PROJECT REPORT

Triad Hunter, LLC
Wells Meckley Wellpad

G70-D Permit Application

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Trinity Consultants

Environmental solutions delivered uncommonly well

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Triad Hunter, LLC (Triad), a subsidiary of Blue Ridge Mountain Resources, is submitting this Class II General Permit (G70-D) application to the West Virginia Department of Environmental Protection (WVDEP) for construction and operation of equipment at a natural gas production wellpad located in Tyler County, West Virginia (Wells Meckley Wellpad).

1.1. FACILITY AND PROJECT DESCRIPTION

The Wells Meckley wellpad is a natural gas production facility that will consist of five (5) Marcellus natural gas wells and one (1) Utica natural gas well. Natural gas and liquids (including water and condensate) are extracted from deposits underneath the surface. Natural gas is transported from the well to the gas line for additional processing and compression, as necessary. The liquids produced are stored in storage vessels.

Triad plans to install the following equipment at the facility:

- Four (4) 500 barrel (bbl) condensate storage tanks; controlled by one (1) enclosed combustor rated at 10 million British thermal units per hour (MMBtu/hr);
- Four (4) 500 bbl produced water storage tanks; controlled by the aforementioned enclosed combustor;
- Six (6) gas processing unit heaters, each rated at 2.0 MMBtu/hr;
- Two (2) heater treaters, each rated at 1.0 MMBtu/hr;
- Two (2) natural gas-fired 1,380 horsepower (hp) Caterpillar 3516B LE compressor engines, each equipped with an oxidation catalyst for emissions control;
- One (1) natural gas-fired 206 hp Caterpillar 3306B TA flash gas compressor engine, equipped with an oxidation catalyst for emissions control;
- One (1) natural gas-fired 52.4 hp vapor recovery unit (VRU) engine, equipped with an oxidation catalyst;
- One (1) triethylene glycol (TEG) natural gas dehydration unit with flash tank, rated at 42 million standard cubic feet per day (MMscf). Emissions from the dehydration unit still vent will be controlled by a condenser and routed to the reboiler burner. Emissions from the flash tank will be routed to the aforementioned enclosed combustor;
- One (1) reboiler heater for the dehydration unit, rated at 0.75 MMBtu/hr;
- Condensate and produced water truck loading. Truck loading will be vapor balanced, with emissions controlled by the aforementioned enclosed combustor;
- Associated piping and fugitive components; and
- Haul road activity.

A process flow diagram is included as Attachment D. A comparison of the potential emissions of the proposed 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 (other than hazardous air pollutants [HAP]) are not considered in determining eligibility for 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	25.21	50
Carbon Monoxide	19.02	80
Volatile Organic Compounds	61.15	80
Particulate Matter – 10/2.5	1.83	20
Sulfur Dioxide	0.12	20
Individual HAP (formaldehyde)[1]	2.79	8
Total HAP[1]	6.70	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) and the United State Environmental Protection Agency's (U.S. EPA's) 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 Wells Meckley Wellpad for air permitting purposes if, and only if, all three elements of the "stationary source" definition above are fulfilled.

There are no Marcellus or Utica natural gas production facilities within a quarter mile radius from the Wells Meckley wellpad. Therefore, the Wells Meckley wellpad should be considered a separate stationary source with respect to permitting programs, including Title V and Prevention of Significant Deterioration (PSD). As discussed in this application, the Wells Meckley wellpad 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: Emission Source Calculation Methodology;
- Section 3: Regulatory Discussion;
- Section 4: G70-D Application Forms;
- 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 / Emission Reduction Devices Table;
- Attachment J: Fugitive Emissions Summary Sheet;
- Attachment K: Gas Well Affected Facility Data Sheet;
- Attachment L: Storage Vessel Data Sheet;
- Attachment M: Small Heaters and Reboilers Data Sheet;
- Attachment N: Internal Combustion Engines Data Sheet;
- Attachment O: Tank Truck/Railcar Loading Data Sheet;
- Attachment P: Glycol Dehydration Unit Sheet;
- Attachment Q: Pneumatic Controllers Data Sheet;
- Attachment R: Pneumatic Pump Data Sheet;
- Attachment S: Air Pollution Control Device / Emission Reduction Device Data Sheet;
- Attachment T: Emission Calculations;
- Attachment U: Facility-wide Controlled Emission Summary Sheet;
- Attachment V: Class I Legal Advertisement; and
- Attachment W: General Permit Registration Application Fee.

2. EMISSION SOURCE CALCULATION METHODOLOGY

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 T of this application.

Emissions from this project will result from natural gas combustion in the VRU and compressor engines, heaters, and enclosed combustor, as well as storage of organic liquids in storage tanks and loading of organic liquids into tank trucks. Emissions will also result from dehydration of natural gas in the TEG dehydration unit. 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 are calculated is summarized below.

- **Storage Tanks:** Working, breathing and flashing emissions of volatile organic compounds (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 composition of the condensate and produced water were obtained using a ProMax® back-blending simulation using analyses from a nearby well. The separator gas rate from the sample was 8,292 MCF/day and the condensate throughput rate was 448.2 bbl/day. This results in a ratio of 54 barrels per million standard cubic feet of separator gas. The separator gas and oil were back-blended at this ratio, with an additional 15 bbl/hr of produced water to establish the total wellstream. The condensate and gas analyses used in this simulation are included in Attachment T.

  The overall condensate and produced water throughput rates were developed using engineering estimates, past flowback data for representative wells, and mechanical limits of the selected piping and equipment. Throughput volumes of both condensate and produced water are expected to decline significantly after the first few months of production. Therefore, the emissions rates included in this application represent a true "worst-case" scenario.

- **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. U.S. EPA's AP-42 Chapter 5 Section 2 factors were used for capture efficiency.[1] Vapor-balanced loading will be employed, with captured vapors being routed to the enclosed combustor for a destruction efficiency of 98%.

- **Heaters and Enclosed Combustor:** Potential emissions of criteria pollutants and HAPs are calculated using U.S. EPA's AP-42 factors for natural gas external combustion.[2] These calculations assume a site-specific heat content of natural gas. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.[3]

- **VRU Engine and Compressor Engines:** Potential emissions of oxides of nitrogen (NO_X), carbon monoxide (CO), carbon dioxide (CO_2), and VOC are calculated using vendor data. The remaining criteria pollutants and HAPs are calculated using U.S. EPA's AP-42 factors for natural gas fired engines. These calculations assume a site-specific heat content of natural gas. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.

[1] U.S. EPA AP 42, Fifth Edition, Volume I, Chapter 5.2.1, July 2008.

[2] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 1.4, Natural Gas Combustion, Supplement D, July 1998.

[3] 40 CFR 98 Subpart C, *General Stationary Fuel combustion Sources*, Tables C-1 and C-2.

- **TEG Dehydration Unit:** Potential emissions of VOC, HAP, methane, and CO_2 are calculated using GRI-GLYCalc v4.0 and a site-specific gas composition obtained from the ProMax® simulation.

- **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 total organic compounds (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.

- **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.[5]

[4] 40 CFR 98 Subpart W, *Petroleum and Natural Gas Systems,* Table W-1A.

[5] 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:

- New Source Review 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. NEW SOURCE REVIEW SOURCE CLASSIFICATION

The federal New Source Review (NSR) program regulates the installation of new major sources or major modifications to existing major sources. The NSR permitting regulations are comprised of two (2) programs: 1) Prevention of Significant Deterioration (PSD) for projects located in areas where specified pollutant levels have met National Ambient Air Quality Standards (NAAQS); and 2) Nonattainment New Source Review (NNSR) for projects located in areas where pollutant levels have not attained the corresponding NAAQS.

Tyler County, WV has been designated "in attainment" or "unclassifiable" for all regulated NSR pollutants and is therefore regulated under PSD.[6] Natural gas wellpads are not classified as one of the 28 listed source categories in West Virginia Code of State Rules, Chapter 45, Series 14 (45 CSR 14), Section 2.43.a, and are therefore subject to the general PSD major source threshold of 250 tpy provided in 45 CSR 14-2.43.b.

The Wells Meckley Wellpad will not be a major source with respect to the PSD program since potential emissions of all regulated pollutants are below the respective PSD thresholds. As such, PSD permitting is not triggered by this construction activity.

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 codified in 45 CSR 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

[6] Attainment designations for West Virginia counties are established in 40 CFR 81.349.

threshold(s) at this facility after the proposed project. Therefore, the Wells Meckley 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 Subparts 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. 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). The subpart does not apply to storage vessels with a capacity less than or equal to 1,589.874 m^3 (420,000 gallons) used for petroleum or condensate stored, processed, or treated prior to custody transfer. The proposed storage vessels will be used to store condensate prior to custody transfer and, as such, will be exempt from the requirements of this subpart.

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. The proposed 1,380 hp Caterpillar 3516B LE compressor engines will be SI ICE manufactured after the applicability date of July 1, 2007 (for lean-burn engines with a maximum power rating greater than 500 hp). The proposed 206 hp Caterpillar 3306B TA compressor engine and 52.4 hp VRU engine will be SI ICE manufactured after the applicability date of July 1, 2008 (for engines with a maximum power rating less than 500 hp). Therefore, the proposed engines will be subject to this subpart.

Triad will operate the engines according to the manufacturer's recommended practices and demonstrate compliance with the requirements specified in 40 CFR §60.4244 (testing methods) and 40 CFR §60.4243 (maintenance plan/records and performance testing frequency) for noncertified affected SI ICE at the facility.

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. The proposed equipment at the wellpad will be constructed after September 18, 2015; therefore, the wellpad will not be subject to this rule.

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 affected 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.

The following paragraphs describe the applicability of the rule to affected facilities that will be located at the Wells Meckley Wellpad.

Four (4) reciprocating compressors will be installed at the wellpad. 40 CFR 60.5385a requires owners and operators of affected reciprocating compressors to change the rod packing prior to operating 26,000 hours or prior to 36 months since start up or the last packing replacement. However, according to §60.5365a, compressors located at well sites are not affected facilities under Subpart OOOOa. As such, the proposed compressors will not be affected facilities under this subpart.

There will be four (4) condensate and four (4) produced water storage vessels at the wellpad. The storage vessels at the facility will each have potential VOC emissions greater than 6 tons per year (tpy). As such, per 60.5395a(a)(2), Triad must reduce emissions from the tanks by 95 percent within 60 days after startup. All condensate and produced water storage tanks will be controlled by an enclosed combustor with a destruction efficiency of 98 percent upon startup of the wellpad. Triad will also comply with the closed-vent system requirements in 60.5411a(c) and (d) and the control device requirements in 60.5412a(d).

The collection of fugitive emission sources at the well pad will be an affected facility under 60.5365a(i). Therefore, Triad will be required to monitor all fugitive emission components (ex. connectors, flanges, etc.) with an optical gas imaging (OGI) device, and repair all sources of fugitive emissions in accordance with the rule. Triad must also develop a monitoring plan for each company-defined area (or one plan that incorporates all required elements), and conduct surveys on a semi-annual basis. Triad is also subject to the applicable recordkeeping and reporting requirements of the rule.

All proposed pneumatic controllers at the facility will be intermittent bleed and, as such, not affected facilities under this subpart. Per 60.5365a(h)(1), a pneumatic pump for well sites is defined as a single natural gas-driven diaphragm pump. The definition specifically excludes lean glycol circulation pumps that rely on energy exchange with the rich glycol from the dehydration unit contactor. The only pneumatic pumps to be installed at the wellpad will be Kimray energy exchange pumps for lean glycol, which will not be subject to this subpart.

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 and associated equipment, 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)). Glycol dehydration units with actual annual benzene emissions less than 0.90 megagrams per year (~1 tpy) are specifically exempt from the substantive requirements of this subpart, per §63.764(e)(1)(ii). Potential emissions of benzene from the proposed dehydration unit are well below 1 tpy. Triad will maintain records of actual annual benzene emissions to confirm that emissions remain below this threshold.

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. 40 CFR §63.6590(c) states that a new or reconstructed stationary RICE located at an area HAP source must meet the requirements of NESHAP Subpart ZZZZ by meeting the requirements of NSPS Subpart JJJJ (or NSPS Subpart IIII, if applicable). No further requirements apply for such engines under NESHAP Subpart ZZZZ. The proposed engines at the wellpad are considered new stationary RICE. Therefore, the requirements contained in §63.6590(c) are applicable. Triad will comply with 40 CFR 63 Subpart ZZZZ by meeting the applicable requirements of 40 CFR 60 Subpart JJJJ.

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 gas processing unit heaters, heater treaters, and reboiler heater are natural gas-fired and are specifically exempt from this subpart. Therefore, this subpart is not applicable to any source at the wellpad.

3.5. WEST VIRGINIA SIP REGULATIONS

The Wells Meckley Wellpad is potentially subject to regulations contained in the West Virginia Code of State Regulations, Chapter 45 (45 CSR). Regulations contained in 45 CSR 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 unit heaters, heater treaters, and reboiler heater 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. Triad will comply with this limitation by combusting only natural gas in these units.

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 processes at the wellpad, production of objectionable odor 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 combustor meets this definition 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 10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

This rule potentially applies to fuel burning units, including the gas processing unit heaters, heater treaters, and reboiler heater. Per 45 CSR 10-10.1, units rated less than 10 MMBtu/hr are exempt from the SO_2 emission limitations. Additionally, these units are exempt from Section 8 (Monitoring, Recording and Reporting) as well as interpretive rule 10A. The proposed heaters at the wellpad will each be rated less than 10 MMBtu/hr and therefore have no requirements under this Rule.

3.5.5. 45 CSR 16: Standards of Performance for New Stationary Sources

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

3.5.6. 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, Triad will take measures to ensure any fugitive particulate matter emissions will not cross the property boundary should any such emissions occur.

3.5.7. 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 proposed petroleum liquid storage tanks.

3.5.8. 45 CSR 34: Emissions Standards for Hazardous Air Pollutants

45 CSR 34-1 incorporates the federal CAA NESHAPs as set forth in 40 CFR Parts 61 and 63 by reference. As such, by complying with all applicable requirements of 40 CFR Parts 61 and 63 at the wellpad, Triad will be complying with 45 CSR 34.

3.5.9. 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

Division of Air Quality
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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): Triad Hunter, LLC

Federal Employer ID No. (FEIN): 494494833

Applicant's Mailing Address: 125 Putnam Street

City: Marietta	State: OH	ZIP Code: 45750

Facility Name: Wells Meckley Wellpad

Operating Site Physical Address: 4883 Tyler Highway (SR18)
If none available, list road, city or town and zip of facility.

City: Sistersville	Zip Code: 26175	County: Tyler

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.53519
Longitude: -80.92280

SIC Code: 1311 NAICS Code: 2111	DAQ Facility ID No. (For existing facilities) N/A

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

I hereby certify that all information contained in this G70-D General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible.

Responsible Official Signature:_____
Name and Title: Daren Rader, Manager – Operations Unconventional Phone: 740-760-0573
Email: drader@brmresources.com Date:

If applicable: N/A
Authorized Representative Signature:_____
Name and Title: Phone: Fax:
Email: Date:

If applicable:
Environmental Contact
Name and Title: Matthew Lewis Phone: 740-868-1327 Fax:
Email: mlewis@brmresources.com Date:

OPERATING SITE INFORMATION
Briefly describe the proposed new operation and/or any change(s) to the facility: Construction and operation of a new natural gas production wellpad consisting of six (6) natural gas wells and associated equipment.
Directions to the facility: From WVDEP in Charleston, WV: Follow I-77 N for approximately 79 miles. Take exit 179 for WV-2 N / WV-68 S / Emerson Ave toward Vienna and turn right onto WV-2 N. Continue on WV-2 N for approximately 32.5 miles. Turn right onto WV-18 S near Sistersville. Continue for approximately 4.9 miles. The wellpad access road is on the north side of WV-18 S.

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 B

Siting Criteria Waiver *(Not Applicable)*

ATTACHMENT B - SITING CRITERIA WAIVER
If applicable, please complete this form and it must be notarized.

Not Applicable

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

State of West Virginia

Certificate

I, Mac Warner, Secretary of State of the State of West Virginia, hereby certify that

TRIAD HUNTER, LLC

was duly authorized under the laws of this state to transact business in West Virginia as a foreign limited liability company on January 29, 2010.

The company is filed as an at-will company, for an indefinite period.

I further certify that the company has not been revoked or administratively dissolved by the State of West Virginia nor has the West Virginia Secretary of State issued a Certificate of Cancellation or Termination to the company.

Accordingly, I hereby issue this Certificate of Authorization

CERTIFICATE OF AUTHORIZATION

Validation ID:4WV48_9NR7X

Given under my hand and the Great Seal of the State of West Virginia on this day of

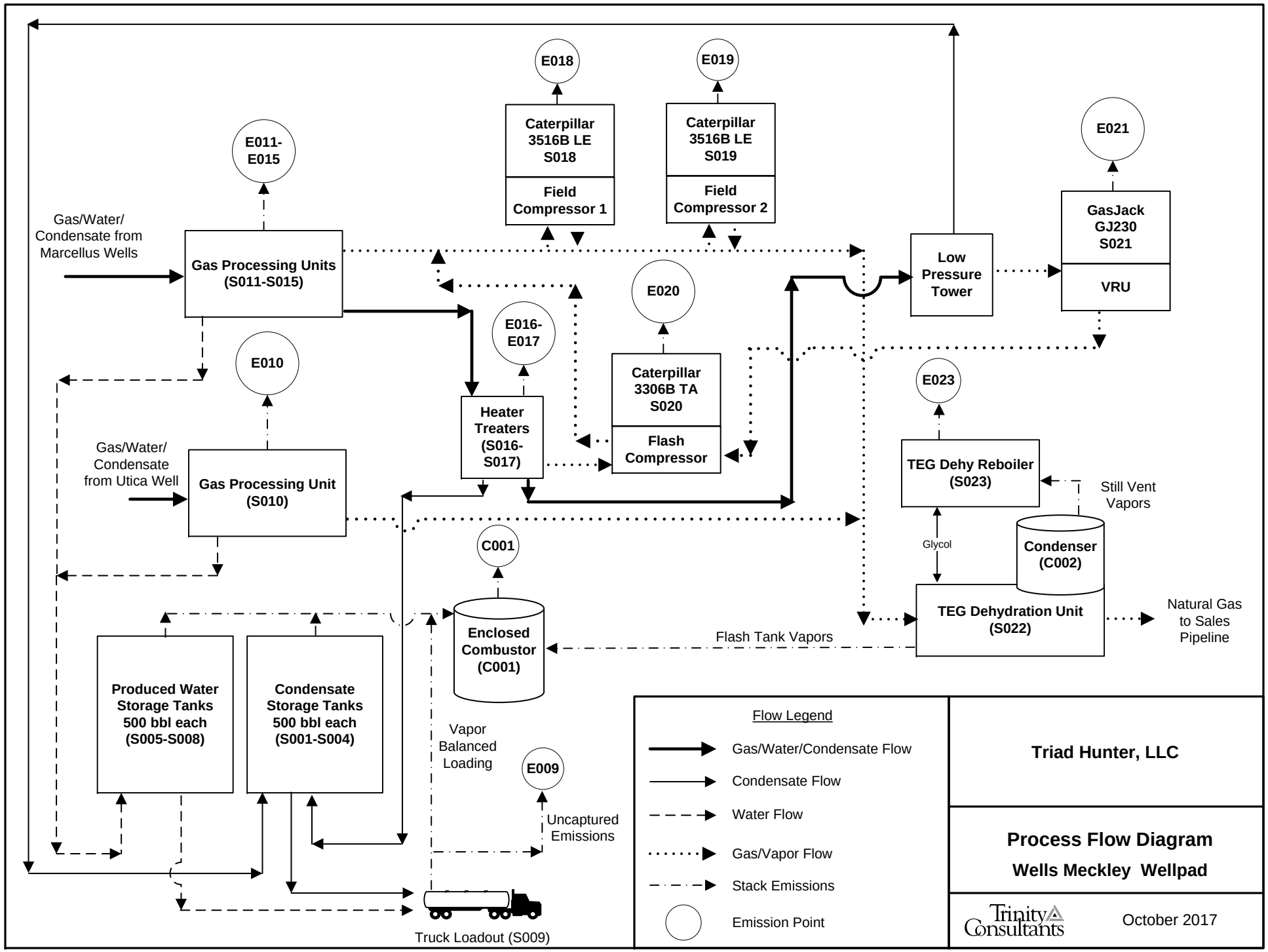
October 24, 2017

Mac Warner

Secretary of State

ATTACHMENT D

Process Flow Diagram


E018
E019
Caterpillar 3516B LE S018
Field Compressor 1
Caterpillar 3516B LE S019
Field Compressor 2
E021
GasJack GJ230 S021
VRU
E011-E015
Gas/Water/ Condensate from Marcellus Wells
Gas Processing Units (S011-S015)
Low Pressure Tower
E020
E016-E017
Caterpillar 3306B TA S020
Flash Compressor
E010
Heater Treaters (S016-S017)
E023
TEG Dehy Reboiler (S023)
Still Vent Vapors
Gas/Water/ Condensate from Utica Well
Gas Processing Unit (S010)
Glycol
Condenser (C002)
C001
TEG Dehydration Unit (S022)
Natural Gas to Sales Pipeline
Enclosed Combustor (C001)
Flash Tank Vapors
Produced Water Storage Tanks 500 bbl each (S005-S008)
Condensate Storage Tanks 500 bbl each (S001-S004)
Vapor Balanced Loading
E009
Uncaptured Emissions
Truck Loadout (S009)
Flow Legend
Gas/Water/Condensate Flow
Condensate Flow
Water Flow
Gas/Vapor Flow
Stack Emissions
Emission Point
Triad Hunter, LLC
Process Flow Diagram
Wells Meckley Wellpad
Trinity Consultants
October 2017

ATTACHMENT E

Process Description

ATTACHMENT E: PROCESS DESCRIPTION

The Wells Meckley Wellpad is a natural gas production facility that will consist of five (5) Marcellus wells, one (1) Utica well, and associated equipment.

The incoming gas/liquid stream from the Utica well will pass through a gas processing unit (GPU) consisting of a heater (S010) to raise/maintain temperature and a three-phase separator to separate gas from produced water. Produced water will be sent to one (1) of four (4) produced water storage vessels (S005 – S008). Natural gas will be sent to a triethylene glycol dehydration unit with a flash tank (S022) to remove water and heavy hydrocarbons from the gas stream. Vapors from the flash tank will be routed to an enclosed combustor (C001) for emissions control. The glycol reboiler still vent will be equipped with a condenser coil (C002) to condense and remove hydrocarbon liquids from the stream. Uncondensed vapors will be routed to the associated reboiler burner (S023) for combustion. During times when the reboiler burner is cycled off, vapors will be routed to a glow plug. Dry gas exiting the dehydration unit will be sent to the sales line.

The incoming gas/liquid stream from the Marcellus wells will pass through a gas processing unit consisting of a heater (S011 – S015) to raise/maintain temperature and a three-phase separator to separate gas from condensate. Produced water will be sent to one (1) of four (4) produced water storage vessels (S005 – S008). Gas from the GPUs will be sent to two (2) field compressors in parallel, which will each be powered by natural gas-fired Caterpillar 3615B LE engines (S018 – S019). A gas/liquids mixture from the GPUs will be routed to two (2) heater treaters (S016 – S017), where it will be heated to volatilize (flash off) lighter hydrocarbons and separate condensate in the liquid stream. The flash gas from the heater treaters will be recovered by a flash gas compressor, which will be powered by a natural gas-fired Caterpillar 3306B TA engine (S020). Compressed gas will then be sent to the two (2) field compressors, then to the dehy, and finally to the sales line. Condensate will be collected in the condensate tanks.

