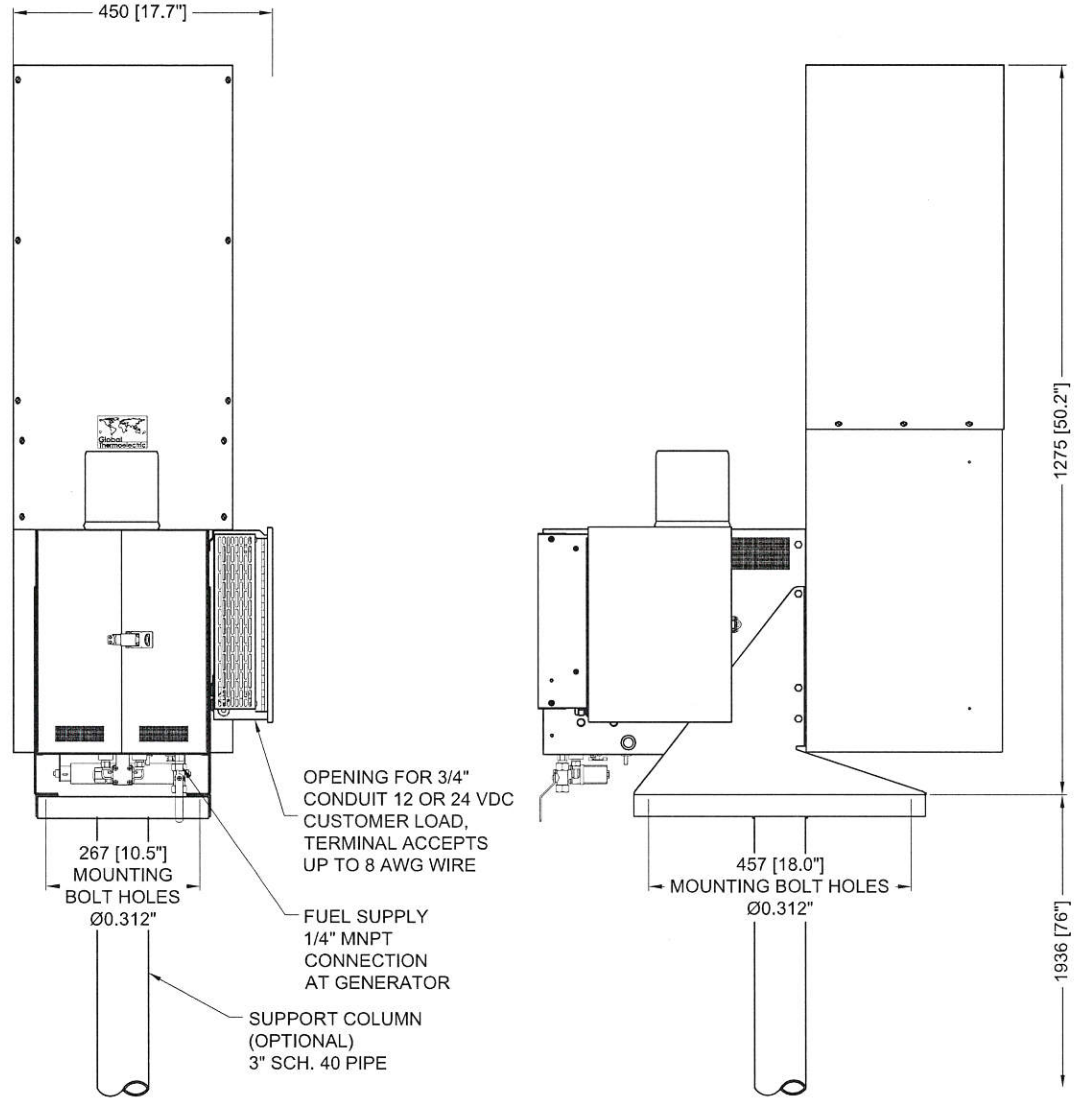
Note: Specifications shown are for standard configurations. Global Thermoelectric's Integrated Systems Engineering Department is available to design custom voltages, fuel supply systems and non-standard operating temperatures.