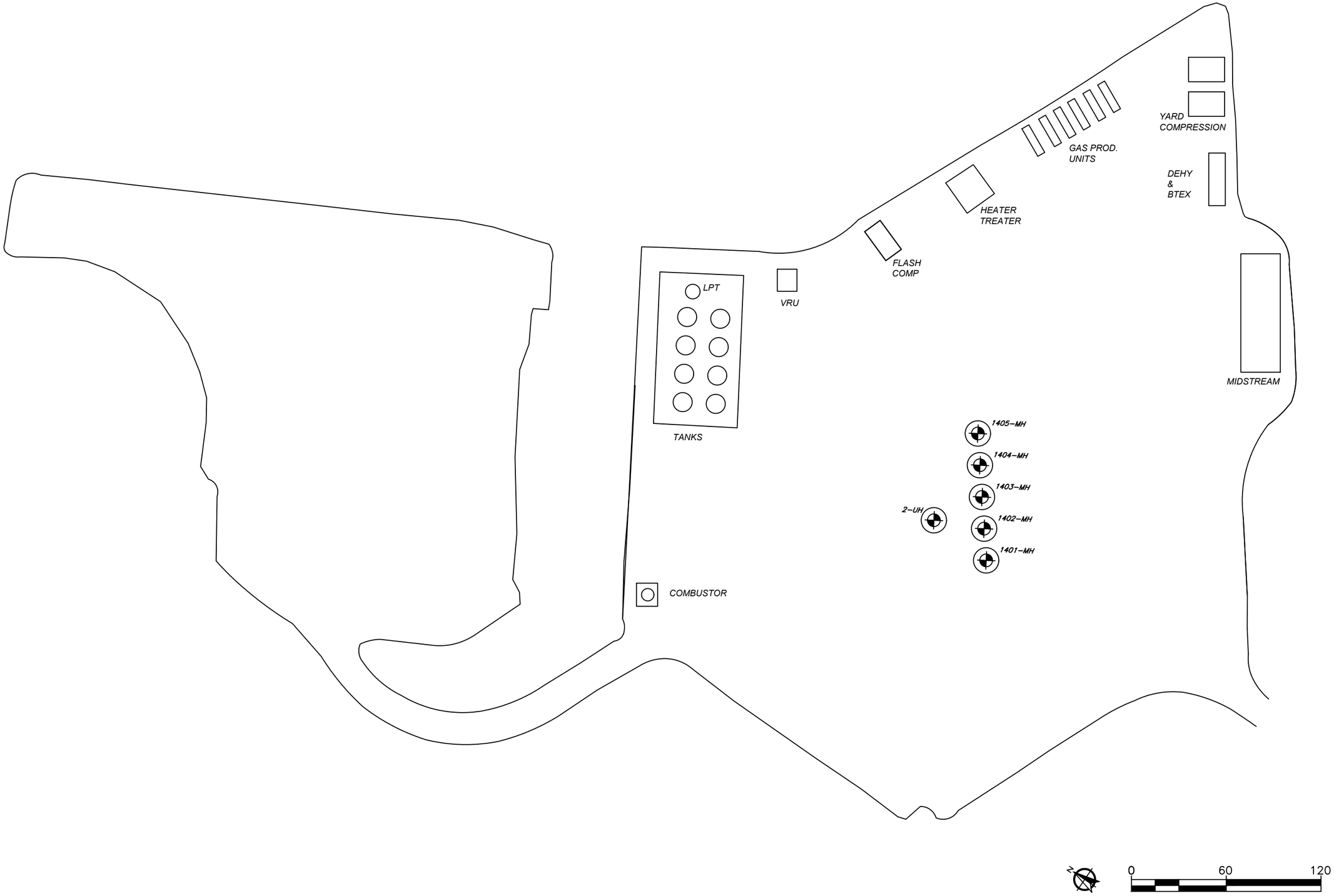
The gas/liquids stream from the heater treaters will be sent to a low pressure separator. Gas from the low pressure separator will be collected by a vapor recovery unit (VRU) powered by a natural gas fired engine (S021). The VRU will send compressed gas to the flash compressor, where it will be routed to the field compressors, dehydration unit, and finally to the sales line. Condensate will be collected in the condensate tanks.

Working, breathing and flash emissions from the condensate and produced water storage tanks will be controlled by the enclosed combustor (C001). Condensate and produced water will be transported off-site via tanker truck (S009) using vapor balanced loading.

A process flow diagram is included as Attachment D.

ATTACHMENT F

Plot Plan



DESIGNED:KJS 10/17
DRAWN:
CHECKED:

APPROVED _____ Date _____
TITLE _____

WELLS MECKLEY

MODEL: PRODUCTION FACILITY

c:\Users\kestiffmanie\Pictures\blueridge-horizontal.png

REVISIONS

DESCRIPTION	DATE	APPROVED	DATE

FILE NO.
WELLS MECKLEY
-PF.DWG

SHEET OF

ABBREVIATIONS	
ADD	ADDITIONAL
ADJ	ADJUSTABLE
AFC/F/G	ABOVE FINISHED CEILING/ FLOOR/GRADE
APPX	APPROXIMATELY
BIT	BITUMINOUS
BL	BUILDING LINE
BM	BEAM/BENCH MARK
BOF/P	BOTTOM OF FOOTER/PIPE
BOT	BOTTOM
BRG	BEARING
CB	CATCH BASIN
CIP	CAST-IN-PLACE
CL	CENTERLINE
CLR	CLEARANCE
CMU	CONCRETE MASONRY UNIT
CJ	CONSTRUCTION/CONTROL JOINT
CO	CLEANOUT
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
DBO	DESIGN BY OTHERS
DCBO	DESIGN & CONSTRUCTION BY OTHERS
DET	DETAIL
DN	DOWN
D&R	DEMOLISH & REMOVE
DWG	DRAWING
EA	EACH
ED	EDGE DISTANCE
EL	ELEVATION
EOP/W	EDGE OF PAVEMENT/WALK
EQ	EQUAL
ES	EACH SIDE
EXIST	EXISTING
EXT	EXTERIOR
FBO	FURNISHED BY OTHERS
FDN	FOUNDATION
FOC/F/M	FACE OF CONCRETE/ FINISH/MASONRY
FS	FAR SIDE
GND	GROUND

ABBREVIATIONS CONT.	
HP	HIGH POINT
I/	INSIDE OF
IBO	INSTALLED BY OTHERS
ID	INSIDE DIAMETER
INCL	INCLUD(E)(ING)
INV	INVERT
ISO	ISOLATION
LP	LOW POINT
MAS	MASONRY
MAT	MATERIAL
MEMB	MEMBRANE
MFR	MANUFACTURER
MH	MANHOLE
NIC	NOT IN CONTRACT
NOM	NOMINAL
NS	NEAR SIDE
NTS	NOT TO SCALE
O/	OUTSIDE OF
OC	ON CENTER
OPP	OPPOSITE
PLC(S)	PLACE(S)
PL(S)	PLATE(S)
PVMT	PAVEMENT
QTY	QUANTITY
REINF	REINFORCING
REQD	REQUIRED
SECT	SECTION
SP	SPACE
SPEC	SPECIFICATION(S)
SQ	SQUARE
STA	STATION
STD	STANDARD
T&B	TOP AND BOTTOM
TBD	TACKBOARD/TO BE DETERMINED
TD	TRENCH DRAIN
TOB/F/M/P/R/S/W	TOP OF BANK/ FOOTER/MASONRY/PIPE /RAIL(ING)/STEEL/ WALL
TOS	TOE OF SLOPE
UNO	UNLESS NOTED OTHERWISE
VIF	VERIFY IN FIELD

UTILITIES

EXISTING/PROPOSED UTILIITES NOT SHOWN IN ENTIRETY. CONSTRUCTION SHALL BE PROPERLY COORDINATED WITH SURVEYOR, TESTING AGENCY, LOCAL UTILITY PROVIDERS, PROPERTY OWNERS, ETC.

REFERENCES

1. BHG SURVEYING TOPOGRAPHIC SURVEY (2014)

SCOPE

THE PROJECT SCOPE OF WORK GENERALLY INCLUDES DEPICTING THE EXISTING CONDITIONS OF THE PREVIOUSLY CONSTRUCTED WELLS-MECKLEY LOCATION. THIS INCLUDES CONSTRUCTING/MAINTAINING SEDIMENT AND EROSION CONTROL.

WORK SHALL BE AS REQUIRED TO FULLY MEET THE INTENT OF THE PROJECT DOCUMENTS IN ACCORDANCE WITH THE PROJECT DOCUMENTS (INCLUDING REFERENCES)

CONTRACTORS SHALL BE RESPONSIBLE FOR ALL LABOR, MATERIALS, TAXES, ETC. ASSOCIATED WITH THE RESPECTIVE WORK AS SPECIFIED IN THE PROJECT DOCUMENTS.

UNDERGROUND UTILITIES
2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE: 800-245-4848
MISS UTILITY
NON-MEMBERS MUST BE CALLED DIRECTLY

SYMBOL LEGEND

- CODED NOTE
- REVISION TRIANGLE
- SECTION
- ELEVATION
- DETAIL
- SPOT ELEVATION
- MANHOLE
- CATCH BASIN
- FIRE HYDRANT
- GUY WIRE
- LIGHT POLE
- UTILITY POLE
- TELEPHONE POLE
- POWER POLE
- GAS/WATER VALVE
- WATER METER
- GAS METER
- UTILITY HANDHOLE
- UTILITY PEDESTAL
- TREE (DECID./EVERGREEN)
- BUSH
- IRON REBAR (SET)
- IRON PIPE (FOUND)
- IRON PIN/REBAR (FOUND)
- STONE (FOUND)
- BOLT (FOUND)
- MAG NAIL (SET)
- ROW MARKER

LINETYPE LEGEND

- EDGE OF GRAVEL
- EDGE OF PAVEMENT
- PROPERTY LINE
- LOT LINE
- RIGHT-OF-WAY
- OH TELEPHONE LINE
- UNDERGROUND TELEPHONE LINE
- OH ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- GAS LINE
- WATER LINE
- COMMUNICATION LINE
- UNDERDRAIN
- WATER EDGE
- DITCH OR SWALE
- BREAKLINE OR SLOPE LINE
- CONSTRUCTION LIMITS (CUT)
- CONSTRUCTION LIMITS (FILL)
- CONSTRUCTION/CONTROL JOINT
- BARBED WIRE FENCE
- CHAIN LINK FENCE
- BOUNDARY
- CENTERLINE
- MATCHLINE

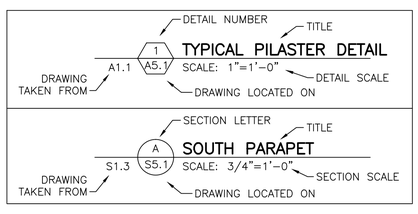
MATERIAL LEGEND

- CONCRETE
- WELL-GRADED STONE/GRAVEL
- UNIFORM-GRADED STONE/GRAVEL
- SOIL
- BEDROCK
- GRASS
- WATER
- SAND

AUTHORITY CONTACTS

WVDEP (304-926-0495)
WVDEP OFFICE OF OIL & GAS (304-926-0499)
WVDNR (304-558-3225)
ARMY CORPS OF ENGINEERS (304-399-5353)
WVDEP OFFICE OF OIL & GAS TYLER COUNTY INSPECTOR (304-380-7469)

SECTION AND DETAIL NOTATION



TRIAD HUNTER, LLC

WELLS MECKLEY LOCATION AS-BUILT

TYLER COUNTY, WEST VIRGINIA

INDEX OF DRAWINGS		
DRAWING NUMBER	DRAWING DESCRIPTION	REVISION
T0.1	TITLE SHEET	1
C1.1	AS-BUILT/SEDIMENT & EROSION CONTROL PLAN (1 OF 2)	2
C1.2	AS-BUILT/SEDIMENT & EROSION CONTROL PLAN (2 OF 2)	0
C2.1	ACCESS ROAD PROFILES	1

A. GOVERNING SPECIFICATIONS

1. THE GOVERNING SPECIFICATIONS FOR THE PROJECT ARE THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP) OFFICE OF OIL AND GAS (OOG) TITLE 35 SERIES 4, WVDEP EROSION AND SEDIMENT CONTROL MANUAL OF THE OOG, THE WVDEP CONSTRUCTION STORMWATER MANUAL, AND THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, STANDARD SPECIFICATIONS ROADS AND BRIDGES, ADOPTED JANUARY 1, 2010, AS AMENDED BY THE WEST VIRGINIA DIVISION OF HIGHWAYS SUPPLEMENTAL SPECIFICATIONS, ISSUED JANUARY 1, 2012 (FROM HERE ON REFERRED TO AS WVDOH).
2. ALL WORK SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF THE GOVERNING AUTHORITIES HAVING JURISDICTION INCLUDING ALL APPLICABLE CODES, SPECIFICATIONS, STANDARDS, AND GUIDELINES ADOPTED BY SUCH AUTHORITIES.
3. DISCREPANCIES BETWEEN THE PLANS AND VARIOUS CODES, STANDARDS, SPECIFICATIONS, ETC. SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR REMEDIATION.
4. THE PROJECT DRAWINGS SHALL SUPPLEMENT AND AMEND THE GOVERNING SPECIFICATIONS/OTHER REFERENCED SPECIFICATIONS AND SHALL RULE IN CASE OF CONFLICT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO EITHER ACQUIRE REFERENCE SPECIFICATIONS OR CONTACT THE ENGINEER CONCERNING HOW TO ACQUIRE SUCH SPECIFICATIONS.

B. PERMITS

1. ALL FEDERAL, STATE, AND LOCAL PERMITS ASSOCIATED WITH THE PROJECT SHALL BE OBTAINED BY THE CLIENT.
2. PROPER PERMIT DOCUMENTATION SHALL BE KEPT ON SITE AT ALL TIMES AND ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE RESPECTIVE PERMITS. ALL PERMIT CONDITIONS SHALL BE PROPERLY COMPLETED (E.G. INSPECTION SCHEDULING).
3. ALL PERMITS SHALL BE OBTAINED PRIOR TO COMMENCEMENT OF WORK.

C. INSPECTIONS, SAMPLING, AND TESTING

1. ALL INSPECTIONS, SAMPLING, AND TESTING OF WORK ITEMS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: EXCAVATION, EMBANKMENT, SOIL COMPACTION, SUBGRADE PREPARATION, BACKFILL, AGGREGATE BASE, CONCRETE, AND ASPHALT SHALL BE (OR: AS DIRECTED BY THE OWNER AND) IN ACCORDANCE WITH THE WVDOH STANDARD SPECIFICATIONS, PROJECT SOILS REPORT, MANUFACTURER SPECIFICATIONS, ACI 301/318, THE PROJECT DOCUMENTS, AND AUTHORITIES HAVING JURISDICTION REQUIREMENTS. INSPECTION, SAMPLING, AND TESTING SHALL BE PERFORMED BY AN INDEPENDENT, CERTIFIED TESTING AGENCY APPROVED BY THE OWNER AND EMPLOYED BY THE CONTRACTOR. ALL RESULTS SHALL BE PROMPTLY REPORTED TO THE ENGINEER. THE OWNER, AT THEIR EXPENSE, MAY ALSO RETAIN A QUALIFIED PROFESSIONAL TO PERFORM INDEPENDENT QUALITY CONTROL/ASSURANCE CHECKS ON THE CONTRACTOR'S WORK. WHERE QC/QA REQUIREMENT CONFLICTS EXIST, PROJECT MANUAL REQUIREMENTS SHALL RULE. WHERE DOH SPECIFICATIONS APPLY, THE CONTRACTOR SHALL PERFORM DUTIES ASCRIBED TO THE "CONTRACTOR" WITH THE OWNER RESERVING THE OPTION TO PERFORM DUTIES SIMILAR OR DIFFERENT TO THOSE ASCRIBED TO THE "DIVISION".

D. BENCH MARKS

1. BENCH MARK LOCATIONS SHALL BE HELD/PROTECTED THROUGHOUT THE LIFE OF THE PROJECT. IN THE EVENT A BENCH MARK IS DISTURBED, THE BENCH MARK SHALL BE RELOCATED OR REESTABLISHED AS DIRECTED BY THE ENGINEER.

E. VERIFICATIONS

1. ALL DIMENSIONS AND SITE CONDITIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION. IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

F. UTILITIES

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF EXISTING UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. ALL EXISTING UTILITIES WITHIN THE WORK AREA SHALL BE FIELD VERIFIED. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO EXISTING UTILITIES INCLUDING, BUT NOT LIMITED TO, PROVIDING PROTECTIVE MEASURES DURING CONSTRUCTION.

G. CLEARING AND GRUBBING

1. THE AREA WITHIN THE CONSTRUCTION LIMITS SHALL BE CLEARED OF ALL TREES, BRUSH, LOGS, FENCES, RUBISH, ETC. ALL TREES SHALL BE CLEARED AND GRUBBED WITHIN 15 FEET OF THE TOE OF ANY EMBANKMENT.

H. DRAINAGE

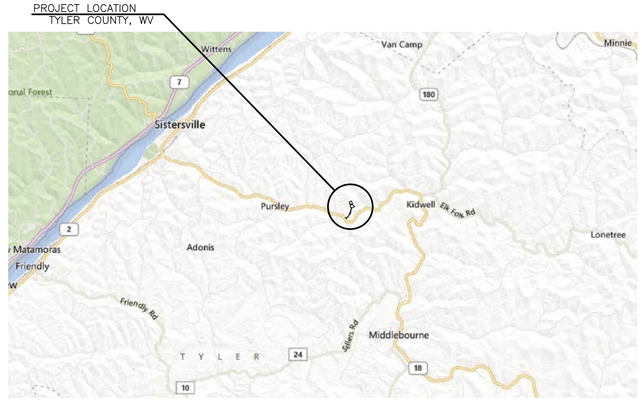
1. WORKING STORM DRAINAGE SYSTEMS THROUGHOUT THE WORK AREAS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. THE WORKING SYSTEM MAY CONSIST OF THE EXISTING STORM DRAINAGE SYSTEM, THE PROPOSED STORM DRAINAGE SYSTEM, OR A COMBINATION THEREOF. THE SITE SHALL BE GRADED TO DRAIN AND BE MAINTAINED FREE OF PONDING AT ALL TIMES. TEMPORARY DRAINS, SUMPS, PORTABLE PUMPING EQUIPMENT, ETC. SHALL BE UTILIZED AS REQUIRED. MEASURES SHALL BE TAKEN TO MINIMIZE EROSION AND NOT ALTER EXISTING DRAINAGE CONDITIONS WITH RESPECT TO NEIGHBORING AND DOWNSTREAM PROPERTIES.
2. ALL PIPES TO REMAIN SHALL BE CONNECTED TO THE DRAINAGE SYSTEM OR HAVE POSITIVE OUTLET. ALL DRAINAGE OUTLET STRUCTURES SHALL BE FIELD ADJUSTED AS REQUIRED TO MATCH THE EXISTING GROUND AS DIRECTED BY THE ENGINEER. ALL EXISTING DRAINAGE FACILITIES SHALL BE FIELD VERIFIED.

I. EROSION AND SEDIMENT CONTROL AND STORM WATER POLLUTION PREVENTION PLAN

1. ALL SITE WORK, EROSION AND SEDIMENT CONTROL, ETC SHALL BE IN ACCORDANCE WITH THE WVDEP EROSION AND SEDIMENT CONTROL FIELD MANUAL OF THE OFFICE OF OIL AND GAS (MAY 2012) IN ADDITION TO THE WVDEP CONSTRUCTION STORMWATER MANUAL. SPECIFIC DESIGNS ARE BEYOND THE SCOPE OF THESE DRAWINGS.
2. ALL TEMPORARY AND PERMANENT SEDIMENT AND EROSION CONTROL AND STORM WATER POLLUTION PREVENTION ACTIVITIES SHALL BE PROVIDED AS REQUIRED. ALL STATE AND FEDERAL REGULATIONS, INCLUDING THE WVDOH EROSION AND SEDIMENT CONTROL FIELD MANUAL AND WVDOH 642/652, SHALL BE OBSERVED. THE LOCATION AND TIMING OF ALL EROSION AND SEDIMENT CONTROL ITEMS SHALL BE FIELD ADJUSTED TO PREVENT SIGNIFICANT IMPACTS ON RECEIVING WATERS. IMPLEMENTATION OF THIS STORM WATER POLLUTION PREVENTION PLAN SHALL CONTINUE THROUGHOUT THE DURATION OF THE PROJECT OR UNTIL SUCH TIME THAT THE UPSLOPE DISTURBED AREAS ARE STABILIZED. ALL REASONABLE ATTEMPTS SHOULD BE MADE TO MINIMIZE THE TOTAL AREA OF DISTURBED LAND. ALL AREAS THAT ARE TO REMAIN DORMANT FOR MORE THAN 21 DAYS, BUT LESS THAN 1 YEAR, SHALL BE STABILIZED WITH ITEM 642004-001, SEED MIXTURE, TEMPORARY WITHIN 7 DAYS OF THE MOST RECENT DISTURBANCE. AREAS THAT ARE TO REMAIN DORMANT FOR MORE THAN 1 YEAR SHALL BE STABILIZED WITH PERMANENT SEEDING AND MULCHING WITHIN 7 DAYS OF THE MOST RECENT DISTURBANCE. MEASURES SHALL BE MAINTAINED/REPLACED AS REQUIRED.
3. SEDIMENT CONTROL DEVICES SHALL BE IMPLEMENTED PRIOR TO GRUBBING FOR ALL AREAS REMAINING DISTURBED FOR OVER 14 DAYS.
4. STABILIZED OUTLETS AND WEIRS SHALL CONSIST OF GEOTEXTILE FABRIC AND RIPRAP. RIPRAP SHOULD CONSIST OF WELL-GRADED STONE 2 INCHES TO 8 INCHES IN DIAMETER.
5. THE AREA UNDER THE EMBANKMENT SHOULD BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MAT.
6. CONSTRUCTION OPERATIONS SHOULD BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
7. SEDIMENT TRAPS SHOULD NOT BE REMOVED UNTIL THE CONTRIBUTING DISTURBED AREA HAS BEEN STABILIZED.
8. MATERIAL REMOVED FROM THE EXCAVATED SECTION OF THE SEDIMENT TRAP SHOULD BE PLACED IN AN AREA AND STORED IN A MANNER THAT WILL NOT CREATE AN EROSION PROBLEM.
9. SEDIMENT FROM TRAPS AND BASINS SHOULD BE REMOVED BEFORE THE TRAP'S WET STORAGE VOLUME IS REDUCED BY ONE-HALF.
10. FILTER STONE SHOULD BE REGULARLY CHECKED TO ENSURE THAT FILTRATION PERFORMANCE IS MAINTAINED. STONE CHOKED WITH SEDIMENT SHOULD BE REMOVED AND CLEANED OR REPLACED.
11. SEDIMENT TRAPS AND BASINS SHALL BE INSPECTED AT A MINIMUM ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF RAIN PER 24 HOUR PERIOD.

J. WORK STOPPAGE

1. SEDIMENT AND EROSION CONTROL FEATURES SHALL BE OPERATED AND MAINTAINED IN AN ACCEPTABLE CONDITION.
2. WHEN ANY EROSION OR SEDIMENT CONTROL FEATURE HAS REACHED HALF ITS CAPACITY, THE DEVICE SHALL BE CLEANED OUT AND RESTORED TO ITS ORIGINAL CONDITION.
3. A SPILL PREVENTION, CONTROL, AND COUNTERMEASURES (SPCC) PLAN THAT ITEMIZES SPECIFIC MEASURES THAT WILL BE IMPLEMENTED TO PREVENT AND CLEAN UP CHEMICAL AND PETROLEUM PRODUCT SPILLS THAT MAY OCCUR DURING ALL PHASES OF PROJECT CONSTRUCTION SHALL BE PREPARED. FUEL STORAGE AND REFUELING ACTIVITIES, EQUIPMENT MAINTENANCE ACTIVITIES, AND EQUIPMENT WASHING SHALL BE KEPT AT LEAST 500 FEET AWAY FROM ANY PERENNIAL OR INTERMITTENT WATERCOURSE OR WETLAND.



PROJECT LOCATION MAP
SCALE: N.T.S.

K. SEEDING, FERTILIZING, AND MULCHING

1. UNLESS NOTED OTHERWISE, ALL DISTURBED SOIL AREAS ARE TO BE SEEDED, FERTILIZED, AND MULCHED. SEEDING, FERTILIZING, AND MULCHING WILL BE AS SPECIFIED IN WVDOH 652. AREAS 3:1 OR FLATTER SHALL RECEIVE A TYPE C-2 MIXTURE (OWNER-APPROVED LAWN MIX). AREAS STEEPER THAN 3:1 SHALL RECEIVE A TYPE L MIXTURE. DISTURBED AREAS OVER 50 FEET AWAY FROM A STREAM SHALL BE SEEDED AND MULCHED WITHIN 7 DAYS OF REACHING FINAL GRADE. OTHER SUCH AREAS SHALL BE SEEDED AND MULCHED WITHIN 2 DAYS OF REACHING FINAL GRADE. GRADE. TESTING WILL NOT BE REQUIRED ON THESE ITEMS PURCHASED FROM A REPUTABLE DEALER. ALL DAMAGES TO PREVIOUSLY SEEDED AREAS SHALL BE REPAIRED.

L. TREE REMOVAL

1. ALL TREES NOTED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE PROPERLY DISPOSED OFF-SITE. TREES SHALL BE SUBSTANTIALLY REMOVED IN THEIR ENTIRETY IN ACCORDANCE WITH ITEM 201001-000 AND STRUCTURALLY BACKFILLED WITH SUITABLE MATERIAL.
2. STUMPS SHALL BE EITHER GROUND AND CHIPPED OR REMOVED FROM THE SITE.

M. EARTHWORK

1. ALL TOPSOIL SHALL BE REMOVED FROM THE AREA WITHIN THE CONSTRUCTION LIMITS.
2. SOIL DESIGNATED AS UNSUITABLE (E.G. TOPSOIL) SHALL BY NO MEANS BE USED AS FILL MATERIAL. ALL EARTHWORK SHALL BE IN DIRECT ACCORDANCE WITH OSHA REQUIREMENTS. TEMPORARY SHORING, TRENCH BOXES, SUMP PUMPS, BORING/JACKING, UNDERPINNING, TIEBACKS, ETC. SHALL BE DESIGNED AND USED DURING CONSTRUCTION AS REQUIRED.
3. FILL MATERIAL SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6 INCHES, FROZEN OR OBJECTIONABLE MATERIALS. MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.
4. AREAS ON WHICH THE FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. ANY SOFT SPOTS SHALL BE ADEQUATELY REMOVED AND REPLACED WITH PROPERLY COMPACTED FILL. FILL MATERIAL SHALL BE PLACED IN CONTINUOUS LIFTS (THICKNESS SPECIFIED BELOW) OVER THE ENTIRE LENGTH OF FILL (+/-2% MOISTURE CONTENT & 95% COMPACTION).
5. EXCESS EXCAVATED MATERIAL SHALL BE PLACED IN DESIGNATED WASTE MATERIAL AREAS AND OFF ALL NEW EMBANKMENTS.
6. ALL ORIGINAL GROUND SLOPES SHALL BE BENCHED TO ENSURE PROPER PLACEMENT OF FILL MATERIAL.
7. LIFT THICKNESSES SHALL BE PLACED ACCORDING TO WVDOH 207.THE CONTRACTOR SHALL RECORD MATERIAL TYPE AND THE LIFT THICKNESS FOR ALL TYPES OF EMBANKMENT. IN PLACES INACCESSIBLE TO A ROLLER, SUCH AS ADJACENT TO CULVERTS, RETAINING WALLS AND OTHER STRUCTURES, THE FILL MATERIAL SHALL BE PLACED IN 4 IN. (150 MM) COMPACTED LAYERS, UNIFORMLY COMPACTED WITH APPROVED TAMPERS.
   - 7.1. RANDOM MATERIAL (SOIL, GRANULAR MATERIAL AND SOFT SHALE): RANDOM MATERIAL AS DEFINED IN WVDOH 716 SHALL BE PLACED IN EMBANKMENTS IN SUCCESSIVE LAYERS NOT TO EXCEED 6 INCHES (150 MM) IN THICKNESS AFTER COMPACTION.
   - 7.2. HARD SHALE: THIS MATERIAL IS DEFINED IN THE APPLICABLE PROVISIONS OF WVDOH 716. WHEN SUITABLE RANDOM MATERIAL IS TO BE MIXED WITH HARD SHALE, THIS MIXTURE SHALL BE PLACED IN THE EMBANKMENT IN LIFT THICKNESSES PRESCRIBED. MIXTURES WHICH CONTAIN 66 PERCENT OR MORE OF SUITABLE RANDOM MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 6 INCHES (150 MM) IN THICKNESS AFTER COMPACTION. MIXTURES WHICH CONTAIN 35 TO 65 PERCENT (BY VISUAL INSPECTION) OF SUITABLE RANDOM MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12 IN. (300 MM) BEFORE COMPACTION. MIXTURES WHICH CONTAIN FROM ZERO TO 35 PERCENT (BY VISUAL INSPECTION OF SUITABLE RANDOM MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 24 IN. (600 MM). THE LIFT THICKNESS SHALL BE AS THIN AS THE EXCAVATED MATERIAL WILL PERMIT.
   - 7.3. ROCK: THIS MATERIAL, AS DEFINED IN WVDOH 716, SHALL BE PLACED IN THE EMBANKMENT IN LAYERS OF THICKNESS AS PRESCRIBED. MIXTURES WHICH CONTAIN 66 PERCENT OR MORE (BY VISUAL INSPECTION) OF SUITABLE RANDOM MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 6 INCHES (150 MM) AFTER COMPACTION. MIXTURES WHICH CONTAIN 35 TO 65 PERCENT (BY VISUAL INSPECTION) OF SUITABLE RANDOM MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12 IN (300 MM) BEFORE COMPACTION. MIXTURES WHICH CONTAIN ZERO TO 35 PERCENT (BY VISUAL INSPECTION) OF SUITABLE RANDOM MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 36 IN (900 MM). THE LIFT THICKNESS SHALL BE AS THIN AS THE EXCAVATED MATERIAL WILL PERMIT. ROCK LIFTS THAT ARE DESIGNATED AS SELECT EMBANKMENT SHALL CONTAIN NO MORE THAN 15 PERCENT OF OTHER SUITABLE EMBANKMENT MATERIAL (BY VISUAL INSPECTION). THE DOMINANT ROCK SIZE SHALL BE 6 INCHES, (150 MM) AND GREATER. DURING EXCAVATION AND HANDLING, THE CONTRACTOR SHALL AVOID CONTAMINATING THE SELECT EMBANKMENT WITH OTHER EMBANKMENT MATERIALS. ROCK FOR SELECT EMBANKMENT SHALL BE RESERVED FROM THE EXCAVATION UP TO THE PLAN QUANTITY REQUIRED. IF SELECT EMBANKMENT FROM THE EXCAVATION IS WASTED PRIOR TO MEETING THE PLAN QUANTITIES, THE CONTRACTOR SHALL BE RESPONSIBLE, AND BEAR THE EXPENSE, FOR REPLACING THE MATERIAL WASTED UP TO THE PLAN QUANTITY. ROCK LIFTS IN EMBANKMENT SHALL BE PLACED IN APPROXIMATELY LEVEL LAYERS OF UNIFORM THICKNESS. THE SIZE OF THE ROCK LIFTS SHALL NOT EXCEED 36 INCHES (900 MM). THE ROCK SHALL NOT BE GREATER IN ANY DIMENSION THAN 36 INCHES (900 MM). WHEN ROCK IS USED AS A LINING FOR DRAINAGE CHANNELS, IT SHALL BE PLACED TO THE THICKNESS CALLED FOR ON THE PLANS OR CROSS SECTIONS. THE DIMENSIONS OF THE ROCK MAY BE AS LARGE AS THE THICKNESS OF THE BLANKET WILL PERMIT.
8. THE CERTIFIED TESTING AGENCY SHALL VERIFY ALL SUBGRADES HAVE BEEN COMPACTED TO AT LEAST 95% OF THE MATERIAL'S MAXIMUM DRY DENSITY (OBTAINED IN ACCORDANCE WITH ASTM STANDARD METHOD D-698), ARE NOT FROZEN, AND ARE NEAR OPTIMUM MOISTURE CONTENT (+/-2%). IF REQUIRED, THE AGENCY'S GEOTECHNICAL ENGINEER SHALL ALSO RECOMMEND THE LIMITS OF ADDITIONAL EXCAVATION. ALL SUBGRADES SHALL BE INSPECTED BY THE TESTING AGENCY'S REPRESENTATIVE PRIOR TO PLACEMENT OF EMBANKMENT, AGGREGATE, ETC. IF UNSUITABLE MATERIAL IS FOUND AT THE DRAWING SUBGRADE DEPTHS, ADDITIONAL EXCAVATION SHALL BE REQUIRED UNTIL SUITABLE BASES ARE ENCOUNTERED. ADDITIONAL EXCAVATIONS ARE TO BE BACKFILLED WITH PROPERLY COMPACTED ENGINEERED (CONTROLLED) FILL OR AGGREGATE BASE MATERIAL. THE AGGREGATE BASE SHALL BE ITEM 307001-000 AND BE PLACED ON A SUBGRADE PROPERLY PREPARED IN ACCORDANCE WITH WVDOH 307. ALTERNATE METHODS MUST BE APPROVED BY THE ENGINEER.
9. TO THE BEST OF THE ENGINEER'S KNOWLEDGE, A SUBSURFACE INVESTIGATION HAS NOT BEEN CONDUCTED AND A SOILS REPORT HAS NOT BEEN PREPARED FOR THE SITE. A SUBSURFACE INVESTIGATION SHOULD BE CONDUCTED PRIOR TO CONSTRUCTION. IF NO SUBSURFACE INVESTIGATION WILL BE CONDUCTED, PICKERING ASSOCIATES SHALL ASSUME SOIL PROPERTIES/CHARACTERISTICS FROM THE USDA NRCS, THE 2003 EDITION OF THE INTERNATIONAL BUILDING CODE, AND CLIENT PROVIDED INFORMATION OBTAINED FROM TEST PITS/VISUAL INSPECTION (IF APPLICABLE).
10. SHEEPS FOOT OR TRACKED EQUIPMENT SHALL BE USED FOR COHESIVE MATERIAL COMPACTION AND A VIBRATORY DRUM FOR GRANUAL COMPACTION. REGARDLESS, A POSITIVE DRAINING SURFACE SHALL BE PREPARED OVER ALL EXPOSED EARTH FOR SMOOTH ROLLED, SEMI-IMPERVIOUS WEATHER PROTECTION DURING OFF-WORK TIMES.

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Rev.	Description	By	Date
0	ISSUED FOR PERMIT	MAW	03/30/15
1	ISSUED FOR PERMIT	MAW	11/20/14

Drawing Description
TRIAD HUNTER, LLC
TYLER COUNTY, WEST VIRGINIA
WELLS MECKLEY LOCATION AS-BUILT
TITLE SHEET

MARK A. WELCH
REGISTERED
18685
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

Project: 2129036.2
Designed By: JRB
Drawn By: JRB
Checked By: MAW
Scale: AS NOTED
Plot Date: 03/30/15
Revision: 1
Drawing Number:
T0.1

N: 380915. 64'
E: 1566978. 63'
Z: 1005. 97'

EXISTING EDGE OF AGGREGATE (TYP.)

EXCAVATED ROCK PILE IN THIS AREA

EXISTING ROCK PILE

EXISTING EDGE OF AGGREGATE

EXISTING GRASS/ STABILIZED SLOPE

EXISTING FILTER SOCK (TYP.)

EXISTING FILTER SOCK (TYP.)

EXISTING SUPER SILT FENCE (TYP.)

GRAVEL PAD

EXISTING CONCRETE PRODUCTION PAD

CONCRETE PAD

EXIST. AGGREGATE PAD

PRODUCTION PAD ACCESS RD

OPEN PIPE
INV. : 980. 07
12" STEEL

EX. RIPRAP-LINED DITCH (TYP.)

EXISTING AGGREGATE ROADWAY

EXISTING SEGMENTAL RETAINING WALL

EXISTING SEGMENTAL RETAINING WALL

EXISTING SEGMENTAL RETAINING WALL

OPEN PIPE
INV. IN: 953. 39
INV. OUT: 951. 88
12" HDPE

EXISTING EDGE OF AGGREGATE (TYP.)

CONDENSATE TANKS

H2O TANKS

H2O TANKS

PROPOSED TANKS
LAT: 39.535717527
LON: -80.923045307

PROPOSED COMBUSTORS
LAT: 39.535574091
LON: -80.922297477

EXISTING SUPER SILT FENCE (TYP.)

EXTENTS OF PAD BERM (TYP.)

WELLHEAD 1405
API# 047-095-02155
(EXISTING)

EXIST. AGGREGATE PAD

WELLHEAD 1404
API# 047-095-02154
(EXISTING)

WELLHEAD 1402
API# 047-095-02152
(EXISTING)

PROPOSED WELL
LAT: 39.53528342
LON: -80.92265132

WELLHEAD 1403
API# 047-095-02153
(EXISTING)

WELLHEAD 1401
API# 047-095-02151
(EXISTING)

GRAVEL PAD

EQUIPMENT IN THIS AREA

EXTENTS OF PAD BERM (TYP.)

EXISTING SUMP PIPE

PIPE WITH VALVE
INV. IN: 951. 90
INV. OUT: 950. 80
8" PVC

EXISTING SUMP PIPE

PIPE WITH VALVE
INV. IN: 949. 91
INV. OUT: 949. 43
8" PVC

EXIST. EDGE AGG.

EXISTING GRASS/ STABILIZED SLOPE

EXISTING SUPER SILT FENCE (TYP.)

EXISTING SEGMENTAL RETAINING WALL

MOUNTABLE BERM
(SEE SEC.A/C1.1)

OPEN PIPE
INV. : 950. 20
6" STEEL

EXISTING SUPER SILT FENCE

LIMIT OF DISTURBANCE (TYP.)

RIPRAP-LINED ROADWAY DITCH (TYP.)

OPEN PIPE
INV. IN: 924. 94
INV. OUT: 923. 42
12" HDPE

EXISTING AGGREGATE ROADWAY

OPEN PIPE
INV. IN: 926. 95
INV. OUT: 925. 51
12" HDPE

DWG. C1.1
DWG. C1.2

OPEN PIPE
INV. IN: 894. 93
INV. OUT: 893. 53
12" HDPE

EXISTING ROADWAY BERM

NOTES:

1. THE INTENT OF THESE DRAWINGS IS TO DEPICT THE EXISTING CONDITIONS OF THE PREVIOUSLY PERMITTED WELLS-MECKLEY 1401, 1402, 1403, 1404, & 1405 DRILL SITE. THE SITE HAS BEEN STABILIZED (GRASS GROWING AND ESTABLISHED) SINCE THE ORIGINAL CONSTRUCTION WAS COMPLETED. NO FUTURE DISTURBANCE OF THE SITE IS PLANNED FOR THE DRILLING OF A PROPOSED UTICA WELL. ONLY MAINTENANCE OF EXISTING SEDIMENT AND EROSION CONTROLS WILL BE REQUIRED.
2. DRAWING T0.1 SHALL BE REFERENCED FOR ADDITIONAL NOTES.
3. AREA SUMMARY:
   - 3.1. TOTAL SITE AREA = 17.25 ACRES
     - 3.1.1. DRILL PAD SITE AREA = 5.43 ACRES
     - 3.1.2. PRODUCTION PAD SITE AREA = 3.48 ACRES
     - 3.1.3. MAIN ACCESS ROAD AREA = 6.02 ACRES
     - 3.1.4. PRODUCTION PAD ACCESS ROAD = 0.54 ACRES
   - 3.2. DISTURBED AREA = 16.91 ACRES
4. ALL SITE/OFF SITE STORM WATER SHALL BE DIRECTED AWAY FROM THE DRILL PAD VIA SWALES (NOT ALL SHOWN).
5. ALL DISTURBED AREAS SHALL BE PROPERLY SEEDED AND MULCHED TO ENSURE VEGETATIVE STABILIZATION.
6. ALL SITE WORK, EROSION AND SEDIMENT CONTROL, ETC. SHALL BE IN ACCORDANCE WITH THE WVDEP EROSION AND SEDIMENT CONTROL MANUAL OF THE OFFICE OF OIL AND GAS IN ADDITION TO THE WVDEP CONSTRUCTION STORMWATER MANUAL.
7. ALL SPOT ELEVATIONS REPRESENT FINISHED SURFACES. PIPE ELEVATIONS SHOWN IN ITALICS REPRESENT PIPE INVERTS.
8. ALL CONTOURS REPRESENT FINISHED SURFACES (E.G. CONTOURS AT PAD AND DRIVE LOCATIONS REPRESENT TOP OF STONE, CONTOURS OUTSIDE OF STONED AREAS REPRESENT TOP OF GROUND, ETC.).
9. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE IN DIRECT ACCORDANCE WITH THE WVDOH STANDARD SPECIFICATIONS, THE WVDOH SEDIMENT AND EROSION CONTROL MANUAL, THE PROJECT DOCUMENTS, AND AUTHORITIES HAVING JURISDICTION REQUIREMENTS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING POSITIVE DRAINAGE (NO STANDING WATER) IS ATTAINED THROUGHOUT AND UPON COMPLETION OF THE PROJECT.
11. DRAWINGS T0.1 AND C1.1 SHALL BE REFERENCED FOR ADDITIONAL NOTES.

RECLAMATION NOTES:

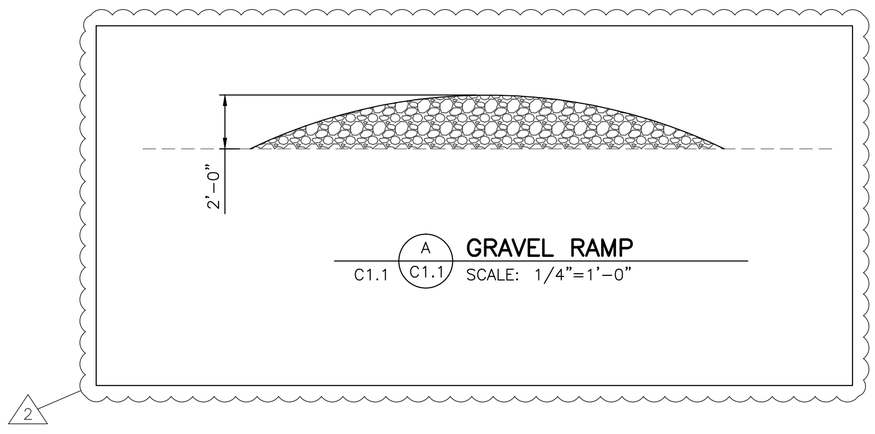
1. RECLAMATION EFFORTS SHALL REFER TO AND COORDINATE WITH DRAWINGS ASSOCIATED IN THE ORIGINAL SITE CONSTRUCTION SET FOR THE WELLS-MECKLEY LOCATION ISSUED FOR BID DATED 05/27/14 (DWG. C1.6: RECLAMATION PLAN). THE INTENT OF C1.6 OF THE ORIGINAL CONSTRUCTION DOCUMENTS DATED 05/27/14 IS TO SHOW AREAS WHICH WILL BE RE-GRADED/RECLAIMED ONCE THE SITE OPERATIONS ARE CONSIDERED COMPLETE. THE DRILL PAD AGGREGATE AREA WILL REMAIN THE SAME. AN OPENING IN THE CONTAINMENT BERM WILL BE PROVIDED AND THE SUMP AREA RE-GRADED TO ENSURE ADEQUATE DRAINAGE OF THE SITE. SUMP LINE AND OUTLET PIPE WILL BE REMOVED.
2. ALL AREAS OUTSIDE OF RECLAMATION DISTURBANCE LIMITS AS SHOWN IN THE ORIGINAL SITE CONSTRUCTION DOCUMENTS FOR THE WELLS-MECKLEY LOCATION SHALL NOT BE DISTURBED OR RECLAIMED.
3. RECLAMATION WORK SHALL BE PERFORMED ONLY AFTER THE CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED FROM INITIAL CONSTRUCTION.
4. ALL RECLAMATION WORK SHALL BE DONE IN ACCORDANCE WITH WVDEP, OFFICE OF OIL & GAS EROSION AND SEDIMENT CONTROL FIELD MANUAL.
5. SEQUENCE OF WORK:
   - 5.1. VERIFY EXISTING SUPER SILT FENCE IS FUNCTIONING PROPERTY. MODIFY/REPAIR AS REQUIRED.
   - 5.2. REMOVE SUMP OUTLET PIPE AND SUMP LINER. DISPOSE OF PROPERTY.
   - 5.3. RE-GRADE RECLAMATION AREA AS SHOWN. EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH NOTE "M: EARTHWORK" ON DRAWING C0.1.
   - 5.4. PLACE 6" TOPSOIL ON ALL DISTURBED AREAS.
   - 5.5. SEED AND MULCH DISTURBED AREAS.
   - 5.6. AFTER SITE IS STABILIZED, REMOVE SILT FENCE.
6. DRAWINGS T0.1 AND C1.1 SHALL BE REFERENCED FOR ADDITIONAL NOTES.

CODED NOTES:

1.

NOTE:

THE WELLS THAT ARE EXISTING HAVE PREVIOUSLY BEEN DRILLED.



A C1.1 GRAVEL RAMP
SCALE: 1/4"=1'-0"

AS-BUILT/SEDIMENT & EROSION CONTROL PLAN
SCALE: 1"=40'

Drawing Number:	C1.1
Revision:	2
Plot Date:	03/23/15
Scale:	AS SHOWN
Checked By:	MAW
Drawn By:	JRB
Designed By:	JRB
Project:	2129036.2

MARK A. WELCH REGISTERED PROFESSIONAL ENGINEER 18685 STATE OF WEST VIRGINIA

Drawing Description

TRIAD HUNTER, LLC.
TYLER COUNTY, WV
WELLS-MECKLEY LOCATION AS-BUILT
AS-BUILT/SEDIMENT & EROSION CONTROL PLAN (1 OF 2)

Rev.	Description	By	Date
2	ISSUED FOR PERMIT	MAW	03/23/15
1	ISSUED FOR PERMIT	MAW	01/28/15
0	ISSUED FOR PERMIT	MAW	11/20/14

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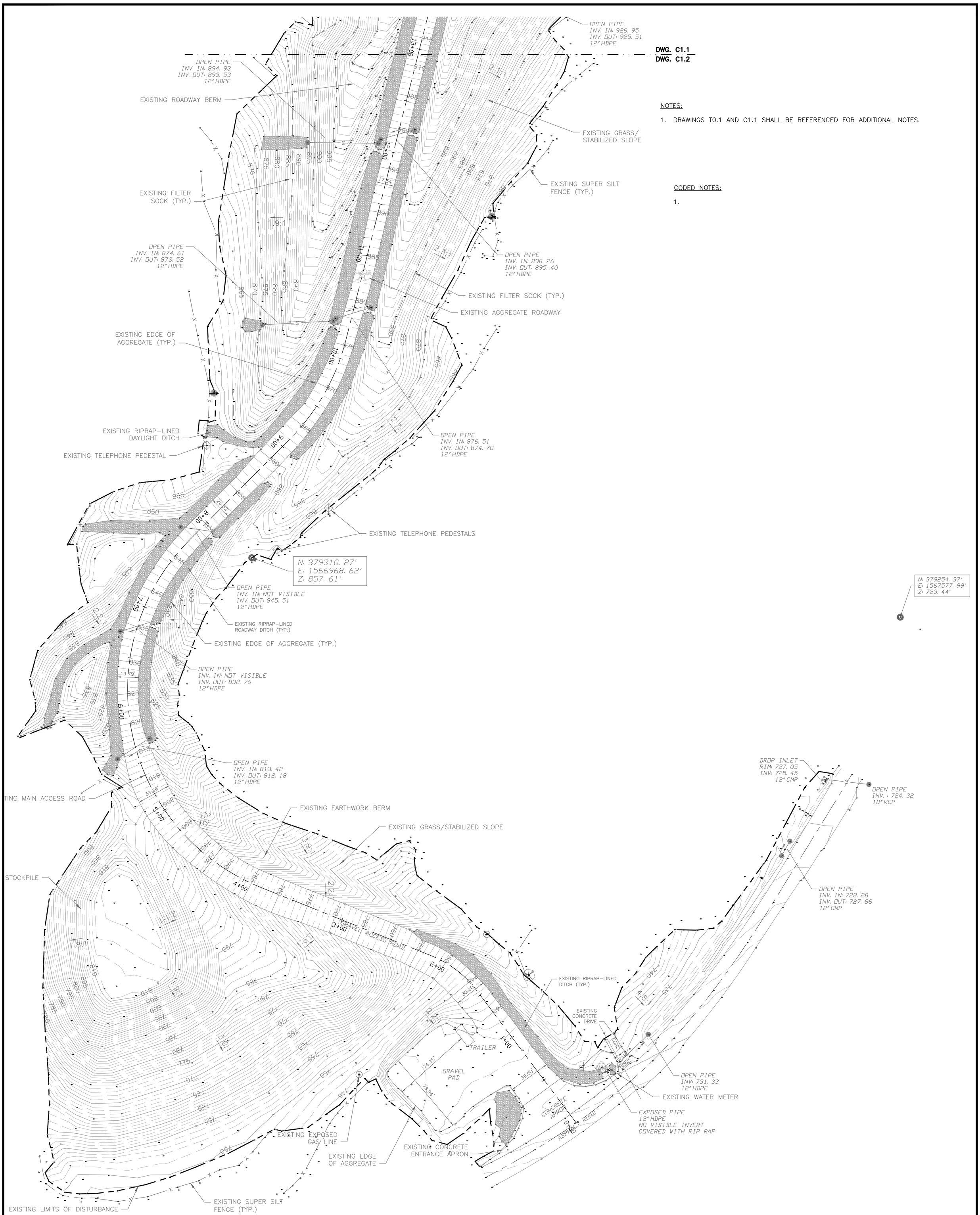

NOTES:

1. DRAWINGS T0.1 AND C1.1 SHALL BE REFERENCED FOR ADDITIONAL NOTES.

CODED NOTES:

1.