Global Thermoelectric
ISO Registered 9001:2008

CANADA EXPORT AWARD

CSA®

Typical Installation



NOTES:
1. GENERATOR WEIGHT: 97 kg [214 lb]
2. DIMENSIONS IN mm [INCHES].

Global Thermoelectric

Power where you need it.®

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Houston, TX 77238
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Fax: (281) 445-6060
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ATTACHMENT U

Emission Summary Sheet

ATTACHMENT U – FACILITY-WIDE CONTROLLED EMISSIONS SUMMARY SHEET

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

Emission Point ID#	NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		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
8E-COMB *(1STK5-8, 2STK1-4, 13S-TK9)*	---	---	---	---	3.25	14.23	---	---	---	---	---	---	0.45	1.98	11.33	49.61
8E-COMB *(6S-TL1, 7S-TL2,14S-TL3)*	---	---	---	---	0.67	0.18	---	---	---	---	---	---	---	---	---	---
8E-COMB	0.86	3.75	0.72	3.15	2.7E-04	1.2E-03	0.01	0.02	0.07	0.29	0.07	0.29	0.00	0.00	1,023.13	4,481.29
10E-COMB	1.79	7.83	8.15	35.68	0.05	0.22	---	---	---	---	---	---	0.00	0.00	3,075.82	13,472.11
4E-GPU1	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU2	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU3	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU4	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU5	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU6	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU7	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU8	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
4E-GPU9	0.08	0.35	0.07	0.29	4.4E-03	0.02	4.8E-04	2.1E-03	0.01	0.03	0.01	0.03	0.00	0.01	117.12	512.98
5E-LP	0.06	0.26	0.05	0.22	3.3E-03	0.01	3.6E-04	1.6E-03	0.00	0.02	0.00	0.02	0.00	0.01	87.84	384.73
12E-TEGEN	7.8E-04	3.4E-03	4.5E-04	2.0E-03	6.0E-05	2.6E-04	6.0E-06	2.6E-05	4.2E-05	1.8E-04	4.2E-05	1.8E-04	0.00	0.00	0.77	3.36
6E-TL1, 6E-TL2, 14S-TL3	---	---	---	---	14.46	3.76	---	---	---	---	---	---	---	---	---	---
Fugitives	---	---	---	---	---	13.62	---	---	---	---	---	---	---	37.69	---	942.31
Haul Roads	---	---	---	---	---	---	---	---	---	2.07	---	0.21	---	---	---	---
Facility Total	3.43	15.00	9.52	41.70	18.48	32.19	0.01	0.04	0.12	2.62	0.12	0.75	0.47	39.77	5,252.95	23,950.21
Facility Total (Excluding Fugitives Emissions)	3.43	15.00	9.52	41.70	18.48	18.57	0.01	0.04	0.12	0.55	0.12	0.55	0.47	2.08	5,252.95	23,007.90

Annual emissions shall be based on 8,760 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 HAP 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
8E-COMB *(1STK5-8, 2STK1-4, 13S-TK9)*	---	---	1.8E-03	7.9E-03	1.1E-04	4.7E-04	2.1E-03	9.0E-03	2.2E-04	9.5E-04	4.2E-03	0.02	0.13	0.59
8E-COMB *(6S-TL1, 7S-TL2,14S-TL3)*	---	---	5.9E-05	1.5E-05	6.2E-04	1.6E-04	2.6E-05	6.8E-06	1.4E-03	3.7E-04	2.4E-03	6.2E-04	0.03	0.01
8E-COMB	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10E-COMB	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4E-GPU1	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	0.00	0.01	0.00	0.01
4E-GPU2	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	0.00	0.01	0.00	0.01
4E-GPU3	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	0.00	0.01	0.00	0.01
4E-GPU4	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	0.00	0.01	0.00	0.01
4E-GPU5	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	0.00	0.01	0.00	0.01
4E-GPU6	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	0.00	0.01	0.00	0.01
4E-GPU7	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	0.00	0.01	0.00	0.01
4E-GPU8	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	0.00	0.01	0.00	0.01
4E-GPU9	6.0E-05	2.6E-04	1.7E-06	7.4E-06	2.7E-06	1.2E-05	---	---	---	---	0.00	0.01	0.00	0.01
5E-LP	4.5E-05	2.0E-04	1.3E-06	5.5E-06	2.0E-06	8.9E-06	---	---	---	---	1.1E-03	4.7E-03	1.1E-03	5.0E-03
12E-TEGEN	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6E-TL1, 6E-TL2, 14E-TL3	---	---	0.00	0.00	0.01	0.00	5.6E-04	1.5E-04	3.1E-02	8.0E-03	0.05	0.01	0.61	0.16
Fugitives	---	---	---	0.00	---	0.01	---	0.0E+00	---	0.02	---	0.25	0.00	0.46
Haul Roads	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Facility Total	**5.9E-04**	**2.6E-03**	**3.1E-03**	**0.01**	**0.01**	**0.01**	**2.7E-03**	**9.2E-03**	**0.03**	**0.03**	**0.08**	**0.38**	**0.78**	**1.28**
Facility Total (Excluding Fugitives Emissions)	**5.9E-04**	**2.6E-03**	**3.1E-03**	**0.01**	**1.4E-02**	**4.2E-03**	**2.7E-03**	**9.2E-03**	**3.3E-02**	**9.3E-03**	**0.08**	**0.13**	**0.78**	**0.82**