AS-BUILT/SEDIMENT &
EROSION CONTROL PLAN
SCALE: 1"=40'

Drawing Number:	C1.2
Revision:	0
Plot Date:	11/20/14
Scale:	AS SHOWN
Checked By:	MAW
Drawn By:	JRB
Designed By:	JRB
Project:	2129036.2

MARK A. WELLS
18685
STATE OF WEST VIRGINIA
REGISTERED PROFESSIONAL ENGINEER

Drawing Description

TRIAD HUNTER, LLC.
TYLER COUNTY, WEST VIRGINIA
WELLS-MECKLEY LOCATION AS-BUILT
AS-BUILT/SEDIMENT & EROSION CONTROL PLAN (2 OF 2)

Rev.	Description	By	Date
0	ISSUED FOR PERMIT	MAW	11/20/14

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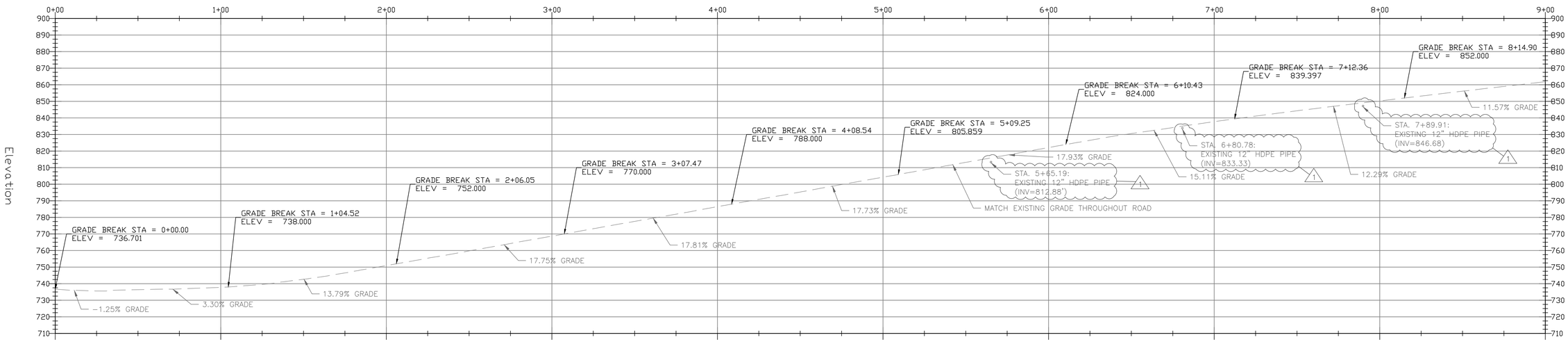
EXISTING MAIN ACCESS ROAD PROFILE



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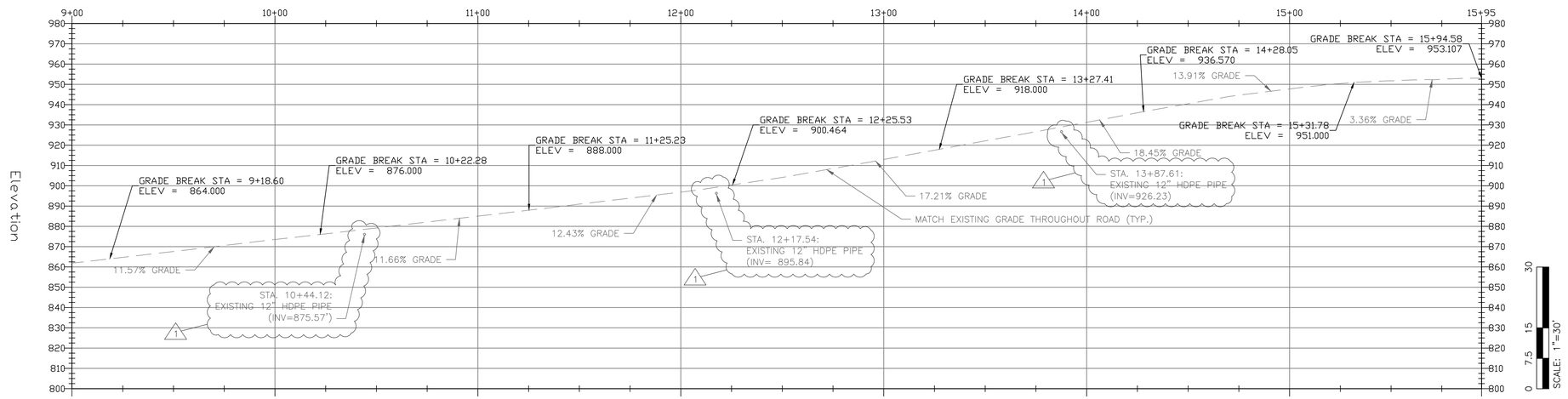
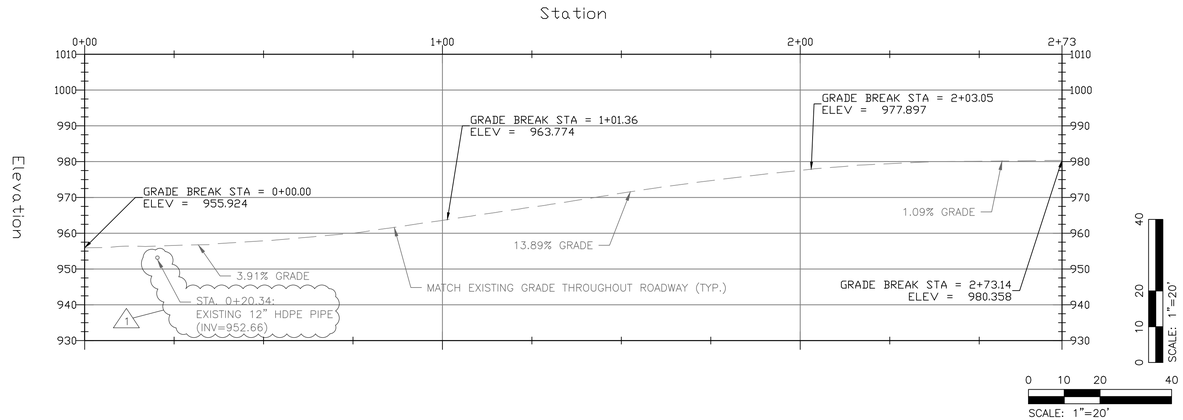


PRODUCTION PAD ACCESS ROAD PROFILE



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Rev.	Description	By	Date
0	ISSUED FOR PERMIT	MAW	03/30/15
1	ISSUED FOR PERMIT	MAW	11/20/14

Drawing Description

TRIAD HUNTER, LLC.
TYLER COUNTY, WEST VIRGINIA
WELLS-MECKLEY LOCATION AS-BUILT
ACCESS ROAD PROFILES

MARK A. WELCH
REGISTERED
18685
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

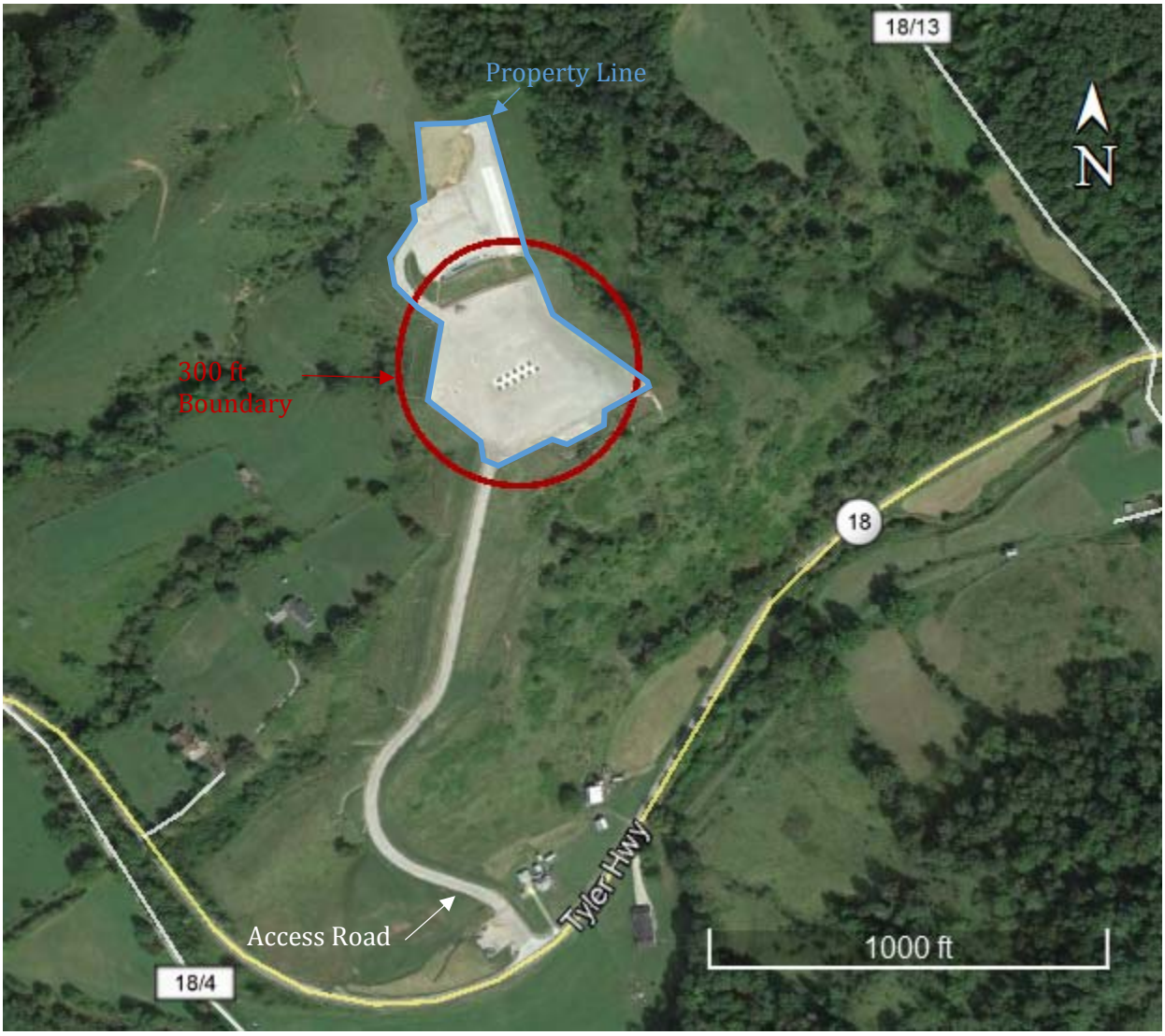
Project: 2129036.2
Designed By: JRB
Drawn By: JRB
Checked By: MAW
Scale: AS SHOWN
Plot Date: 03/30/15
Revision: 1

Drawing Number:
C2.1

ATTACHMENT G

Area Map

Wells Meckley Wellpad Location



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 / Emission Reduction Devices 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]
C001	S001 - S004	Condensate Storage Vessels	TBD	TBD	500 bbl each	New	C001	N/A
C001	S005 - S008	Produced Water Storage Vessels	TBD	TBD	500 bbl each	New	C001	N/A
C001	S009	Controlled Liquid Loading - Produced Water	TBD	TBD	N/A	New	C001	N/A
C001	S009	Controlled Liquid Loading - Condensate	TBD	TBD	N/A	New	C001	N/A
E010	S010	GPU Heater - 2.0 MMBtu/hr	TBD	TBD	2.0 MMBtu/hr	New	N/A	N/A
E011	S011	GPU Heater - 2.0 MMBtu/hr	TBD	TBD	2.0 MMBtu/hr	New	N/A	N/A
E012	S012	GPU Heater - 2.0 MMBtu/hr	TBD	TBD	2.0 MMBtu/hr	New	N/A	N/A
E013	S013	GPU Heater - 2.0 MMBtu/hr	TBD	TBD	2.0 MMBtu/hr	New	N/A	N/A
E014	S014	GPU Heater - 2.0 MMBtu/hr	TBD	TBD	2.0 MMBtu/hr	New	N/A	N/A
E015	S015	GPU Heater - 2.0 MMBtu/hr	TBD	TBD	2.0 MMBtu/hr	New	N/A	N/A
E016	S016	Heater Treater - 1.0 MMBtu/hr	TBD	TBD	1.0 MMBtu/hr	New	N/A	N/A
E017	S017	Heater Treater - 1.0 MMBtu/hr	TBD	TBD	1.0 MMBtu/hr	New	N/A	N/A
E018	S018	Caterpillar 3516B LE	TBD	TBD	1,380 hp	New	C003	N/A
E019	S019	Caterpillar 3516B LE	TBD	TBD	1,380 hp	New	C004	N/A
E020	S020	Caterpillar 3306B TA	TBD	TBD	206 hp	New	C005	N/A
E021	S021	VRU Engine	TBD	TBD	52.4 hp	New	C006	N/A
E023	S022	Dehydration Unit - Still Vent	TBD	TBD	42 MMscf/day	New	C002, S023	N/A
C001	S022	Dehydration Unit - Flash Tank	TBD	TBD	N/A	New	C001	N/A
E023	S023	Reboiler - 0.75 MMBtu/hr	TBD	TBD	0.75 MMBtu/hr	New	N/A	N/A
C001	C001	Enclosed Combustor	TBD	TBD	10 MMBtu/hr	New	N/A	N/A
E009	S009	Uncaptured Liquid Loading - Produced Water	TBD	TBD	N/A	New	N/A	N/A
E009	S009	Uncaptured Liquid Loading - Condensate	TBD	TBD	N/A	New	N/A	N/A
C002	C002	BTEX Condenser	TBD	TBD	N/A	New	N/A	N/A

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

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 Components

Leak Detection Method Used	☐ Audible, visual, and olfactory (AVO) inspections	☐ Infrared (FLIR) cameras	☒ Other (please describe) Optical gas imaging, as required by NSPS OOOOa	☐ 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	8	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)	☐ Gas ☒ Liquid ☐ Both	1.00	0.02	0.26
Valves	☐ Yes ☒ No	397	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)	☐ Gas ☐ Liquid ☒ Both	4.69	0.11	33.42
Safety Relief Valves	☐ Yes ☒ No	17	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)	☐ Gas ☐ Liquid ☒ Both	0.85	0.02	8.21
Open Ended Lines	☐ Yes ☒ No	35	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)	☐ Gas ☐ Liquid ☒ Both	0.17	<0.01	4.37
Sampling Connections	☐ Yes ☒ No	0	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)	☐ Gas ☐ Liquid ☐ Both	N/A	N/A	N/A
Connections (Not sampling)	☐ Yes ☒ No	1,776	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)	☐ Gas ☐ Liquid ☒ Both	1.25	0.03	18.07
Compressors	☐ Yes ☒ No	4	Engineering estimate	☒ Gas ☐ Liquid ☐ Both	4.12	0.09	185.51
Flanges	☐ Yes ☒ No	888	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)	☐ Gas ☐ Liquid ☒ Both	0.72	0.02	6.78

Other[1]	☐ Yes ☒ No	30	40 CFR 98 Subpart W, Table W-1A	☐ Gas ☐ Liquid ☐ Both	9.77	0.22	440.08

[1] Other equipment types may include compressor seals, relief valves, diaphragms, drains, meters, etc. Includes intermittent bleed pneumatic controllers.

Please provide an explanation of the sources of fugitive emissions (e.g. pigging operations, equipment blowdowns, pneumatic controllers, etc.):
Piping components, intermittent bleed pneumatic controllers, compressor blowdowns.

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 Affected Facility Data Sheet

ATTACHMENT K – GAS WELL AFFECTED FACILITY DATA SHEET				
Complete this data sheet if you are the owner or operator of a gas well affected facility for which construction, modification or reconstruction commenced after August 23, 2011. This form must be completed for natural gas well affected facilities regardless of when flowback operations occur (or have occurred).				
API Number	**Date of Flowback**	**Date of Well Completion**	**Green Completion and/or Combustion Device**	**Subject to OOOO or OOOOa?**
047-095-02155	TBD	TBD	TBD	OOOOa
047-095-02154	TBD	TBD	TBD	OOOOa
047-095-02153	TBD	TBD	TBD	OOOOa
047-095-02152	TBD	TBD	TBD	OOOOa
047-095-02151	3/31/16 through 4/12/16	TBD[1]	Combustion Device	OOOOa
PLANNED	TBD	TBD	TBD	OOOOa

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

This is the same API (American Petroleum Institute) well number(s) provided in the well completion notification and as provided to the WVDEP, Office of Oil and Gas for the well permit. The API number 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.

[1] Only 7 out of 40 stages have been fractured. Well has yet to be completed.

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:

See ProMax® output in Attachment T

☒ 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 Condensate Storage Tanks	2. Tank Name S001 – S004
3. Emission Unit ID number S001 – S004	4. Emission Point ID number C001
5. Date Installed , Modified or Relocated *(for existing tanks)* N/A 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 ☐ 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.
500 bbl

9A. Tank Internal Diameter (ft.) ~12	9B. Tank Internal Height (ft.) ~25
10A. Maximum Liquid Height (ft.) ~25	10B. Average Liquid Height (ft.) ~12
11A. Maximum Vapor Space Height (ft.) ~25	11B. Average Vapor Space Height (ft.) ~12

12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume". 500 bbl

13A. Maximum annual throughput (gal/yr) 25,423,272	13B. Maximum daily throughput (gal/day) 69,653
14. Number of tank turnovers per year 1210	15. Maximum tank fill rate (gal/min) TBD

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]
Vacuum Setting Pressure Setting
☒ Emergency Relief Valve (psig)
Vacuum Setting 8 oz Pressure Setting 16 oz
☒ Thief Hatch Weighted ☐ Yes ☒ No – Locked

[1] Complete appropriate Air Pollution Control Device Sheet

20. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application). See calculations in Attachment T for full speciation.

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	
VOC	8.00	35.03	0.08	0.36	0.21	0.94	8.30	36.34	O - ProMax®
Benzene	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	O - ProMax®
Toluene	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	O - ProMax®
Ethylbenzene	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	O - ProMax®
Xylenes	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	O - ProMax®
n-Hexane	0.26	1.13	<0.01	0.01	0.01	0.03	0.27	1.17	O - ProMax®
Total HAP	0.28	1.22	<0.01	0.01	0.01	0.03	0.29	1.26	O - ProMax®

[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) Welded			
21A. Shell Color: Light gray	21B. Roof Color: Light gray	21C. Year Last Painted: New	
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: N/A	22C. If yes, how is heat provided to tank? N/A	
23. Operating Pressure Range (psig): < 10 oz to 16 oz **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): N/A	24B. If yes, for cone roof, provide slop (ft/ft): 0.0833	
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			
29. Provide the city and state on which the data in this section are based: Columbus, OH			
30. Daily Avg. Ambient Temperature (°F): 52.9	31. Annual Avg. Maximum Temperature (°F): 61.5		
32. Annual Avg. Minimum Temperature (°F): 41.8	33. Avg. Wind Speed (mph): 8.5		
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day): 1,123	35. Atmospheric Pressure (psia): 14.33		
LIQUID INFORMATION			
36. Avg. daily temperature range of bulk liquid (°F): N/A	36A. Minimum (°F): N/A	36B. Maximum (°F): 85	
37. Avg. operating pressure range of tank (psig): < 10 oz to 16 oz	37A. Minimum (psig): < 10 oz	37B. Maximum (psig): 16 oz	
38A. Minimum liquid surface temperature (°F): 68.11 (est.)	38B. Corresponding vapor pressure (psia): 10.94 (est.)		
39A. Avg. liquid surface temperature (°F): 75.9	39B. Corresponding vapor pressure (psia): 12.19		
40A. Maximum liquid surface temperature (°F): 83.69	40B. Corresponding vapor pressure (psia): 13.4 (est.)		
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:	Condensate		
41B. CAS number:			
41C. Liquid density (lb/gal):	5.81		
41D. Liquid molecular weight (lb/lb-mole):	97.15		
41E. Vapor molecular weight (lb/lb-mole):	53.46		
41F. Maximum true vapor pressure (psia):	17.855		
41G. Maximum Reid vapor pressure (psia):	15.1		
41H. Months Storage per year. From: Jan To: Dec	12		

42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.	Temperature: 85 F Vapor Pressure: 3.16 psig		

GENERAL INFORMATION (REQUIRED)

1. Bulk Storage Area Name: Produced Water Storage Tanks	2. Tank Name S005 - S008
3. Emission Unit ID number S005 – S008	4. Emission Point ID number C001
5. Date Installed , Modified or Relocated *(for existing tanks)* N/A 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 ☐ 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. 500 bbl	
9A. Tank Internal Diameter (ft.) ~12	9B. Tank Internal Height (ft.) ~25
10A. Maximum Liquid Height (ft.) ~25	10B. Average Liquid Height (ft.) ~12
11A. Maximum Vapor Space Height (ft.) ~25	11B. Average Vapor Space Height (ft.) ~12
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume". 500 bbl	
13A. Maximum annual throughput (gal/yr) 33,434,730	13B. Maximum daily throughput (gal/day) 91,602
14. Number of tank turnovers per year 1592	15. Maximum tank fill rate (gal/min) TBD
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]

Vacuum Setting Pressure Setting

☒ Emergency Relief Valve (psig)

Vacuum Setting 8 oz Pressure Setting 16 oz

☒ Thief Hatch Weighted ☐ Yes ☒ No - Locked

[1] Complete appropriate Air Pollution Control Device Sheet

20. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application). See calculations in Attachment T for full speciation.

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	
VOC	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	O - ProMax®
Benzene	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	O - ProMax®
Toluene	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	O - ProMax®
Ethylebenzene	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	O - ProMax®
Xylenes	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	O - ProMax®
n-Hexane	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	O - ProMax®
Total HAP	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	O - ProMax®

[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) Welded

21A. Shell Color: Light gray	21B. Roof Color: Light gray	21C. Year Last Painted: New

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: N/A	22C. If yes, how is heat provided to tank? N/A

23. Operating Pressure Range (psig): < 10 oz to 16 oz

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): N/A	24B. If yes, for cone roof, provide slop (ft/ft): 0.0833

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			
29. Provide the city and state on which the data in this section are based: Columbus, OH			
30. Daily Avg. Ambient Temperature (°F): 52.9		31. Annual Avg. Maximum Temperature (°F): 61.5	
32. Annual Avg. Minimum Temperature (°F): 41.8		33. Avg. Wind Speed (mph): 8.5	
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day): 1,123		35. Atmospheric Pressure (psia): 14.33	
LIQUID INFORMATION			
36. Avg. daily temperature range of bulk liquid (°F): N/A	36A. Minimum (°F): N/A	36B. Maximum (°F): 85	
37. Avg. operating pressure range of tank (psig): < 10 oz to 16 oz	37A. Minimum (psig): < 10 oz	37B. Maximum (psig): 16 oz	
38A. Minimum liquid surface temperature (°F): 49.91 (est)		38B. Corresponding vapor pressure (psia): 9.99 (est.)	
39A. Avg. liquid surface temperature (°F): 57.7		39B. Corresponding vapor pressure (psia): 11.55	
40A. Maximum liquid surface temperature (°F): 65.49		40B. Corresponding vapor pressure (psia): 13.11 (est.)	
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:	Produced Water		
41B. CAS number:			
41C. Liquid density (lb/gal):	8.31		
41D. Liquid molecular weight (lb/lb-mole):	18.02		
41E. Vapor molecular weight (lb/lb-mole):	19.8		
41F. Maximum true vapor pressure (psia):	16.8		
41G. Maximum Reid vapor pressure (psia):	1.0		
41H. Months Storage per year. From: Jan To: Dec	12		
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.	Temperature: 85 F Gauge Pressure: 0.2 psig		

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]
T01	New	Lube oil	250 gal
T02	New	Lube oil	250 gal
T03	New	Lube oil	250 gal

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

Small Heaters and Reboilers 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]
E010	S010	GPU Heater	TBD	New	2.0	~1,267
E011	S011	GPU Heater	TBD	New	2.0	~1,267
E012	S012	GPU Heater	TBD	New	2.0	~1,267
E013	S013	GPU Heater	TBD	New	2.0	~1,267
E014	S014	GPU Heater	TBD	New	2.0	~1,267
E015	S015	GPU Heater	TBD	New	2.0	~1,267
E016	S016	Heater Treater	TBD	New	1.0	~1,267
E017	S017	Heater Treater	TBD	New	1.0	~1,267
E023	S023	Reboiler	TBD	New	0.75	~1,267

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

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

3 New, modification, removal

4 Enter design heat input capacity in MMBtu/hr.

5 Enter the fuel heating value in BTU/standard cubic foot.

ATTACHMENT N

Internal Combustion Engines Data Sheet

ATTACHMENT N – INTERNAL COMBUSTION ENGINE DATA SHEET

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

Emission Unit ID#[1]	S018	S019	S020
Engine Manufacturer/Model	Caterpillar 3516B LE	Caterpillar 3516B LE	Caterpillar 3306B TA
Manufacturers Rated bhp/rpm	1,380	1,380	206
Source Status[2]	New	New	New
Date Installed/ Modified/Removed/Relocated[3]	TBD	TBD	TBD
Engine Manufactured /Reconstruction Date[4]	TBD	TBD	TBD
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]	4SLB	4SLB	4SRB
APCD Type[7]	OxCat	OxCat	NSCR
Fuel Type[8]	RG	RG	RG
H_2S (gr/100 scf)	Negl.	Negl.	Negl.
Operating bhp/rpm	1,380	1,380	206
BSFC (BTU/bhp-hr)	7,301	7,301	8,066
Hourly Fuel Throughput	7952 ft^3/hr gal/hr	7952 ft^3/hr gal/hr	1,311 ft^3/hr gal/hr
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	69.7 MMft^3/yr gal/yr	69.7 MMft^3/yr gal/yr	11.5 MMft^3/yr gal/yr
Fuel Usage or Hours of Operation Metered	Yes ☒ No ☐	Yes ☒ No ☐	Yes ☒ No ☐

Calculation Methodology[9]	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]
MD	NO_x	1.52	6.66	1.52	6.66	0.23	0.99
MD	CO	0.64	2.80	0.64	2.80	0.91	2.98
MD	VOC	1.55	6.80	1.55	6.80	0.05	0.24
AP	SO_2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AP	PM_{10}	0.10	0.44	0.10	0.44	0.03	0.14
AP	Formaldehyde	0.30	1.33	0.03	0.12	0.03	0.12
AP	Total HAPs	0.50	2.19	0.05	0.21	0.05	0.21
OT – MD and 40 CFR Subpart C	GHG (CO_2e)	1,443	6,322	1,443	6,322	234	1,023

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]		S021					
Engine Manufacturer/Model		CSI Compressco/GasJack GJ230					
Manufacturers Rated bhp/rpm		52.4					
Source Status[2]		New					
Date Installed/ Modified/Removed/Relocated[3]		TBD					
Engine Manufactured /Reconstruction Date[4]		TBD					
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]		4SRB					
APCD Type[7]		NSCR					
Fuel Type[8]		RG					
H_2S (gr/100 scf)		Negl.					
Operating bhp/rpm		52.4					
BSFC (BTU/bhp-hr)		10.7775					
Hourly Fuel Throughput		0.45 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)		3.9E-03 $MMft^3$/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 ☐	
Calculation Methodology[9]	**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]**
MD	NO_x	0.06	0.25				
MD	CO	0.12	0.51				
MD	VOC	0.08	0.35				
AP	SO_2	<0.01	<0.01				
AP	PM_{10}	<0.01	<0.01				
AP	Formaldehyde	<0.01	<0.01				
AP	Total HAPs	<0.01	<0.01				
OT – MD and 40 CFR Subpart C	GHG (CO_2e)	0.07	0.29				

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# S018, 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: N/A

Manufacturer: DCL	Model #: DC64
Design Operating Temperature: 750-1250 ºF	Design gas volume: 9103 acfm
Service life of catalyst: 3-4 years	Provide manufacturer data? ☒Yes ☐ No
Volume of gas handled: 9103 acfm at ºF	Operating temperature range for NSCR/Ox Cat: From 750 ºF to 1250 ºF
Reducing agent used, if any: N/A	Ammonia slip (ppm): N/A

Pressure drop against catalyst bed (delta P): 3.4 inches of H_2O

Provide description of warning/alarm system that protects unit when operation is not meeting design conditions: Catalyst inlet temperature probe set to shut down engine @ 1250 degrees F.

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)?
3-4 years

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,

Engine Air Pollution Control Device
(Emission Unit ID# S019, 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: N/A

Manufacturer: DCL	Model #: DC64
Design Operating Temperature: 750-1250 ºF	Design gas volume: 9103 acfm
Service life of catalyst: 3-4 years	Provide manufacturer data? ☒Yes ☐ No
Volume of gas handled: 9103 acfm at ºF	Operating temperature range for NSCR/Ox Cat: From 750 ºF to 1250 ºF
Reducing agent used, if any: N/A	Ammonia slip (ppm): N/A

Pressure drop against catalyst bed (delta P): 3.4 inches of H_2O

Provide description of warning/alarm system that protects unit when operation is not meeting design conditions: Catalyst inlet temperature probe set to shut down engine @ 1250 degrees F.

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)?
3-4 years

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,

Engine Air Pollution Control Device (Emission Unit ID# S020, 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: N/A

Manufacturer: Miratech	Model #: RCS-1826
Design Operating Temperature: 750-1250 ºF	Design gas volume: +/- 970 acfm
Service life of catalyst: 1-2 years	Provide manufacturer data? ☒Yes ☐ No
Volume of gas handled: +/- 970 acfm at 750-1250 ºF	Operating temperature range for NSCR/Ox Cat: From 750 ºF to 1250 ºF
Reducing agent used, if any: N/A	Ammonia slip (ppm): N/A

Pressure drop against catalyst bed (delta P): 2.0 inches of H_2O

Provide description of warning/alarm system that protects unit when operation is not meeting design conditions: Catalyst is equipped with inlet temperature probes; high inlet temp engine shutdown at 1250 degrees F.

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)?
1-2 years

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,

Engine Air Pollution Control Device (Emission Unit ID# S021, 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: N/A

Manufacturer: Emit Technologies	Model #: Dual, Enclosed, T-Type
Design Operating Temperature: 1000 ºF	Design gas volume: 195 scfm
Service life of catalyst: 1 year or 8760 hours	Provide manufacturer data? ☒Yes ☐ No
Volume of gas handled: 66.1 scfm at 960 ºF	Operating temperature range for NSCR/Ox Cat: From 750 ºF to 1250 ºF
Reducing agent used, if any: N/A	Ammonia slip (ppm): N/A

Pressure drop against catalyst bed (delta P): TBD inches of H_2O

Provide description of warning/alarm system that protects unit when operation is not meeting design conditions: Catalyst is equipped with inlet temperature probes; high inlet temp engine shutdown at 1250 degrees F.
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)? 1 year or 8760 hours
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,

DCL America Inc.
12620 FM 1960 W, Ste A4 Box # 560, Houston, TX 77065
Tel.: 877-897-9759 Fax: 281-605-5858 E-mail: info@dclamerica.com

To	Joel LeBlanc	**Phone**	
	USA Compression	**Fax**	
Date	October 20,2017	**Email**	jleblanc@usacompression.com

RE: Emissions Statement

ENGINE DATA

Engine model	**Caterpillar G3306TA**
Power	203 hp
Fuel	NG – Per Supplied GERP
Exhaust Flow	1459 lb/hr
Exhaust Temperature	1091 F

CATALYST SYSTEM DATA

Catalyst Housing	RCS-1816
Catalyst Element	IQ16
Catalyst Diameter	14.75” x 3” w/bonnet
Catalyst Type	NSCR
Number of Elements	1
Cell Density	300 cpsi

EMISSION REQUIREMENTS

Exhaust Gas Component	Engine Output (g/bhp-hr)	Converter Output (g/bhp-hr)	Converter Output (% Reduction)
NOx	15.89	.50	97
CO	15.89	2	87.4
VOC (NMNEHC)	.23	.12	50
HCHO	.25	.06	76

Regards,

Sam Kirk
Sales Manager – Gas Compression
DCL America
281-253-3091

DCL America Inc.
12620 FM 1960 W, Ste A4 Box # 560, Houston, TX 77065
Tel.: 877-897-9759 Fax: 281-605-5858 E-mail: info@dclamerica.com

To	Joel LeBlanc	**Phone**	
	USA Compression	**Fax**	
Date	October 20, 2017	**Email**	

RE: Emissions Statement

ENGINE DATA

Engine model	**Cat 3516B**
Power	1380 bhp
Fuel	NG – Per supplied GERP
Exhaust Flow	14452 lb/hr
Exhaust Temperature	770˚F

CATALYST SYSTEM DATA

Catalyst Housing	DCL DC64L2-16 HGS+
Catalyst Element	DC64A (365K-12-4A64-31)
Catalyst Type	Oxidation A Coat
Element Dimensions	24.23” x 3.7”
Number of Elements	2
Cell Density	300 cpsi

EMISSION REQUIREMENTS

Exhaust Gas Component	Engine Output g/bhp-hr	Converter Output g/bhp-hr	Converter Output % Reduction
NOx	.50	.50	--
CO	2.93	.21	93
VOC	1.02	.51	50
CH2O	.40	.10	76

The catalyst model selection is based upon the reduction requirements above. Any variance in these requirements may affect the price and model required.

Regards,

Sam Kirk
Sales Manager – Gas Compression
DCL America
281-253-3091

Prepared For:
Chuck Kirk
CSI Compressco

Date: October 20, 2017

APPLICATION INFORMATION

DRIVER

Make:	CSI Compressco
Model:	GasJack
Horsepower:	52.4
RPM:	1800
Compression Ratio:	N/A
Exhaust Flow Rate:	195
Exhaust Temperature:	1000
Reference:	N/A
Fuel:	Natural Gas
Annual Operating Hours:	8760

UNCONTROLLED EMISSIONS DATA

	g/bhp-hr	lb/hr	Tons/Year
NO_x:	11.00	1.27	5.57
CO:	17.20	1.99	8.70
THC:	N/A	N/A	N/A
NMHC:	N/A	N/A	N/A
NMNEHC:	N/A	N/A	N/A
HCHO:	N/A	N/A	N/A
Oxygen:	0.30%		

CATALYST ELEMENT

Model:	Dual, Enclosed, T-Type
Catalyst Type:	NSCR, Standard Precious Metals Group
Substrate Type:	Brazed
Element Size:	Round, 4" x 3.5"
Element Quantity:	1

POST CATALYST EMISSIONS DATA

	g/bhp-hr	lb/hr
NO_x:	< 0.50	0.06
CO	< 1.00	0.12
VOC	< 0.70	0.08

****POST CATALYST EMISSIONS ARE ONLY GUARANTEED FOR CATALYST ELEMENTS SUPPLIED BY EMIT**

ATTACHMENT O

Tank Truck / Railcar 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#: S009	Emission Point ID#: C001 / E009	Year Installed/Modified: TBD
Emission Unit Description: Tank truck loading of condensate and produced water		
Loading Area Data		
Number of Pumps: TBD	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: Annually tested for leaks		
Provide description of closed vent system and any bypasses. Truck loading will be vapor balanced		
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	
Max. Daily Throughput (1000 gal/day)	69.653	91.602	
Max. Annual Throughput (1000 gal/yr)	25,423.272	33,434.730	
Loading Method[1]	SUB	SUB	
Max. Fill Rate (gal/min)	TBD	TBD	
Average Fill Time (min/loading)	TBD	TBD	
Max. Bulk Liquid Temperature (°F)	85	85	
True Vapor Pressure[2]	17.9 psia	16.8 psia	
Cargo Vessel Condition[3]	U	U	
Control Equipment or Method[4]	VB, ECD	VB, ECD	
Max. Collection Efficiency (%)	99.2%	99.2%	

Max. Control Efficiency (%)		98%	98%	
Max.VOC Emission Rate	Loading (lb/hr)	0.33 Uncaptured 0.81 Controlled	<0.01 Uncaptured <0.01 Controlled	
	Annual (ton/yr)	1.43 Uncaptured 3.54 Controlled	<0.01 Uncaptured <0.01 Controlled	
Max.HAP Emission Rate	Loading (lb/hr)	0.01 Uncaptured 0.02 Controlled	<0.01 Uncaptured <0.01 Controlled	
	Annual (ton/yr)	0.04 Uncaptured 0.11 Controlled	<0.01 Uncaptured <0.01 Controlled	
Estimation Method[5]		O – ProMax®	O – 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 Dehydration Unit Data Sheet

ATTACHMENT P – GLYCOL DEHYDRATION UNIT DATA SHEET

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: Valerus	Model: 36" x 30' Contact Tower
Max. Dry Gas Flow Rate: 42 mmscf/day	Reboiler Design Heat Input: 0.75 MMBTU/hr
Design Type: ☒ TEG ☐ DEG ☐ EG	Source Status[1]: New
Date Installed/Modified/Removed[2]: TBD	Regenerator Still Vent APCD/ERD[3]: CC
Control Device/ERD ID#[3]: Still vent - C002, S023; Flash tank – C001	Fuel HV (BTU/scf): ~1,267
H_2S Content (gr/100 scf): Negl.	Operation (hours/year): 8,760
Pump Rate (gpm): 7.5	
Water Content (wt %) in: Wet Gas: 41.7 lb/MMascf	Dry Gas: 1.9 lb/MMscf

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 N/A

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

Recycling the glycol dehydration unit back to the flame zone of the reboiler. Still vent only
☒ 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 (%)
C001 (VOC and HAP)	98%
C002 and S023 (VOC and HAP)	95%

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)
S023	Reboiler Vent	AP	NO_x	0.07	0.32
		AP	CO	0.06	0.27
		AP	VOC	<0.01	0.02
		AP	SO_2	<0.01	<0.01
		AP	PM_{10}	<0.01	0.02
		AP	GHG (CO_2e)	87.84	384.73

S015	Glycol Regenerator Still Vent	GRI-GlyCalc™	VOC	0.24	1.03
		GRI-GlyCalc™	Benzene	<0.01	0.01
		GRI-GlyCalc™	Toluene	<0.01	<0.01
		GRI-GlyCalc™	Ethylbenzene	<0.01	<0.01
		GRI-GlyCalc™	Xylenes	<0.01	<0.01
		GRI-GlyCalc™	n-Hexane	<0.01	0.01
S015	Glycol Flash Tank	GRI-GlyCalc™	VOC	0.34	1.48
		GRI-GlyCalc™	Benzene	<0.01	<0.01
		GRI-GlyCalc™	Toluene	<0.01	<0.01
		GRI-GlyCalc™	Ethylbenzene	<0.01	<0.01
		GRI-GlyCalc™	Xylenes	<0.01	<0.01
		GRI-GlyCalc™	n-Hexane	0.01	0.03

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 Controllers Data Sheet

ATTACHMENT Q – PNEUMATIC CONTROLLERS DATA SHEET

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

☐ Yes ☒ No

Please list approximate number.

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

☐ Yes ☒ No

Please list approximate number.

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

☐ Yes ☒ No

Please list approximate number.

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

☐ Yes ☒ No

Please list approximate number.

ATTACHMENT R

Pneumatic Pump Data Sheet

ATTACHMENT R – PNEUMATIC PUMP DATA SHEET

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

☐ Yes ☒ No

Please list.

Source ID #	Date	Pump Make/Model	Pump Size

ATTACHMENT S

Air Pollution Control Device / Emission Reduction Device 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:	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#: C001	Installation Date: ☒ New ☐ Modified ☐ Relocated
Maximum Rated Total Flow Capacity scfh 60.2 Mscfd	Maximum Design Heat Input (from mfg. spec sheet) 10 MMBTU/hr Design Heat Content 2449 BTU/scf

Control Device Information

Type of Vapor Combustion Control?

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

Manufacturer: Hybon Model: CH10.0	Hours of operation per year? 8,760

List the emission units whose emissions are controlled by this vapor control device (Emission Point ID# E001-E009, E022 Flash Tank)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
S001-S008	Condensate and Produced Water Tanks	S009	Condensate and Produced Water Truck Loading
S022	Dehydration Unit Flash Tank		

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	20 feet	4.5 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
41.8 (scfm)	2449 BTU/ft^3	TBD (ft/s)

Provide an attachment with the characteristics of the waste gas stream to be burned. See ProMax® report in Attachment T.

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	20 scfh	0.02 BTU/hr	☒ Yes ☐ No

If automatic re-ignition is used, please describe the method. Automatic ignition and flame detection will be handled by a Profire 2100 burner management system.

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: See description above

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

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#: S023	Installation Date: ☒ New ☐ Modified ☐ Relocated	
Maximum Rated Total Flow Capacity 652.41 scfh 15.6 Mscfd	Maximum Design Heat Input (from mfg. spec sheet) 0.75 MMBTU/hr	Design Heat Content 1,267 BTU/scf

Control Device Information

Type of Vapor Combustion Control?

☒ Enclosed Combustion Device (Reboiler) ☐ Elevated Flare ☐ Ground Flare
☐ Thermal Oxidizer

Manufacturer: Valerus Model: 0.75 MMBtu/hr	Hours of operation per year? 8,760

List the emission units whose emissions are controlled by this vapor control device (Emission Point ID# E022 Still Vent)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
S022	Dehydration Unit Still Vent		

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

Assist Type (Flares only) N/A	Flare Height N/A	Tip Diameter N/A	Was the design per §60.18? N/A
☐ Steam ☐ Air ☐ Pressure ☐ Non	feet	feet	☐ Yes ☐ No Provide determination.

Waste Gas Information

Maximum Waste Gas Flow Rate	Heat Value of Waste Gas Stream	Exit Velocity of the Emissions Stream
14.22 (scfm)	1,141.68 BTU/ft^3	TBD (ft/s)

Provide an attachment with the characteristics of the waste gas stream to be burned. See GLYCalc report in Attachment T.

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?
0	scfh	BTU/hr	☒ Yes ☐ No

If automatic re-ignition is used, please describe the method. Automatic ignition and flame detection will be handled by a Profire 2100 burner management system.

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 See description above

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

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

General Information

Control Device ID#: C002	Installation Date: ☒ New ☐ Modified ☐ Relocated	
Manufacturer: Jatco	Model: 5-120	Control Device Name: BTEX Condenser
Control Efficiency (%): 95% (Combined with S023)		
Manufacturer's required temperature range for control efficiency. 32-225 °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 – N/A		
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

General Information

Emission Unit ID#: S021	Installation Date: ☒ New ☐ Modified ☐ Relocated

Device Information

Manufacturer: CSI Compresso
Model: GasJack GJ230

List the emission units whose emissions are controlled by this vapor recovery unit (Emission Point ID# ---)

Emission Unit ID#	Emission Source Description	Emission Unit ID#	Emission Source Description
---	Low pressure tower		

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

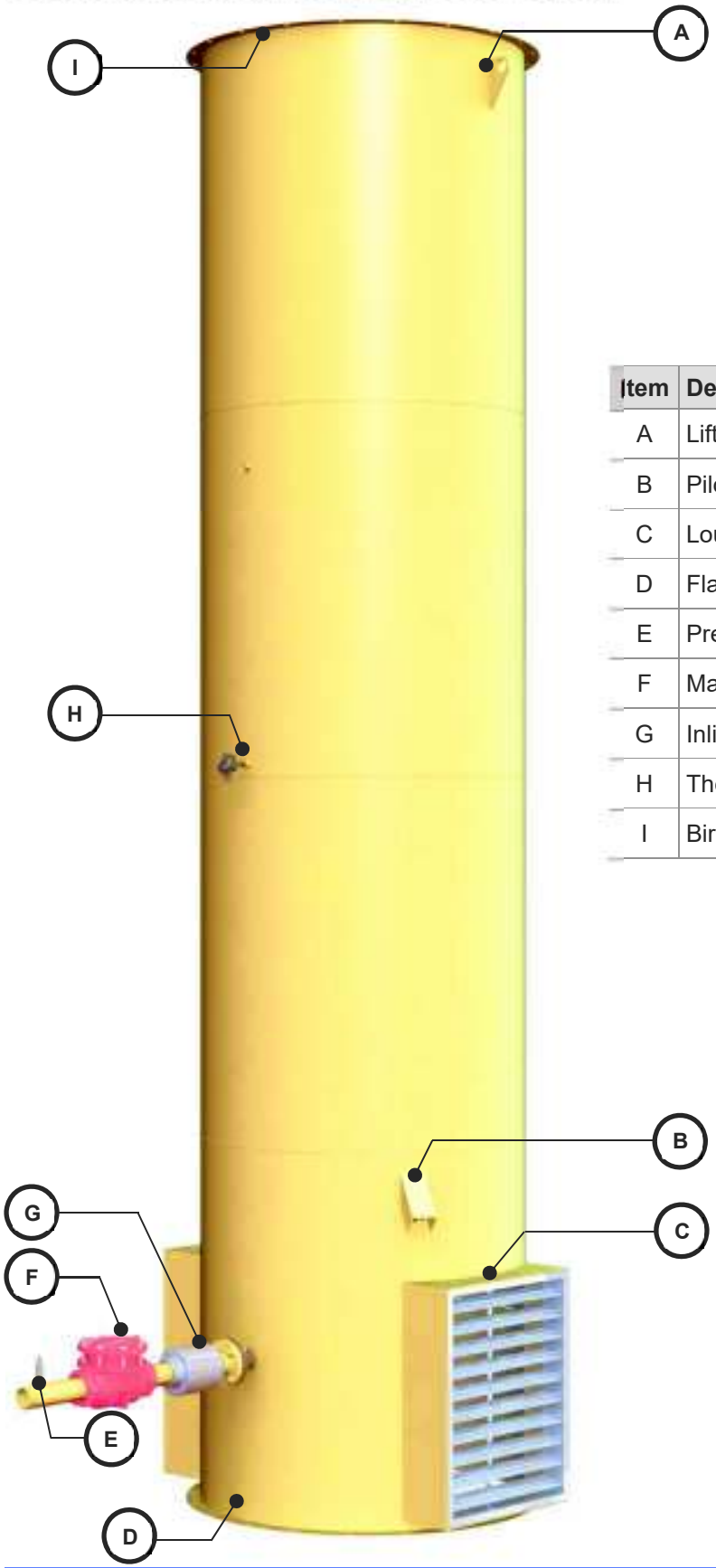
Additional information attached? ☒ Yes ☐ No
Please attach copies of manufacturer's data sheets, drawings, and performance testing.

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.

GENERAL ARRANGEMENT DRAWING



Item	Description
A	Lifting Eye
B	Pilot
C	Louvers
D	Flange for Attachment
E	Pressure Transducer
F	Main Gas Valve
G	Inline Flame Arrestor
H	Thermocouple
I	Bird Screen

PACKAGE DETAILS

COMBUSTOR & ASSOCIATED EQUIPMENT

A. CH10.0 ENCLOSED COMBUSTOR
   - EPA 40 CFR 60, Quad O Compliant
   - Burner Size: 10.0 MMBTU/hr
   - Nominal Operating Temperature: 1500 °F
   - Minimum Inlet Pressure: 1.5 oz/in^2
   - Smokeless Capacity: 100%
   - Destruction Efficiency: >99.9%
   - Dimensions: 54in OD x 20.0ft H (25ft w/ extension)
   - Turndown: Scalable
   - Ceramic insulation

B. INLINE FLAME ARRESTOR
   - 3” NPT WENCO
   - 5-Minute Burn Time

C. CONTROL VALVE
   - KIMRAY Low Pressure 212 FMT 4DA Double Acting Motor Valve
   - Operating Pressure: 22-25 psig

D. PILOT ASSEMBLY
   - Working Pressure: 5 psig
   - Flame Ionization Detection for rapid flame response
   - Fuel Consumption: 20 SCFH (natural gas) @ 5 psig

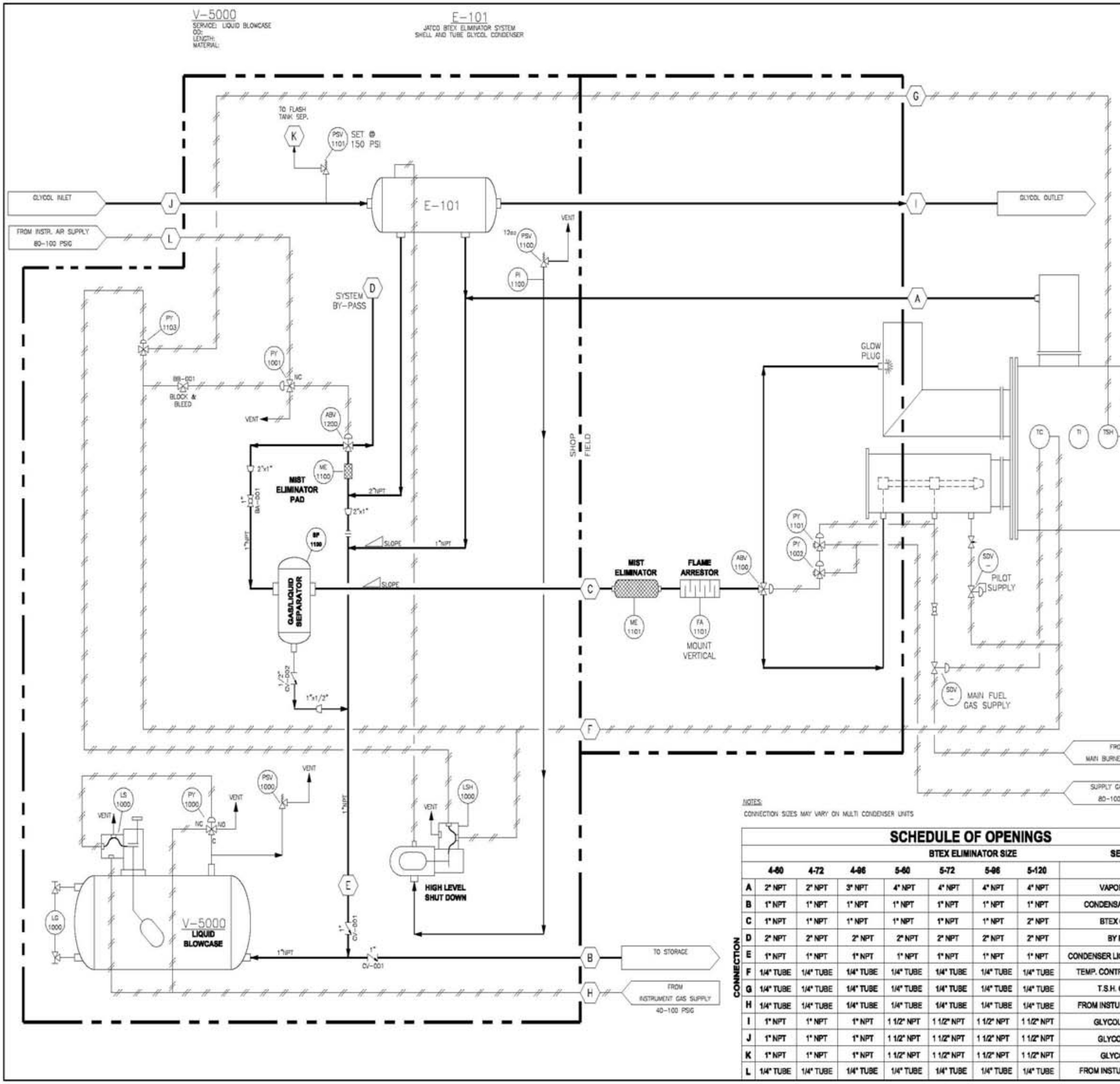
E. BIRD SCREEN
   - Stainless Steel

F. THERMOCOUPLE
   - Type K
   - Measures stack temperature
   - Ceramic, Mullite-grade sheathing

Operating Manual

Shell & Tube

JATCO Inc.