Annual emissions shall be based on 8,760 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 – CLASS I LEGAL ADVERTISEMENT

Publication of a proper Class I legal advertisement is a requirement of the G70-D registration process. In the event the applicant's legal advertisement fails to follow the requirements of 45CSR13, Section 8 or the requirements of Chapter 59, Article 3, of the West Virginia Code, the application will be considered incomplete and no further review of the application will occur until this is corrected.

The applicant, utilizing the format for the Class I legal advertisement example provided on the following page, shall have the legal advertisement appear a minimum of one (1) day in the newspaper most commonly read in the area where the facility exists or will be constructed. The notice must be published no earlier than five (5) working days of receipt by this office of your application. The original affidavit of publication must be received by this office no later than the last day of the public comment period.

The advertisement shall contain, at a minimum, the name of the applicant, the type and location of the source, the type and amount of air pollutants that will be discharged (excluding fugitive emissions), the nature of the permit being sought, the proposed start-up date for the source, and a contact telephone number for more information.

The location of the source should be as specific as possible starting with: 1.) the street address of the source; 2.) the nearest street or road; 3.) the nearest town or unincorporated area, 4.) the county, and 5.) latitude and longitude coordinates in decimal format.

Types and amounts of pollutants discharged **must include** all regulated pollutants (Nitrogen Oxides, Carbon Monoxide, Particulate Matter-2.5, Particulate Matter-10, Volatile Organic Compounds, Sulfur Dioxide, Carbon Dioxide Equivalents, Methane, Formaldehyde, Benzene, Toluene, Ethylbenzene, Xylenes, Hexane, Total Hazardous Air Pollutants and their potential to emit or the permit level being sought in units of tons per year.

In the event the 30th day is a Saturday, Sunday, or legal holiday, the comment period will be extended until 5:00 p.m. on the following regularly scheduled business day.

A list of qualified newspapers that are eligible to publish legal ads may be found:

http://www.sos.wv.gov/elections/resource/Documents/Qualified%20Newspapers.pdf

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that CNX Gas Company LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a G70-D General Permit Registration for an existing natural gas production facility, Pennsboro 1 (PEN1), located approximately 3 miles northeast of Pennsboro, in Ritchie County, West Virginia. The latitude and longitude coordinates are: 39.33494 N, -80.99283 W.

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

Pollutant	Emissions in tpy (tons per year)
NOx	15.00
CO	41.70
VOC	18.57
SO_2	0.04
PM	0.55
Formaldehyde	2.6E-03
Benzene	0.01
Toluene	0.01
Ethylbenzene	9.2E-03
Xylene	0.03
n-Hexane	0.38
Total HAPs	1.28
Carbon Dioxide Equivalents (CO_2e)	23,007.90

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)** day of **(Month)**, 2016.

By: CNX Gas Company LLC
Carol Phillips, Midstream Permitting Manager
1000 CONSOL Energy Drive
Canonsburg, PA 15317

ATTACHMENT W

General Permit Registration Application Fee