P&ID BILL OF MATERIAL

QTY	TAG	DESCRIPTION
1	ABV-1100	3-WAY ACTUATED BALL VALVE
1	ABV-1200	2", 3-WAY ACTUATED BALL VALVE
1	BA-001	1" BALL VALVE STAINLESS FULL-PORT
1	BB-001	1/4" BLOCK & BLEED P/N W 500P-4
2	CV-001	1" CHECK VALVE STAINLESS P/N P0195
2	CV-002	1/2" CHECK VALVE STAINLESS P/N P0049
1	FA-1101	FLAME ARRESTOR P/N 301-D-IL-AAC
1	LG-1000	LEVEL GAUGE COCKS P/N 20-150 BRASS
1	LS-1000	JATCO LEVEL CONTROL W/ INVALCO P/N 87000-209 SWITCH
1	LSH-1000	JATCO HIGH LEVEL CONTROL W/ INVALCO P/N P527814 SWITCH
1	ME-1100	MIST EXTRACTOR P/N 10201 2X6
1	ME-1101	MIST EXTRACTOR P/N 10201 2X6
1	PI-1100	GAUGE P/N G22680 0-15 OZ.
1	PSV-1000	1" 100 PSI PRV
1	PSV-1100	2" 12 OZ PRV
1	PSV-1101	150 PSI PRV
1	PY-1000	HUMPHREY 3 WAY PILOT VALVE P/N 250A-10-20 VAI
1	PY-1001	LOW PRESSURE 1/4" 3-WAY PILOT VALVE
1	PY-1002	1/4" 3-WAY PILOT VALVE
1	PY-1101	KIMRAY 30 PGR
1	PY-1103	KIMRAY 3 PGM RESET PILOT P/N YAS 3 PGM
1	SP-1100	JATCO STEAM SEPARATOR

NOTES:

CONNECTION SIZES MAY VARY ON MULTI CONDENSER UNITS

SCHEDULE OF OPENINGS

CONNECTION	BTEX ELIMINATOR SIZE							SERVICE
	4-60	4-72	4-96	5-60	5-72	5-96	5-120	
A	2" NPT	2" NPT	3" NPT	4" NPT	4" NPT	4" NPT	4" NPT	VAPOR INLET
B	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT	CONDENSATE OUTLET
C	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT	2" NPT	BTEX OUTLET
D	2" NPT	2" NPT	2" NPT	2" NPT	2" NPT	2" NPT	2" NPT	BY PASS
E	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT	CONDENSER LIQUID OUTLET
F	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	TEMP. CONTROLER SUPPLY
G	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	T.S.H. OUTPUT
H	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	FROM INSTUMENT GAS SUPPLY
I	1" NPT	1" NPT	1" NPT	1 1/2" NPT	1 1/2" NPT	1 1/2" NPT	1 1/2" NPT	GLYCOL OUTLET
J	1" NPT	1" NPT	1" NPT	1 1/2" NPT	1 1/2" NPT	1 1/2" NPT	1 1/2" NPT	GLYCOL INLET
K	1" NPT	1" NPT	1" NPT	1 1/2" NPT	1 1/2" NPT	1 1/2" NPT	1 1/2" NPT	GLYCOL PSV
L	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	1/4" TUBE	FROM INSTUMENT AIR SUPPLY

REV	DESCRIPTION	DATE	BY	CK
D	ADDED PY-1002	11/18/10	KG	SK
C	UPDATE BOM	9/27/10	KG	SK
B	REMOVED CHECK VALVE ON PY-1103	9/13/10	KG	SK
A	ISSUE FOR APPROVAL	3/11/10	KG	

JATCO, INC.
ENVIRONMENTAL PROTECTION EQUIPMENT

DATE	DRAWN	CHECKED	APPROVED
3/11/10	KG	-----	-----

CLIENT: –

TITLE: P&ID BTEX ELIMINATOR SHELL AND TUBE 1" CONTROLS

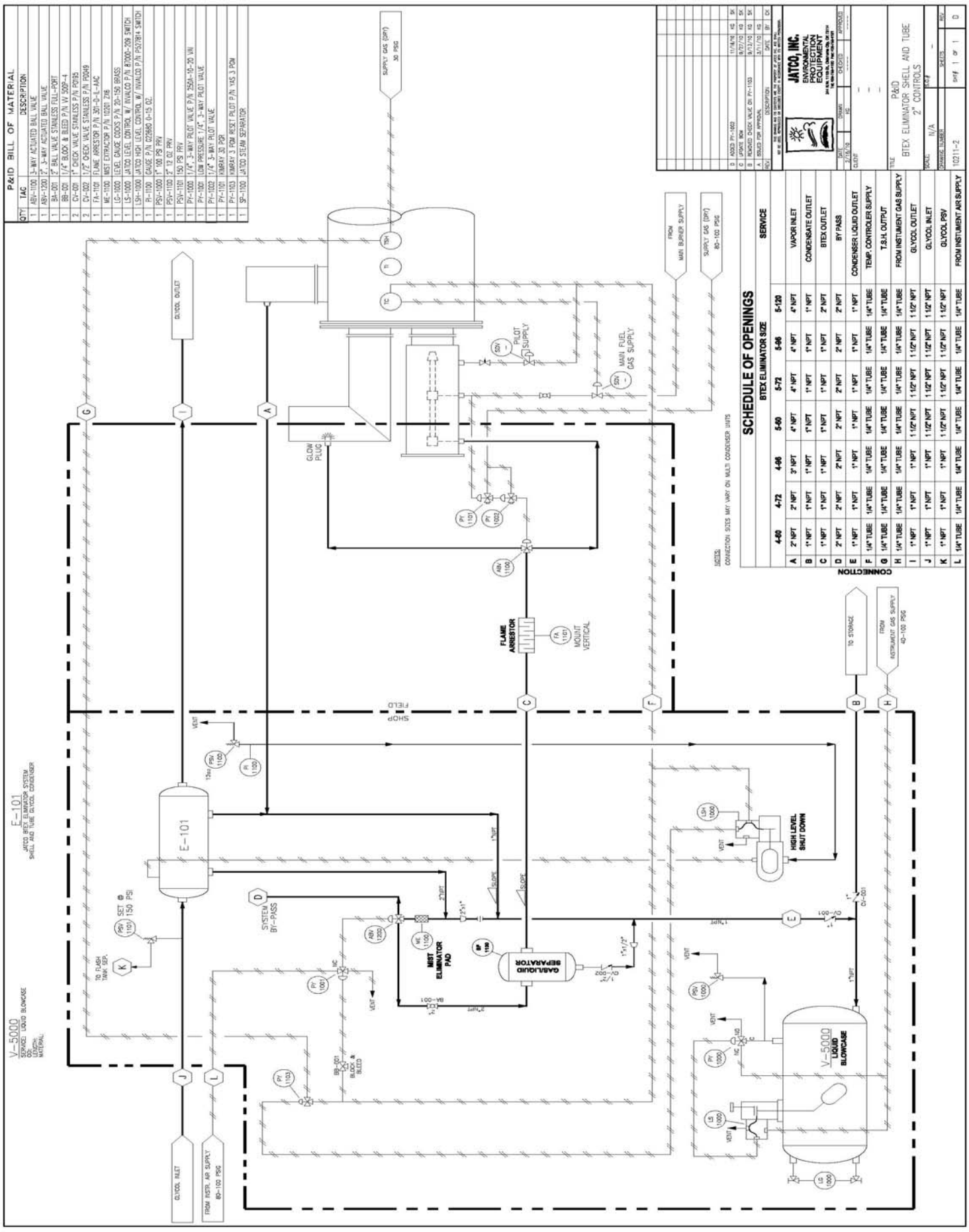
SCALE: AS NOTED

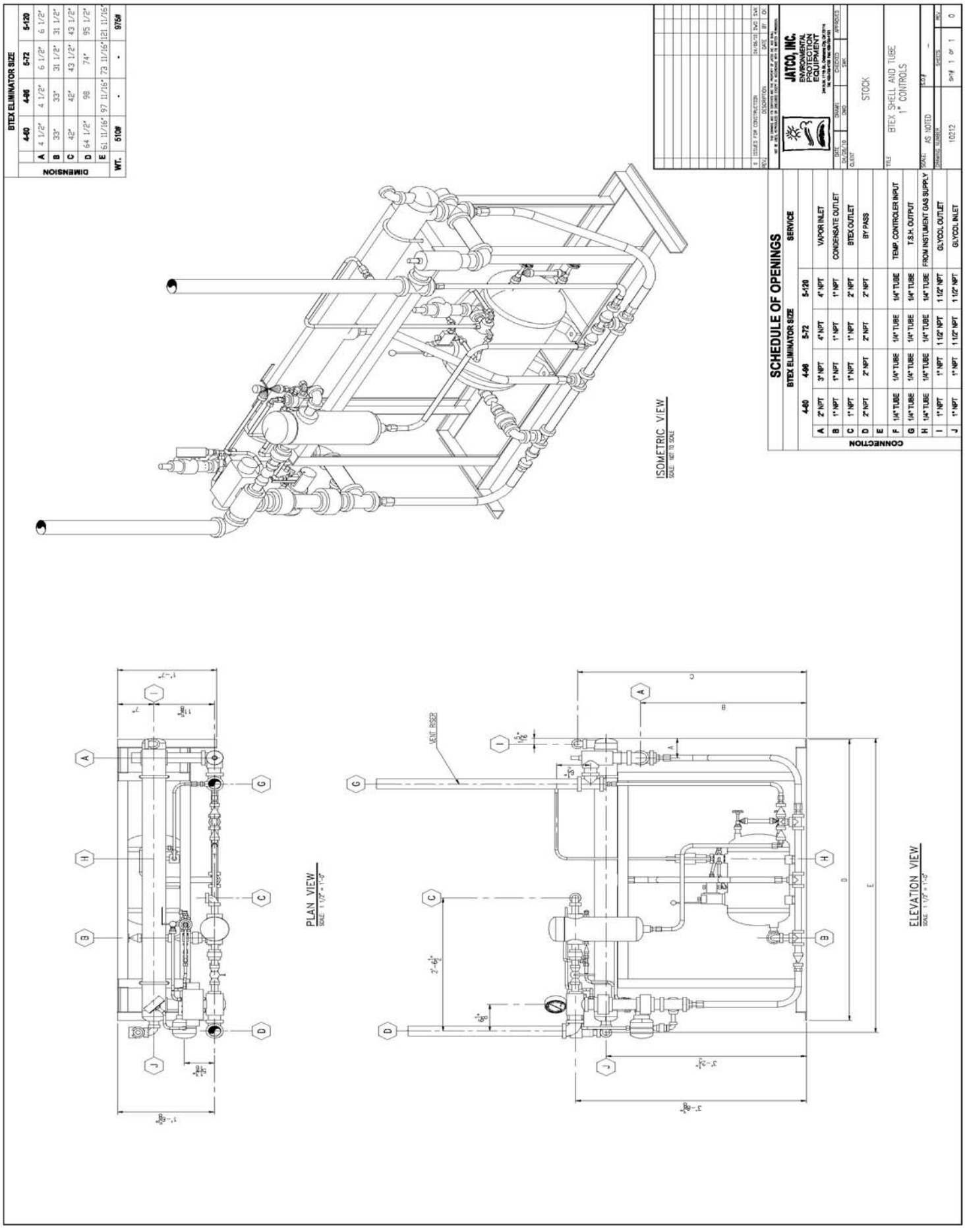
S.O.#: –

DRAWING NUMBER: 10211-1

SHEETS: SHT# 1 OF 1

REV: D


P&ID BILL OF MATERIAL
QTY TAG DESCRIPTION
1 ABV-1100 3-WAY ACTUATED BALL VALVE
1 ABV-1200 2" 3-WAY ACTUATED BALL VALVE
1 BA-001 2" BALL VALVE STAINLESS FULL-PORT
1 BB-001 1/4" BLOCK & BLEED P/N W 500P-4
2 CV-001 1" CHECK VALVE STAINLESS P/N P0795
2 CV-002 1/2" CHECK VALVE STAINLESS P/N P0049
1 FA-1101 FLAME ARRESTOR P/N 301-0-1-AAC
1 ME-1100 MIST EXTRACTOR P/N 10201 Z06
1 LG-1000 LEVEL GAUGE COCKS P/N 70-150 BRASS
1 LS-1000 JATCO LEVEL CONTROL W/ INVALCO P/N 87000-209 SWITCH
1 LSH-1000 JATCO HIGH LEVEL CONTROL W/ INVALCO P/N P437814 SWITCH
1 PI-1100 GAUGE P/N 0225860 0-15 OZ.
1 PSV-1000 1" 100 PSI PRV
1 PSV-1100 2" 12 OZ PRV
1 PSV-1101 150 PSI PRV
1 PY-1000 1/4" 3-WAY PILOT VALVE P/N 250A-10-20 VAI
1 PY-1001 LOW PRESSURE 1/4" 3-WAY PILOT VALVE
1 PY-1002 1/4" 3-WAY PILOT VALVE
1 PY-1101 HONEYWELL 3R PSR
1 PY-1103 HONEYWELL 3 PSM RESET PILOT P/N V45 3 PSM
1 SP-1100 JATCO STEAM SEPARATOR
SCHEDULE OF OPENINGS
BTEX ELIMINATOR SIZE
CONNECTION
SERVICE
4-60 4-72 4-96 5-60 5-72 5-96 5-120
A 2" NPT 2" NPT 3" NPT 4" NPT 4" NPT 4" NPT 4" NPT VAPOR INLET
B 1" NPT 1" NPT 1" NPT 1" NPT 1" NPT 1" NPT 1" NPT CONDENSATE OUTLET
C 1" NPT 1" NPT 1" NPT 1" NPT 1" NPT 1" NPT 2" NPT BTEX OUTLET
D 2" NPT 2" NPT 2" NPT 2" NPT 2" NPT 2" NPT 2" NPT BY PASS
E 1" NPT 1" NPT 1" NPT 1" NPT 1" NPT 1" NPT 1" NPT CONDENSER LIQUID OUTLET
F 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE TEMP. CONTROLER SUPPLY
G 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE T.S.H. OUTPUT
H 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE FROM INSTUMENT GAS SUPPLY
I 1" NPT 1" NPT 1" NPT 1 1/2" NPT 1 1/2" NPT 1 1/2" NPT 1 1/2" NPT GLYCOL OUTLET
J 1" NPT 1" NPT 1" NPT 1 1/2" NPT 1 1/2" NPT 1 1/2" NPT 1 1/2" NPT GLYCOL INLET
K 1" NPT 1" NPT 1" NPT 1 1/2" NPT 1 1/2" NPT 1 1/2" NPT 1 1/2" NPT GLYCOL PSV
L 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE FROM INSTUMENT AIR SUPPLY
NOTES
CONNECTION SIZES MAY VARY ON MULTI CONDENSER UNITS
JATCO, INC.
ENVIRONMENTAL PROTECTION EQUIPMENT
P&ID
BTEX ELIMINATOR SHELL AND TUBE
2" CONTROLS
V-5000
SERVICE: LIQUID BLOWCASE
CONN:
LENGTH:
MATERIAL:
E-101
JATCO BTEX ELIMINATOR SYSTEM
SHELL AND TUBE GLYCOL CONDENSER
E-101
V-5000
LIQUID BLOWCASE
GLYCOL OUTLET
GLYCOL INLET
FROM MAIN SUPPLIER SUPPLY
SUPPLY GAS (DRY) 80-100 PSIG
SUPPLY GAS (DRY) 30 PSIG
FLAME ARRESTOR
MOUNT VERTICAL
GLOW PLUG
PILOT SUPPLY
MAIN FUEL GAS SUPPLY
SYSTEM BY-PASS
MIST ELIMINATOR PAD
GAS/LIQUID SEPARATOR
HIGH LEVEL SHUT DOWN
TO FLUSH TANK SEP.
TO STORAGE
FROM INSTRUMENT GAS SUPPLY 40-100 PSIG
FROM INSTR. AIR SUPPLY 80-100 PSIG
SHOP FIELD
VENT
NC
NO
C


BTEX ELIMINATOR SIZE
4-60 4-96 5-72 5-120
DIMENSION
A 4 1/2" 4 1/2" 6 1/2" 6 1/2"
B 33" 33" 31 1/2" 31 1/2"
C 42" 42" 43 1/2" 43 1/2"
D 64 1/2" 98 74" 95 1/2"
E 61 11/16" 97 11/16" 73 11/16" 121 11/16"
WT. 510# - - 975#
SCHEDULE OF OPENINGS
CONNECTION
SERVICE
4-60 4-96 5-72 5-120
A 2" NPT 3" NPT 4" NPT 4" NPT VAPOR INLET
B 1" NPT 1" NPT 1" NPT 1" NPT CONDENSATE OUTLET
C 1" NPT 1" NPT 1" NPT 2" NPT BTEX OUTLET
D 2" NPT 2" NPT 2" NPT 2" NPT BY PASS
E
F 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE TEMP. CONTROLER INPUT
G 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE T.S.H. OUTPUT
H 1/4" TUBE 1/4" TUBE 1/4" TUBE 1/4" TUBE FROM INSTUMENT GAS SUPPLY
I 1" NPT 1" NPT 1 1/2" NPT 1 1/2" NPT GLYCOL OUTLET
J 1" NPT 1" NPT 1 1/2" NPT 1 1/2" NPT GLYCOL INLET
JATCO, INC.
ENVIRONMENTAL PROTECTION EQUIPMENT
STOCK
TITLE BTEX SHELL AND TUBE 1" CONTROLS
SCALE: AS NOTED
DRAWING NUMBER 10212
SHEETS SHT# 1 OF 1
REV 0
ISOMETRIC VIEW
SCALE: NOT TO SCALE
PLAN VIEW
SCALE: 1 1/2" = 1'-0"
ELEVATION VIEW
SCALE: 1 1/2" = 1'-0"
VENT RISER

JATCO Shell & Tube
Steam to Liquid Heat Exchangers

Completely constructed with 304 stainless steel. Single pass tube construction. Available in 4” and 5” O.D. 304 stainless steel shell. Units can be configured in series to increase cooling capacity.

Specifications:

Test Pressure:	400 psi
Operating Pressure:	1 psi Shell (Vapor Side) / 150 psi Tube Sheet (Glycol Side)
Max Operating Temp:	225˚F
Min Operating Temp:	32˚F
Max Condenser Vapor Outlet Temp:	10˚ F Approach to Inlet Glycol of the Condenser
Shell:	Schedule 10 304 stainless steel pipe
Tubes:	½” Diameter .035 Wall 304 stainless steel
Tube Length:	60" - 120"

Model #	No. of Passes	Diameter	Tube Bundle Length	Cooling Surface
S.T 4-60	1	4"	60"	13.75 sq. ft.
S.T 4-72	1	4"	72"	16.50 sq. ft.
S.T. 4-96	1	4"	96"	22.00 sq. ft.
S.T. 5-60	1	5"	60"	25.54 sq. ft.
S.T. 5-72	1	5"	72"	30.65 sq. ft.
S.T. 5-96	1	5"	96"	40.80 sq. ft.
S.T. 5-120	1	5"	120"	51.00 sq. ft.

ATTACHMENT T

Emission Calculations

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Facility-Wide Emission Summary - Controlled

Wells	6	per pad
Storage Tanks	8	per pad
GPU Heaters	6	per pad
Line Heater	0	per pad
Heater Treater	2	per pad
Dehy Reboiler	1	per pad
Glycol Dehy	1	per pad
Compressor	3	per pad
High Pressure Separator	6	per pad
Low Pressure Separator	1	per pad
Vapor Recovery Unit	1	per pad
Enclosed Combustor	1	per pad
Length of lease road	2,500	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
C001	S001 - S004	Condensate Storage Vessels	---	---	---	---	8.30	36.34	---	---	---	---	---	---	0.02	0.09	0.49	2.15
C001	S005 - S008	Produced Water Storage Vessels	---	---	---	---	7.0E-04	3.1E-03	---	---	---	---	---	---	0.22	0.95	5.44	23.84
C001	S009	Controlled Liquid Loading - Produced Water	---	---	---	---	0.04	0.01	---	---	---	---	---	---	---	---	---	---
C001	S009	Controlled Liquid Loading - Condensate	---	---	---	---	0.81	3.54	---	---	---	---	---	---	---	---	---	---
E010	S010	GPU Heater - 2.0 MMBtu/hr	0.20	0.86	0.16	0.72	0.01	0.05	1.2E-03	0.01	0.01	0.07	0.01	0.07	4.4E-03	0.02	234.24	1025.95
E011	S011	GPU Heater - 2.0 MMBtu/hr	0.20	0.86	0.16	0.72	0.01	0.05	1.2E-03	0.01	0.01	0.07	0.01	0.07	4.4E-03	0.02	234.24	1025.95
E012	S012	GPU Heater - 2.0 MMBtu/hr	0.20	0.86	0.16	0.72	0.01	0.05	1.2E-03	0.01	0.01	0.07	0.01	0.07	4.4E-03	0.02	234.24	1025.95
E013	S013	GPU Heater - 2.0 MMBtu/hr	0.20	0.86	0.16	0.72	0.01	0.05	1.2E-03	0.01	0.01	0.07	0.01	0.07	4.4E-03	0.02	234.24	1025.95
E014	S014	GPU Heater - 2.0 MMBtu/hr	0.20	0.86	0.16	0.72	0.01	0.05	1.2E-03	0.01	0.01	0.07	0.01	0.07	4.4E-03	0.02	234.24	1025.95
E015	S015	GPU Heater - 2.0 MMBtu/hr	0.20	0.86	0.16	0.72	0.01	0.05	1.2E-03	0.01	0.01	0.07	0.01	0.07	4.4E-03	0.02	234.24	1025.95
E016	S016	Heater Treater - 1.0 MMBtu/hr	0.10	0.43	0.08	0.36	0.01	0.02	5.9E-04	2.6E-03	0.01	0.03	0.01	0.03	2.2E-03	0.01	117.12	512.98
E017	S017	Heater Treater - 1.0 MMBtu/hr	0.10	0.43	0.08	0.36	0.01	0.02	5.9E-04	2.6E-03	0.01	0.03	0.01	0.03	2.2E-03	0.01	117.12	512.98
E018	S018	Caterpillar 3516B LE	1.52	6.66	0.64	2.80	1.86	8.13	0.01	0.03	0.10	0.44	0.10	0.44	0.02	0.10	1443.31	6321.71
E019	S019	Caterpillar 3516B LE	1.52	6.66	0.64	2.80	1.86	8.13	0.01	0.03	0.10	0.44	0.10	0.44	0.02	0.10	1443.31	6321.71
E020	S020	Caterpillar 3306B TA	0.23	0.99	0.91	3.98	0.08	0.36	9.8E-04	4.3E-03	0.03	0.14	0.03	0.14	3.7E-03	0.02	233.64	1023.33
E021	S021	VRU Engine	0.06	0.25	0.12	0.51	0.08	0.35	3.3E-07	1.5E-06	1.1E-05	4.8E-05	1.1E-05	4.8E-05	1.2E-06	5.5E-06	0.07	0.29
E023	S022	Dehydration Unit - Still Vent	---	---	---	---	0.24	1.03	---	---	---	---	---	---	0.03	0.12	0.89	3.89
C001	S022	Dehydration Unit - Flash Tank	---	---	---	---	0.34	1.48	---	---	---	---	---	---	0.20	0.89	108.08	473.38
E023	S023	Reboiler - 0.75 MMBtu/hr	0.07	0.32	0.06	0.27	4.0E-03	0.02	4.4E-04	1.9E-03	0.01	0.02	0.01	0.02	1.7E-03	0.01	87.84	384.73
C001	C001	Enclosed Combustor	0.98	4.30	0.83	3.62	1.4E-04	6.0E-04	0.01	0.03	0.07	0.33	0.07	0.33	5.6E-05	2.4E-04	1173.60	5140.36
E009	S009	Uncaptured Liquid Loading - Produced Water	---	---	---	---	0.02	4.5E-03	---	---	---	---	---	---	---	---	---	---
E009	S009	Uncaptured Liquid Loading - Condensate	---	---	---	---	0.33	1.43	---	---	---	---	---	---	---	---	---	---
---	---	Fugitives	---	---	---	---	---	18.46	---	---	---	---	---	---	---	20.44	---	511.18
---	---	Blowdowns	---	---	---	---	---	4.12	---	---	---	---	---	---	---	7.42	---	185.51
---	---	Haul Roads	---	---	---	---	---	---	---	---	---	5.22	---	0.52	---	---	---	---
Facility Total			5.76	25.21	4.34	19.02	14.01	83.74	0.03	0.12	0.42	7.06	0.42	2.35	0.55	30.27	6136.32	27573.77
Facility Total (excluding fugitive emissions)			5.76	25.21	4.34	19.02	14.01	61.15	0.03	0.12	0.42	1.83	0.42	1.83	0.55	2.41	6136.32	26877.07

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley 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
C001	S001 - S004	Condensate Storage Vessels	---	---	3.7E-03	0.02	0.01	0.03	2.6E-03	0.01	0.01	0.03	0.27	1.17	0.02	0.09	0.29	1.26
C001	S005 - S008	Produced Water Storage Vessels	---	---	5.0E-05	2.2E-04	9.5E-05	4.1E-04	3.3E-05	1.4E-04	9.1E-05	4.0E-04	5.1E-07	2.2E-06	2.7E-04	1.2E-03	2.7E-04	1.2E-03
C001	S009	Controlled Liquid Loading - Produced Water	---	---	2.8E-03	8.1E-04	0.01	1.5E-03	1.9E-03	5.3E-04	0.01	1.5E-03	2.9E-05	8.3E-06	0.02	4.3E-03	0.02	4.3E-03
C001	S009	Controlled Liquid Loading - Condensate	---	---	2.1E-04	9.3E-04	3.9E-04	1.7E-03	1.6E-04	6.9E-04	4.1E-04	1.8E-03	0.02	0.10	1.2E-03	0.01	0.02	0.11
E010	S010	GPU Heater - 2.0 MMBtu/hr	1.5E-04	6.4E-04	4.1E-06	1.8E-05	6.7E-06	2.9E-05	---	---	---	---	3.5E-03	0.02	1.1E-05	4.7E-05	3.7E-03	0.02
E011	S011	GPU Heater - 2.0 MMBtu/hr	1.5E-04	6.4E-04	4.1E-06	1.8E-05	6.7E-06	2.9E-05	---	---	---	---	3.5E-03	0.02	1.1E-05	4.7E-05	3.7E-03	0.02
E012	S012	GPU Heater - 2.0 MMBtu/hr	1.5E-04	6.4E-04	4.1E-06	1.8E-05	6.7E-06	2.9E-05	---	---	---	---	3.5E-03	0.02	1.1E-05	4.7E-05	3.7E-03	0.02
E013	S013	GPU Heater - 2.0 MMBtu/hr	1.5E-04	6.4E-04	4.1E-06	1.8E-05	6.7E-06	2.9E-05	---	---	---	---	3.5E-03	0.02	1.1E-05	4.7E-05	3.7E-03	0.02
E014	S014	GPU Heater - 2.0 MMBtu/hr	1.5E-04	6.4E-04	4.1E-06	1.8E-05	6.7E-06	2.9E-05	---	---	---	---	3.5E-03	0.02	1.1E-05	4.7E-05	3.7E-03	0.02
E015	S015	GPU Heater - 2.0 MMBtu/hr	1.5E-04	6.4E-04	4.1E-06	1.8E-05	6.7E-06	2.9E-05	---	---	---	---	3.5E-03	0.02	1.1E-05	4.7E-05	3.7E-03	0.02
E016	S016	Heater Treater - 1.0 MMBtu/hr	7.4E-05	3.2E-04	2.1E-06	9.0E-06	3.3E-06	1.5E-05	---	---	---	---	1.8E-03	0.01	5.4E-06	2.4E-05	1.9E-03	0.01
E017	S017	Heater Treater - 1.0 MMBtu/hr	7.4E-05	3.2E-04	2.1E-06	9.0E-06	3.3E-06	1.5E-05	---	---	---	---	1.8E-03	0.01	5.4E-06	2.4E-05	1.9E-03	0.01
E018	S018	Caterpillar 3516B LE	0.30	1.33	4.4E-03	0.02	4.1E-03	0.02	4.0E-04	1.8E-03	1.9E-03	0.01	---	---	0.01	0.05	0.50	2.19
E019	S019	Caterpillar 3516B LE	0.30	1.33	4.4E-03	0.02	4.1E-03	0.02	4.0E-04	1.8E-03	1.9E-03	0.01	---	---	0.01	0.05	0.50	2.19
E020	S020	Caterpillar 3306B TA	0.03	0.12	2.6E-03	0.01	9.3E-04	4.1E-03	4.1E-05	1.8E-04	3.2E-04	1.4E-03	---	---	3.9E-03	0.02	0.05	0.21
E021	S021	VRU Engine	1.2E-05	5.1E-05	8.9E-07	3.9E-06	3.2E-07	1.4E-06	1.4E-08	6.1E-08	1.1E-07	4.8E-07	---	---	1.3E-06	5.8E-06	1.8E-05	8.0E-05
E023	S022	Dehydration Unit - Still Vent	---	---	2.2E-03	0.01	1.0E-03	4.4E-03	1.0E-04	3.0E-04	1.0E-04	6.0E-04	2.4E-03	0.01	3.4E-03	0.01	0.01	0.03
C001	S022	Dehydration Unit - Flash Tank	---	---	5.0E-04	2.0E-03	6.0E-04	2.5E-03	1.0E-04	4.0E-04	2.0E-04	8.0E-04	0.01	0.03	1.4E-03	0.01	0.01	0.04
E023	S023	Reboiler - 0.75 MMBtu/hr	5.5E-05	2.4E-04	1.5E-06	6.8E-06	2.5E-06	1.1E-05	---	---	---	---	1.3E-03	0.01	4.0E-06	1.8E-05	1.4E-03	0.01
C001	C001	Enclosed Combustor	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
E009	S009	Uncaptured Liquid Loading - Produced Water	---	---	1.1E-03	3.3E-04	2.2E-03	6.1E-04	7.5E-04	2.1E-04	2.1E-03	5.9E-04	1.2E-05	3.3E-06	0.01	1.7E-03	0.01	1.7E-03
E009	S009	Uncaptured Liquid Loading - Condensate	---	---	8.6E-05	3.8E-04	1.6E-04	6.9E-04	6.4E-05	2.8E-04	1.6E-04	7.2E-04	0.01	0.04	4.7E-04	2.1E-03	0.01	0.04
---	---	Fugitives	---	---	---	0.01	---	0.01	---	0.01	---	0.01	---	0.39	---	0.04	---	0.42
---	---	Blowdowns	---	---	---	1.2E-03	---	2.7E-03	---	1.2E-03	---	3.1E-03	---	0.09	---	0.01	---	0.09
---	---	Haul Roads	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Facility Total			0.64	2.79	0.02	0.09	0.03	0.10	0.01	0.02	0.02	0.07	0.34	1.95	0.07	0.28	1.43	6.70
Facility Total (excluding fugitive emissions)			0.64	2.79	0.02	0.08	0.03	0.08	0.01	0.02	0.02	0.05	0.34	1.47	0.07	0.23	1.43	6.18

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Condensate Storage Vessels

Emission Source ID S001 - S004
Operational Hours 8,760 hrs/yr
Maximum Condensate Throughput[1] 1,658 bbl/day

Overall Control Efficiency of Enclosed Combustor 98%

Condensate Storage Tank Emissions - Uncontrolled

	Working & Breathing		Flashing		Total Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Methane	<0.001	<0.001	0.981	4.295	0.981	4.295
Ethane	<0.001	<0.001	19.067	83.513	19.067	83.513
Propane	4.003	17.532	98.014	429.300	102.016	446.832
i-Butane	1.349	5.910	36.164	158.400	37.514	164.310
n-Butane	4.635	20.300	120.205	526.500	124.840	546.800
2,2-Dimethylpropane	0.060	0.262	1.726	7.559	1.786	7.821
i-Pentane	1.411	6.180	40.137	175.800	41.548	181.980
n-Pentane	1.863	8.159	53.790	235.600	55.653	243.759
2,2-Dimethylbutane	0.028	0.122	0.813	3.563	0.841	3.685
Cyclopentane	0.001	0.005	0.036	0.157	0.037	0.161
2,3-Dimethylbutane	0.046	0.201	1.344	5.887	1.390	6.088
2-Methylpentane	0.289	1.267	8.772	38.420	9.061	39.687
3-Methylpentane	0.175	0.767	5.146	22.540	5.321	23.307
n-Hexane	0.437	1.915	12.945	56.700	13.382	58.615
Methylcyclopentane	0.046	0.203	1.492	6.535	1.538	6.738
Benzene	0.004	0.017	0.180	0.790	0.184	0.807
Cyclohexane	0.040	0.174	1.466	6.421	1.506	6.595
2-Methylhexane	0.028	0.123	2.982	13.060	3.010	13.183
3-Methylhexane	0.078	0.342	2.368	10.370	2.446	10.712
2,2,4-Trimethylpentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Heptane	0.115	0.503	3.621	15.860	3.736	16.363
Methylcyclohexane	0.058	0.256	1.757	7.695	1.815	7.951
Toluene	0.007	0.032	0.331	1.451	0.338	1.483
Octane	0.025	0.110	0.843	3.692	0.868	3.802
Ethylbenzene	0.003	0.013	0.127	0.555	0.130	0.568
m-Xylene	0.004	0.017	0.133	0.583	0.137	0.600
o-Xylene	0.004	0.015	0.180	0.790	0.184	0.805
n-Nonane	0.005	0.022	0.172	0.755	0.177	0.776
n-Decane	0.001	0.004	0.038	0.168	0.039	0.172
TEG	1.1E-14	4.7E-14	3.1E-10	1.4E-09	3.1E-10	1.4E-09
Other C-7's	0.034	0.151	1.084	4.747	1.118	4.898
Other C-8's	0.091	0.397	3.032	13.280	3.123	13.677
Other C-9's	0.020	0.086	0.702	3.073	0.721	3.159
Other C-10's	0.007	0.030	0.266	1.165	0.273	1.195
Undecanes Plus	0.002	0.007	0.068	0.297	0.069	0.304
Total VOC Emissions:	14.87	65.12	399.93	1751.71	414.80	1816.83
Total HAP Emissions:	4.6E-01	2.01	13.90	60.87	14.36	62.88

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Condensate Storage Vessels

Emission Source ID S001 - S004
Operational Hours 8,760 hrs/yr
Maximum Condensate Throughput[1] 1,658 bbl/day

Overall Control Efficiency of Enclosed Combustor 98%

Condensate Storage Tank Emissions - Controlled [2]

	Working & Breathing		Flashing		Total Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Methane	<0.001	<0.001	0.020	0.086	0.020	0.086
Ethane	<0.001	<0.001	0.381	1.670	0.381	1.670
Propane	0.080	0.351	1.960	8.586	2.040	8.937
i-Butane	0.027	0.118	0.723	3.168	0.750	3.286
n-Butane	0.093	0.406	2.404	10.530	2.497	10.936
2,2-Dimethylpropane	0.001	0.005	0.035	0.151	0.036	0.156
i-Pentane	0.028	0.124	0.803	3.516	0.831	3.640
n-Pentane	0.037	0.163	1.076	4.712	1.113	4.875
2,2-Dimethylbutane	0.001	0.002	0.016	0.071	0.017	0.074
Cyclopentane	2.1E-05	9.1E-05	0.001	0.003	0.001	0.003
2,3-Dimethylbutane	0.001	0.004	0.027	0.118	0.028	0.122
2-Methylpentane	0.006	0.025	0.175	0.768	0.181	0.794
3-Methylpentane	0.004	0.015	0.103	0.451	0.106	0.466
n-Hexane	0.009	0.038	0.259	1.134	0.268	1.172
Methylcyclopentane	0.001	0.004	0.030	0.131	0.031	0.135
Benzene	7.8E-05	3.4E-04	0.004	0.016	0.004	0.016
Cyclohexane	0.001	0.003	0.029	0.128	0.030	0.132
2-Methylhexane	0.001	0.002	0.060	0.261	0.060	0.264
3-Methylhexane	0.002	0.007	0.047	0.207	0.049	0.214
2,2,4-Trimethylpentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Heptane	0.002	0.010	0.072	0.317	0.075	0.327
Methylcyclohexane	0.001	0.005	0.035	0.154	0.036	0.159
Toluene	1.4E-04	0.001	0.007	0.029	0.007	0.030
Octane	0.001	0.002	0.017	0.074	0.017	0.076
Ethylbenzene	5.8E-05	2.5E-04	0.003	0.011	0.003	0.011
m-Xylene	8.0E-05	3.5E-04	0.003	0.012	0.003	0.012
o-Xylene	7.0E-05	3.1E-04	0.004	0.016	0.004	0.016
n-Nonane	9.9E-05	4.3E-04	0.003	0.015	0.004	0.016
n-Decane	2.0E-05	8.7E-05	0.001	0.003	0.001	0.003
TEG	2.1E-16	9.4E-16	6.3E-12	2.8E-11	6.3E-12	2.8E-11
Other C-7's	0.001	0.003	0.022	0.095	0.022	0.098
Other C-8's	0.002	0.008	0.061	0.266	0.062	0.274
Other C-9's	3.9E-04	0.002	0.014	0.061	0.014	0.063
Other C-10's	1.4E-04	0.001	0.005	0.023	0.005	0.024
Undecanes Plus	3.2E-05	1.4E-04	0.001	0.006	0.001	0.006
Total VOC Emissions:	0.30	1.30	8.00	35.03	8.30	36.34
Total HAP Emissions:	0.01	0.04	0.28	1.22	0.29	1.26

Notes:

1. Uncontrolled emissions calculated using the Promax tank emissions stencil. Methane and ethane emissions were obtained from the tank vapor stream.
2. Emissons from the condensate storage tanks will be primarily controlled by the enclosed combustor.

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Produce Water Storage Vessels

Emission Source ID S005 - S008
Operational Hours 8,760 hrs/yr
Maximum Produced Water Throughput[1] 2,181 bbl/day

Overall Control Efficiency of Enclosed Combustor 98%

Produced Water Storage Tanks - Uncontrolled

	Working & Breathing		Flashing		Total Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Methane	10.888	47.690	---	---	10.888	47.690
Ethane	3.355	14.695	---	---	3.355	14.695
Propane	0.012	0.051	---	---	0.012	0.051
i-Butane	0.001	0.003	---	---	0.001	0.003
n-Butane	0.005	0.022	---	---	0.005	0.022
2,2-Dimethylpropane	1.0E-05	4.5E-05	---	---	1.0E-05	4.5E-05
i-Pentane	4.9E-04	0.002	---	---	4.9E-04	0.002
n-Pentane	1.6E-04	0.001	---	---	1.6E-04	0.001
2,2-Dimethylbutane	1.3E-06	5.5E-06	---	---	1.3E-06	5.5E-06
Cyclopentane	1.1E-05	4.7E-05	---	---	1.1E-05	4.7E-05
2,3-Dimethylbutane	1.0E-05	4.4E-05	---	---	1.0E-05	4.4E-05
2-Methylpentane	2.8E-05	1.2E-04	---	---	2.8E-05	1.2E-04
3-Methylpentane	1.1E-04	4.8E-04	---	---	1.1E-04	4.8E-04
n-Hexane	2.6E-05	1.1E-04	---	---	2.6E-05	1.1E-04
Methylcyclopentane	1.1E-04	4.9E-04	---	---	1.1E-04	4.9E-04
Benzene	0.003	0.011	---	---	0.003	0.011
Cyclohexane	4.5E-04	0.002	---	---	4.5E-04	0.002
2-Methylhexane	5.0E-06	2.2E-05	---	---	5.0E-06	2.2E-05
3-Methylhexane	5.4E-06	2.3E-05	---	---	5.4E-06	2.3E-05
2,2,4-Trimethylpentane	<0.001	<0.001	---	---	<0.001	<0.001
Heptane	3.6E-06	1.6E-05	---	---	3.6E-06	1.6E-05
Methylcyclohexane	1.2E-04	0.001	---	---	1.2E-04	0.001
Toluene	0.005	0.021	---	---	0.005	0.021
Octane	1.3E-07	5.6E-07	---	---	1.3E-07	5.6E-07
Ethylbenzene	0.002	0.007	---	---	0.002	0.007
m-Xylene	0.002	0.008	---	---	0.002	0.008
o-Xylene	0.003	0.012	---	---	0.003	0.012
n-Nonane	1.9E-08	8.3E-08	---	---	1.9E-08	8.3E-08
n-Decane	4.4E-10	1.9E-09	---	---	4.4E-10	1.9E-09
Other C-7's	7.9E-05	3.5E-04	---	---	7.9E-05	3.5E-04
Other C-8's	0.001	0.003	---	---	0.001	0.003
Other C-9's	0.001	0.003	---	---	0.001	0.003
Other C-10's	0.001	0.004	---	---	0.001	0.004
Undecanes Plus	3.9E-04	0.002	---	---	3.9E-04	0.002
Total VOC Emissions:	3.5E-02	1.5E-01	---	---	3.5E-02	1.5E-01
Total HAP Emissions:	1.3E-02	5.9E-02	---	---	1.3E-02	5.9E-02

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Produce Water Storage Vessels

Emission Source ID S005 - S008
Operational Hours 8,760 hrs/yr
Maximum Produced Water Throughput[1] 2,181 bbl/day

Overall Control Efficiency of Enclosed Combustor 98%

Produced Water Storage Tank Emissions - Controlled [2]

	Working & Breathing		Flashing		Total Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Methane	0.218	0.954	---	---	0.218	0.954
Ethane	0.067	0.294	---	---	0.067	0.294
Propane	2.3E-04	0.001	---	---	2.3E-04	0.001
i-Butane	1.6E-05	6.8E-05	---	---	1.6E-05	6.8E-05
n-Butane	9.9E-05	4.4E-04	---	---	9.9E-05	4.4E-04
2,2-Dimethylpropane	2.0E-07	8.9E-07	---	---	2.0E-07	8.9E-07
i-Pentane	9.7E-06	4.3E-05	---	---	9.7E-06	4.3E-05
n-Pentane	3.1E-06	1.4E-05	---	---	3.1E-06	1.4E-05
2,2-Dimethylbutane	2.5E-08	1.1E-07	---	---	2.5E-08	1.1E-07
Cyclopentane	2.1E-07	9.3E-07	---	---	2.1E-07	9.3E-07
2,3-Dimethylbutane	2.0E-07	8.8E-07	---	---	2.0E-07	8.8E-07
2-Methylpentane	5.6E-07	2.4E-06	---	---	5.6E-07	2.4E-06
3-Methylpentane	2.2E-06	9.6E-06	---	---	2.2E-06	9.6E-06
n-Hexane	5.1E-07	2.2E-06	---	---	5.1E-07	2.2E-06
Methylcyclopentane	2.2E-06	9.8E-06	---	---	2.2E-06	9.8E-06
Benzene	5.0E-05	2.2E-04	---	---	5.0E-05	2.2E-04
Cyclohexane	9.0E-06	3.9E-05	---	---	9.0E-06	3.9E-05
2-Methylhexane	1.0E-07	4.4E-07	---	---	1.0E-07	4.4E-07
3-Methylhexane	1.1E-07	4.7E-07	---	---	1.1E-07	4.7E-07
2,2,4-Trimethylpentane	<0.001	<0.001	---	---	<0.001	<0.001
Heptane	7.1E-08	3.1E-07	---	---	7.1E-08	3.1E-07
Methylcyclohexane	2.3E-06	1.0E-05	---	---	2.3E-06	1.0E-05
Toluene	9.5E-05	4.1E-04	---	---	9.5E-05	4.1E-04
Octane	2.5E-09	1.1E-08	---	---	2.5E-09	1.1E-08
Ethylbenzene	3.3E-05	1.4E-04	---	---	3.3E-05	1.4E-04
m-Xylene	3.8E-05	1.7E-04	---	---	3.8E-05	1.7E-04
o-Xylene	5.3E-05	2.3E-04	---	---	5.3E-05	2.3E-04
n-Nonane	3.8E-10	1.7E-09	---	---	3.8E-10	1.7E-09
n-Decane	8.7E-12	3.8E-11	---	---	8.7E-12	3.8E-11
Other C-7's	1.6E-06	6.9E-06	---	---	1.6E-06	6.9E-06
Other C-8's	1.3E-05	5.9E-05	---	---	1.3E-05	5.9E-05
Other C-9's	1.3E-05	5.8E-05	---	---	1.3E-05	5.8E-05
Other C-10's	1.7E-05	7.3E-05	---	---	1.7E-05	7.3E-05
Undecanes Plus	7.7E-06	3.4E-05	---	---	7.7E-06	3.4E-05
Total VOC Emissions:	7.0E-04	3.1E-03	---	---	7.0E-04	3.1E-03
Total HAP Emissions:	2.7E-04	1.2E-03	---	---	2.7E-04	1.2E-03

Notes:

1. Uncontrolled emissions calculated using the Promax tank emissions stencil. Methane and ethane emissions were obtained from the tank vapor stream.
2. Emissons from the condensate storage tanks will be primarily controlled by the enclosed combustor.

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Condensate Liquid Loading

Emission Source ID S009
Throughput [1] 25,423,272 gal/yr
Capture Efficiency 99.2% MACT-level annual leak testing (AP-42 Section 5.2.1)
Control Efficiency 98% Combustor destruction efficiency

Liquid Loading Emissions [2]

	Uncontrolled Emissions		Uncaptured Emissions		Controlled Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Propane	10.950	47.980	0.088	0.384	0.217	0.952
i-Butane	3.692	16.170	0.030	0.129	0.073	0.321
n-Butane	12.680	55.550	0.101	0.444	0.252	1.102
2,2-Dimethylpropane	0.164	0.718	0.001	0.006	0.003	0.014
i-Pentane	3.861	16.910	0.031	0.135	0.077	0.335
n-Pentane	5.097	22.330	0.041	0.179	0.101	0.443
2,2-Dimethylbutane	0.076	0.334	0.001	0.003	0.002	0.007
Cyclopentane	0.002	0.012	1.83E-05	9.93E-05	4.53E-05	2.46E-04
2,3-Dimethylbutane	0.126	0.551	0.001	0.004	0.002	0.011
2-Methylpentane	0.791	3.466	0.006	0.028	0.016	0.069
3-Methylpentane	0.479	2.100	0.004	0.017	0.010	0.042
n-Hexane	1.197	5.241	0.010	0.042	0.024	0.104
Methylcyclopentane	0.127	0.555	0.001	0.004	0.003	0.011
Benzene	0.011	0.047	8.58E-05	3.76E-04	2.13E-04	0.001
Cyclohexane	0.109	0.477	0.001	0.004	0.002	0.009
2-Methylhexane	0.077	0.336	0.001	0.003	0.002	0.007
3-Methylhexane	0.214	0.935	0.002	0.007	0.004	0.019
2,2,4-Trimethylpentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Heptane	0.314	1.377	0.003	0.011	0.006	0.027
Methylcyclohexane	0.160	0.700	0.001	0.006	0.003	0.014
Toluene	0.020	0.086	1.58E-04	0.001	3.91E-04	0.002
Octane	0.069	0.301	0.001	0.002	0.001	0.006
Ethylbenzene	0.008	0.035	6.36E-05	2.79E-04	1.58E-04	0.001
m-Xylene	0.011	0.048	8.72E-05	3.82E-04	2.16E-04	0.001
o-Xylene	0.010	0.042	7.69E-05	3.37E-04	1.91E-04	0.001
n-Nonane	0.014	0.059	1.08E-04	4.74E-04	2.68E-04	0.001
n-Decane	0.003	0.012	2.17E-05	9.52E-05	5.39E-05	2.36E-04
TEG	2.93E-14	1.29E-13	2.35E-16	1.03E-15	5.82E-16	2.55E-15
Other C-7's	0.094	0.412	0.001	0.003	0.002	0.008
Other C-8's	0.248	1.088	0.002	0.009	0.005	0.022
Other C-9's	0.054	0.235	4.29E-04	0.002	0.001	0.005
Other C-10's	0.019	0.083	1.52E-04	0.001	3.77E-04	0.002
Undecanes Plus	0.004	0.019	3.52E-05	1.54E-04	8.72E-05	3.82E-04
Total VOC Emissions:	40.68	178.21	0.33	1.43	0.81	3.54
Total HAP Emissions:	1.26	5.50	0.01	0.04	0.02	0.11

Notes:
1. Liquid loading throughput is based on the condensate loading throughput at the wellpad.
2. Uncontrolled emissions calculation using Promax.

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Produced Water Liquid Loading

Emission Source ID S009
Throughput [1] 33,434,730 gal/yr
Capture Efficiency 99.2% MACT-level annual leak testing (AP-42 Section 5.2.1)
Control Efficiency 98% Combustor destruction efficiency

Liquid Loading Emissions [2]

	Uncontrolled Emissions		Uncaptured Emissions		Controlled Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Propane	0.661	0.188	0.005	0.002	0.013	0.004
i-Butane	0.044	0.013	3.56E-04	1.01E-04	0.001	2.51E-04
n-Butane	0.283	0.081	0.002	0.001	0.006	0.002
2,2-Dimethylpropane	0.001	1.65E-04	4.63E-06	1.32E-06	1.15E-05	3.27E-06
i-Pentane	0.028	0.008	2.22E-04	6.31E-05	0.001	1.56E-04
n-Pentane	0.009	0.003	7.11E-05	2.02E-05	1.76E-04	5.01E-05
2,2-Dimethylbutane	7.18E-05	2.04E-05	5.75E-07	1.63E-07	1.43E-06	4.05E-07
Cyclopentane	0.001	1.73E-04	4.86E-06	1.38E-06	1.20E-05	3.43E-06
2,3-Dimethylbutane	0.001	1.63E-04	4.58E-06	1.30E-06	1.14E-05	3.23E-06
2-Methylpentane	0.002	4.50E-04	1.27E-05	3.60E-06	3.14E-05	8.93E-06
3-Methylpentane	0.006	0.002	5.02E-05	1.43E-05	1.25E-04	3.54E-05
n-Hexane	0.001	4.16E-04	1.17E-05	3.33E-06	2.90E-05	8.25E-06
Methylcyclopentane	0.006	0.002	5.10E-05	1.45E-05	1.26E-04	3.60E-05
Benzene	0.143	0.041	0.001	3.26E-04	0.003	0.001
Cyclohexane	0.026	0.007	2.04E-04	5.81E-05	0.001	1.44E-04
2-Methylhexane	2.84E-04	8.07E-05	2.27E-06	6.45E-07	5.63E-06	1.60E-06
3-Methylhexane	3.05E-04	8.68E-05	2.44E-06	6.94E-07	6.06E-06	1.72E-06
2,2,4-Trimethylpentane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Heptane	2.03E-04	5.77E-05	1.62E-06	4.62E-07	4.03E-06	1.15E-06
Methylcyclohexane	0.007	0.002	5.26E-05	1.49E-05	1.30E-04	3.71E-05
Toluene	0.269	0.077	0.002	0.001	0.005	0.002
Octane	7.24E-06	2.06E-06	5.79E-08	1.65E-08	1.44E-07	4.08E-08
Ethylbenzene	0.093	0.027	0.001	2.13E-04	0.002	0.001
m-Xylene	0.108	0.031	0.001	2.46E-04	0.002	0.001
o-Xylene	0.151	0.043	0.001	3.43E-04	0.003	0.001
n-Nonane	1.08E-06	3.07E-07	8.63E-09	2.45E-09	2.14E-08	6.08E-09
n-Decane	2.49E-08	7.07E-09	1.99E-10	5.65E-11	4.93E-10	1.40E-10
TEG	9.77E-14	2.78E-14	7.81E-16	2.22E-16	1.94E-15	5.51E-16
Other C-7's	0.004	0.001	3.60E-05	1.02E-05	8.92E-05	2.54E-05
Other C-8's	0.038	0.011	3.06E-04	8.71E-05	0.001	2.16E-04
Other C-9's	0.038	0.011	3.01E-04	8.56E-05	0.001	2.12E-04
Other C-10's	0.047	0.013	3.79E-04	1.08E-04	0.001	2.67E-04
Undecanes Plus	0.022	0.006	1.77E-04	5.02E-05	4.38E-04	1.25E-04
Total VOC Emissions:	1.99E+00	5.66E-01	1.59E-02	4.53E-03	3.95E-02	1.12E-02
Total HAP Emissions:	7.66E-01	2.18E-01	6.13E-03	1.74E-03	1.52E-02	4.32E-03

Notes:
1. Liquid loading throughput is based on the condensate loading throughput at the wellpad.
2. Uncontrolled emissions calculation using Promax.

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

GPU Heaters

Emission Source ID:	**S010 - S015**
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,267
Heat Input (MMBtu/hr)	2.00
Fuel Consumption (MMscf/hr):	1.58E-03
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor [1, 2]	Emission Factor Unit of Measure	Potential Emissions	
			(lb/hr)[3, 4]	(tons/yr)[5]
NO_X	100	lb/MMscf	0.20	0.86
CO	84	lb/MMscf	0.16	0.72
VOC	5.5	lb/MMscf	0.01	0.05
SO_2	0.6	lb/MMscf	1.2E-03	5.2E-03
PM Total	7.6	lb/MMscf	0.01	0.07
PM Condensable	5.7	lb/MMscf	0.01	0.05
PM_{10} (Filterable)	1.9	lb/MMscf	3.7E-03	0.02
$PM_{2.5}$ (Filterable)	1.9	lb/MMscf	3.7E-03	0.02
Lead	5.00E-04	lb/MMscf	9.8E-07	4.3E-06
CO_2	117.0	lb/MMBtu	233.99	1024.90
CH_4	2.21E-03	lb/MMBtu	4.4E-03	1.9E-02
N_2O	2.21E-04	lb/MMBtu	4.4E-04	1.9E-03
Total HAP	1.89	lb/MMscf	3.7E-03	0.02

Notes:

1. Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3
2. GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.
3. Emission Rate (lb/hr) = Emission Factor (lb/MMscf) / 1,020 (Btu/scf) x Rated Capacity (MMBtu/hr)
4. Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) x Rated Capacity (MMBtu/hr)
5. Emission Rate (tons/yr) = Emissions (lb/hr) x Operating hours (hrs/yr) / 2,000 (lb/ton)

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Heater Treaters

Emission Unit ID:	**S016 - S017**
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,267
Heat Input (MMBtu/hr)	1.00
Fuel Consumption (MMscf/hr):	7.89E-04
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor [1, 2]	Emission Factor Unit of Measure	Potential Emissions	
			(lb/hr)[3, 4]	(tons/yr)[5]
NO_x	100	lb/MMscf	0.10	0.43
CO	84	lb/MMscf	0.08	0.36
VOC	5.5	lb/MMscf	0.01	0.02
SO_2	0.6	lb/MMscf	5.9E-04	2.6E-03
PM Total	7.6	lb/MMscf	0.01	0.03
PM Condensable	5.7	lb/MMscf	0.01	0.02
PM_{10} (Filterable)	1.9	lb/MMscf	1.9E-03	0.01
$PM_{2.5}$ (Filterable)	1.9	lb/MMscf	1.9E-03	0.01
Lead	5.00E-04	lb/MMscf	4.9E-07	2.1E-06
CO_2	117.0	lb/MMBtu	117.00	512.45
CH_4	2.21E-03	lb/MMBtu	2.2E-03	9.7E-03
N_2O	2.21E-04	lb/MMBtu	2.2E-04	9.7E-04
Total HAP	1.89	lb/MMscf	1.85E-03	0.01

Notes:

1. Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3
2. GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.
3. Emission Rate (lb/hr) = Emission Factor (lb/MMscf) / 1,020 (Btu/scf) x Rated Capacity (MMBtu/hr)
4. Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) x Rated Capacity (MMBtu/hr)
5. Emission Rate (tons/yr) = Emissions (lb/hr) x Operating hours (hrs/yr) / 2,000 (lb/ton)

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Compressor Engine

Engine Information:

Manufacturer:	Caterpillar
Model No.:	3516B LE
Emission Source ID:	S018 - S019
Stroke Cycle:	4-Stroke
Type of Burn:	Lean Burn
Rated Horsepower (bhp):	1,380

Engine Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,267
Specific Fuel Consumption (Btu/bhp-hr):	7,301
Maximum Fuel Consumption at 100% Load (scf/hr):	7,951.63
Heat Input (MMBtu/hr):	10.08
Potential Fuel Consumption (MMBtu/yr):	88,260
Max. Fuel Consumption at 100%(MMscf/hr):	0.0080
Max. Fuel Consumption (MMscf/yr):	69.7
Max. Annual Hours of Operation (hr/yr):	8,760

Engine Emissions Data:

Pollutant [1, 2, 3]	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr [4, 5]	tpy [7]	
NO_X	0.50	g/bhp-hr	1.52	6.66	Manufacturer's Specifications
VOC (excludes HCHO)	0.51	g/bhp-hr	1.55	6.80	Manufacturer's Specifications
VOC (includes HCHO)	---	---	1.86	8.13	VOC + HCHO
CO	0.21	g/bhp-hr	0.64	2.80	Manufacturer's Specifications
SO_X	0.001	lb/MMBtu	<0.01	<0.01	AP-42, Table 3.2-2 (Aug-2000)
PM_{10}	0.01	lb/MMBtu	0.10	0.44	AP-42, Table 3.2-2 (Aug-2000)
$PM_{2.5}$	0.01	lb/MMBtu	0.10	0.44	AP-42, Table 3.2-2 (Aug-2000)
Formaldehyde (HCHO)	0.10	g/bhp-hr	0.30	1.33	Manufacturer's Specifications
GHG (CO_2e)	See Table Below		1,443	6,322	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	0.12	lb/MMBtu	0.50	2.19	AP-42, Table 3.2-2 (Aug-2000)

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Compressor Engine

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr [4, 6]	tpy [7]	
GHGs:					
CO_2	474	g/bhp-hr	1442.10	6316.38	Manufacturer's Specifications
CH_4	0.001	kg/MMBtu	2.2E-02	9.7E-02	40 CFR 98, Table C-2
N_2O	0.0001	kg/MMBtu	2.2E-03	9.7E-03	40 CFR 98, Table C-2
GHG (CO_2e)			**1,443**	**6,322**	

Notes:

1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type.
4. Emission Rate (lb/hr) = Emission Factor (g/bhp-hr) x Engine Rating (hp) / 453.59 (g/lb)
5. Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) x Engine Rating (MMBtu/hr)
6. Emission Rate (lb/hr) = Emission Factor (kg/MMBtu) x Engine Rating (MMBtu/hr) x 2.205 (lb/kg)
7. Emission Rate (tpy) = Emission Rate (lb/hr) x Hours of Operation (hr/yr) / 2,000 (lb/ton)

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Compressor Engine

Engine Information:

Manufacturer:	Caterpillar
Model No.:	3306B TA
Emission Source ID:	S020
Stroke Cycle:	4-Stroke
Type of Burn:	Rich Burn
Rated Horsepower (bhp):	206

Engine Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,267
Specific Fuel Consumption (Btu/bhp-hr):	8,066
Maximum Fuel Consumption at 100% Load (scf/hr):	1,311.35
Heat Input (MMBtu/hr):	1.66
Potential Fuel Consumption (MMBtu/yr):	14,556
Max. Fuel Consumption at 100%(MMscf/hr):	0.0013
Max. Fuel Consumption (MMscf/yr):	11.5
Max. Annual Hours of Operation (hr/yr):	8,760

Engine Emissions Data:

Pollutant [1, 2, 3]	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr [4, 5]	tpy [7]	
NO_X	0.50	g/bhp-hr	0.23	0.99	Manufacturer's Specifications
VOC (excludes HCHO)	0.12	g/bhp-hr	0.05	0.24	Manufacturer's Specifications
VOC (includes HCHO)	---	---	0.08	0.36	VOC + HCHO
CO	2.00	g/bhp-hr	0.91	3.98	Manufacturer's Specifications
SO_X	0.001	lb/MMBtu	<0.01	<0.01	AP-42, Table 3.2-3 (Aug-2000)
PM_{10}	0.02	lb/MMBtu	0.03	0.14	AP-42, Table 3.2-3 (Aug-2000)
$PM_{2.5}$	0.02	lb/MMBtu	0.03	0.14	AP-42, Table 3.2-3 (Aug-2000)
Formaldehyde (HCHO)	0.06	g/bhp-hr	0.03	0.12	Manufacturer's Specifications
GHG (CO_2e)	See Table Below		234	1,023	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	0.07	lb/MMBtu	0.05	0.21	AP-42, Table 3.2-3 (Aug-2000)

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Compressor Engine

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr [4, 6]	tpy [7]	
GHGs:					
CO_2	514	g/bhp-hr	233.44	1022.45	Manufacturer's Specifications
CH_4	0.001	kg/MMBtu	3.7E-03	1.6E-02	40 CFR 98, Table C-2
N_2O	0.0001	kg/MMBtu	3.7E-04	1.6E-03	40 CFR 98, Table C-2
GHG (CO_2e)			**234**	**1,023**	

Notes:

1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type.
4. Emission Rate (lb/hr) = Emission Factor (g/bhp-hr) x Engine Rating (hp) / 453.59 (g/lb)
5. Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) x Engine Rating (MMBtu/hr)
6. Emission Rate (lb/hr) = Emission Factor (kg/MMBtu) x Engine Rating (MMBtu/hr) x 2.205 (lb/kg)
7. Emission Rate (tpy) = Emission Rate (lb/hr) x Hours of Operation (hr/yr) / 2,000 (lb/ton)

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

VRU Engine

Engine Information:

Manufacturer:	CSI Compressco
Model No.:	GasJack GJ230
Emission Source ID:	S021
Stroke Cycle:	4-Stroke
Type of Burn:	Rich Burn
Rated Horsepower (bhp):	52.4

Engine Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,267
Specific Fuel Consumption (Btu/bhp-hr):	10.8
Maximum Fuel Consumption at 100% Load (scf/hr):	0.45
Heat Input (MMBtu/hr):	5.65E-04
Potential Fuel Consumption (MMBtu/yr):	5
Max. Fuel Consumption at 100%(MMscf/hr):	4.46E-07
Max. Fuel Consumption (MMscf/yr):	3.90E-03
Max. Annual Hours of Operation (hr/yr):	8,760

Engine Emissions Data:

Pollutant [1, 2, 3]	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr [4, 5]	tpy [7]	
NO_X	0.50	g/bhp-hr	0.06	0.25	Manufacturer's Specifications
VOC (excludes HCHO)	0.70	g/bhp-hr	0.08	0.35	Manufacturer's Specifications
VOC (includes HCHO)	---	---	0.08	0.35	VOC + HCHO
CO	1.00	g/bhp-hr	0.12	0.51	Manufacturer's Specifications
SO_X	0.001	lb/MMBtu	<0.01	<0.01	AP-42, Table 3.2-3 (Aug-2000)
PM_{10}	0.02	lb/MMBtu	<0.01	<0.01	AP-42, Table 3.2-3 (Aug-2000)
$PM_{2.5}$	0.02	lb/MMBtu	<0.01	<0.01	AP-42, Table 3.2-3 (Aug-2000)
Formaldehyde (HCHO)	0.02	lb/MMBtu	<0.01	<0.01	AP-42, Table 3.2-3 (Aug-2000)
GHG (CO_2e)	See Table Below		0.07	0.29	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	0.03	lb/MMBtu	<0.01	<0.01	AP-42, Table 3.2-3 (Aug-2000)

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

VRU Engine

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr [4, 6]	tpy [7]	
GHGs:					
CO_2	53.06	kg/MMBtu	6.6E-02	0.29	40 CFR 98, Table C-1
CH_4	0.001	kg/MMBtu	1.2E-06	5.5E-06	40 CFR 98, Table C-2
N_2O	0.0001	kg/MMBtu	1.2E-07	5.5E-07	40 CFR 98, Table C-2
GHG (CO_2e)			**0**	**0**	

Notes:

1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type.
4. Emission Rate (lb/hr) = Emission Factor (g/bhp-hr) x Engine Rating (hp) / 453.59 (g/lb)
5. Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) x Engine Rating (MMBtu/hr)
6. Emission Rate (lb/hr) = Emission Factor (kg/MMBtu) x Engine Rating (MMBtu/hr) x 2.205 (lb/kg)
7. Emission Rate (tpy) = Emission Rate (lb/hr) x Hours of Operation (hr/yr) / 2,000 (lb/ton)

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Triethylene Glycol Dehydrator

Operating Parameters: [1]

Source Designation:	**S015**
Wet Gas Temperature (°F):	87.7108
Wet Gas Pressure (psig):	900
Wet Gas Water Content (lb H2O/MMscf): [5]	41.7
Dry Gas Flow Rate (MMscfd):	42
Dry Gas Water Content (lb H2O/MMscf)	1.9470
Lean Glycol Flow Rate (gpm):[6]	7.5
Lean Glycol Water Content (wt% H2O):	0.9
Flash Tank Temperature (°F):	200
Flash Tank Pressure (psig):	57
Flash Tank Control Device:	Combustor
Combustor Control Efficiency (%):	98%
Regenerator Primary Control Device Type:	BTEX Condenser
Control Device Temperature (°F):[8]	10
Control Device Pressure (psia):	14.7
Regenerator Secondary Control Device Type:[7]	Reboiler with Glow Plug
Overall Regenerator Control Efficiency (%):	95%
Potential Annual Hours of Operation (hr/yr):	8,760

GRI-GLYCalc Version 4.0 - EMISSIONS SUMMARY
Controlled Regenerator Emissions

Pollutant	(lbs/hr)	(lbs/day)	(tons/yr)
CO2	0.1820	4.368	0.79716
Methane	0.0282	0.678	0.1237
Ethane	0.0702	1.686	0.3076
Propane	0.0962	2.309	0.4215
Isobutane	0.0218	0.524	0.0957
n-Butane	0.0763	1.832	0.3343
Isopentane	0.0105	0.252	0.0459
n-Pentane	0.0184	0.441	0.0805
Cyclopentane	0.0001	0.002	0.0003
n-Hexane*	0.0024	0.058	0.0106
Cyclohexane	0.0016	0.037	0.0068
Other Hexanes	0.0038	0.090	0.0165
Heptanes	0.0006	0.014	0.0025
Methylcyclohexane	0.0006	0.015	0.0028
2,2,4-Trimethylpentane*	0.0000	0.000	0.0000
Benzene*	0.0022	0.052	0.0095
Toluene*	0.0010	0.024	0.0044
Ethylbenzene*	0.0001	0.002	0.0003
Xylenes*	0.0001	0.003	0.0006
C8 + Heavier Hydrocarbons	0.0001	0.0001	0.0001
Total Emissions	0.5161	12.387	2.2607
Total Hydrocarbon Emissions	0.3341	8.019	1.4635
Total VOC Emissions	0.2357	5.656	1.0322
Total HAP Emissions	0.0058	0.139	0.0254

GRI-GLYCalc Version 4.0 - EMISSIONS SUMMARY
Controlled Flash Tank Emissions

Pollutant	(lbs/hr)	(lbs/day)	(tons/yr)
CO2	103.00	2472	451.14
Methane	0.2031	4.872	0.8894
Ethane	0.1764	4.234	0.7728
Propane	0.1379	3.331	0.6040
Isobutane	0.0269	0.645	0.1176
n-Butane	0.0864	2.073	0.3784
Isopentane	0.0200	0.481	0.0878
n-Pentane	0.0327	0.785	0.1432
Cyclopentane	<0.0001	0.001	0.0002
n-Hexane*	0.0073	0.176	0.0321
Cyclohexane	0.0016	0.038	0.0069
Other Hexanes	0.0090	0.215	0.0394
Heptanes	0.0057	0.138	0.0251
Methylcyclohexane	0.0013	0.030	0.0055
2,2,4-Trimethylpentane*	0.0000	0.000	0.0000
Benzene*	0.0005	0.011	0.0020
Toluene*	0.0006	0.013	0.0025
Ethylbenzene*	0.0001	0.002	0.0004
Xylenes*	0.0002	0.005	0.0008
C8 + Heavier Hydrocarbons	0.0087	0.209	0.0381
Total Emissions	103.7183	2489.24	454.286
Total Hydrocarbon Emissions	0.7183	17.24	3.146
Total VOC Emissions	0.3388	8.13	1.484
Total HAP Emissions	0.0086	0.21	0.038

GRI-GLYCalc Version 4.0 - EMISSIONS SUMMARY
Controlled Total Emission Rates

Pollutant	(lbs/hr)	(lbs/day)	(tons/yr)
CO2	103.1820	2476.37	451.937
Methane	0.2312	5.55	1.013
Ethane	0.2467	5.92	1.080
Propane	0.2341	5.62	1.026
Isobutane	0.0487	1.17	0.213
n-Butane	0.1627	3.91	0.713
Isopentane	0.0305	0.73	0.134
n-Pentane	0.0511	1.23	0.224
Cyclopentane	0.0001	0.00	0.001
n-Hexane*	0.0097	0.23	0.043
Cyclohexane	0.0031	0.08	0.014
Other Hexanes	0.0128	0.31	0.056
Heptanes	0.0063	0.15	0.028
Methylcyclohexane	0.0019	0.05	0.008
2,2,4-Trimethylpentane*	0.0000	0.000	0.0000
Benzene*	0.0026	0.06	0.011
Toluene*	0.0016	0.04	0.007
Ethylbenzene*	0.0002	0.00	0.001
Xylenes*	0.0003	0.01	0.001
C8 + Heavier Hydrocarbons	0.0087	0.21	0.038
Total Emissions	104.2344	2501.63	456.547
Total Hydrocarbon Emissions	1.0524	25.26	4.610
Total VOC Emissions	0.5745	13.79	2.516
Total HAP Emissions	0.0144	0.35	0.063

Company Name:	**Triad Hunter, LLC**
Facility Name:	**Wells Meckley Wellpad**
Project Description:	**G70-D Application**

Triethylene Glycol Dehydrator

Notes:

1. Operating parameters obtained from Promax simulation.
2. * Denotes HAPs
3. Emissions from the still vent column are routed to a BTEX condensor where heavy consituents in the gas stream are condensed to liquid. The remaining vapor is routed to the reboiler heater.
4. Emissions from the flash tank are routed to the enclosed combustor.
5. "Saturated" is selected in GLYCalc in order to run the simulation.
6. The glycol pumps are Kimray 45020 pneumatic pumps.
7. When fuel to the reboiler burner is cut off, emissions are routed to a glow plug for destruction.
8. 32 degrees F is selected in GLYCalc in order to run the simulation.

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Reboiler

Emission Unit ID:	**S023**
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,267
Heat Input (MMBtu/hr)	0.75
Fuel Consumption (MMscf/hr):	5.92E-04
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor [1, 2]	Emission Factor Unit of Measure	Potential Emissions	
			(lb/hr)[3, 4]	(tons/yr)[5]
NO_x	100	lb/MMscf	0.07	0.32
CO	84	lb/MMscf	0.06	0.27
VOC	5.5	lb/MMscf	4.0E-03	0.02
SO_2	0.6	lb/MMscf	4.4E-04	1.9E-03
PM Total	7.6	lb/MMscf	0.01	0.02
PM Condensable	5.7	lb/MMscf	4.2E-03	0.02
PM_{10} (Filterable)	1.9	lb/MMscf	1.4E-03	0.01
$PM_{2.5}$ (Filterable)	1.9	lb/MMscf	1.4E-03	0.01
Lead	5.00E-04	lb/MMscf	3.7E-07	1.6E-06
CO_2	117.0	lb/MMBtu	87.75	384.34
CH_4	2.21E-03	lb/MMBtu	1.7E-03	7.2E-03
N_2O	2.21E-04	lb/MMBtu	1.7E-04	7.2E-04
Total HAP	1.89	lb/MMscf	1.39E-03	0.01

Notes:

1. Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3
2. GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.
3. Emission Rate (lb/hr) = Emission Factor (lb/MMscf) / 1,020 (Btu/scf) x Rated Capacity (MMBtu/hr)
4. Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) x Rated Capacity (MMBtu/hr)
5. Emission Rate (tons/yr) = Emissions (lb/hr) x Operating hours (hrs/yr) / 2,000 (lb/ton)

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Enclosed Combustor

Source Designation:	**C001**
Pilot Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,267
Pilot Fuel Consumption (scf/hr):	2.0E+01
Pilot Heat Input (MMBtu/hr):	0.03
Combustor Rating (MMBtu/hr):	10.0
Potential Annual Hours of Operation (hr/yr):	8,760

Enclosed Combustor Emissions

Pollutant	Emission Factors [1, 2]	Emission Factor Units	Combustor (lb/hr)	Combustor (tpy)	Pilot (lb/hr)	Pilot (tpy)	Total (lb/hr)	Total (tpy)
NO_X	100.00	lb/MMscf	0.98	4.29	2.5E-03	0.01	0.98	4.30
CO	84.00	lb/MMscf	0.82	3.61	2.1E-03	0.01	0.83	3.62
VOC	5.50	lb/MMscf	---	---	1.4E-04	6.0E-04	0.00	0.00
SO_2	6.0E-01	lb/MMscf	0.01	0.03	1.5E-05	6.5E-05	0.01	0.03
PM/PM_{10}	7.60	lb/MMscf	0.07	0.33	1.9E-04	8.3E-04	0.07	0.33
CO_2	53.06	kg/MMBtu	1169.973	5124.482	2.96	12.99	1172.94	5137.47
CH_4	1.0E-03	kg/MMBtu	---	---	0.00	2.4E-04	0.00	0.00
N_2O	1.0E-04	kg/MMBtu	0.002	0.01	0.00	2.4E-05	2.2E-03	0.01

Notes:
1. Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1 & 1.4-2.
2. GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.
2. Emission Rate (lb/hr) = Emission Factor (lb/MMscf) / 1,020 (Btu/scf) x Rated Capacity (MMBtu/hr)
3. Emission Rate (tons/yr) = Emissions (lb/hr) x Operating hours (hrs/yr) / 2,000 (lb/ton)

Combustor Maximum Loading:

Waste Stream	Mass Flow Rate (lb/hr)	Net Heating Value (Btu/scf)	Flow Rate (scf/hr)
Dehydration Unit Flash Tank	22.08	1496.60	74.68
Condensate Tanks	294.67	2715.65	2090.10
Produced Water Tanks	17.46	1036.16	343.62
Total	**334.22**	**2449.29**	**2508.39**

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Fugitive Emissions

Default Average Component Counts for Major Onshore Natural Gas Production [1]

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

Fugitive VOC/Total Emissions from Component Leaks

Equipment Type	Service	Emission Factors[2] (kg/hr/source)	Facility Equipment Count[3] (units)	TOC Annual Fugitive Emissions (tpy)	Weight Fraction VOC	Weight Fraction HAP	VOC Emissions[4, 5] (tpy)	HAP Emissions[4, 5] (tpy)
Pumps	Light Oil	1.30E-02	8	1.00	1.00	0.02	1.00	0.02
Valves	Light Oil	2.50E-03	78	1.89	1.00	0.02	1.89	0.04
Pressure Relief Valves	Light Oil	7.50E-03	6	0.43	1.00	0.02	0.43	0.01
Open-Ended Lines	Light Oil	1.40E-03	6	0.08	1.00	0.02	0.08	1.8E-03
Flanges	Light Oil	1.10E-04	173	0.18	1.00	0.02	0.18	4.2E-03
Connectors	Light Oil	2.10E-04	347	0.70	1.00	0.02	0.70	0.02
Valves	Gas	4.50E-03	235	10.20	0.27	0.01	2.80	0.06
Pressure Relief Valves	Gas	8.80E-03	18	1.53	0.27	0.01	0.42	0.01
Open-Ended Lines	Gas	2.00E-03	17	0.33	0.27	0.01	0.09	2.1E-03
Flanges	Gas	3.90E-04	520	1.96	0.27	0.01	0.54	0.01
Connectors	Gas	2.00E-04	1,040	2.01	0.27	0.01	0.55	0.01
Intermittent Pneumatic Devices	Gas	13.5	30	---	---	---	9.77	0.22
			Emission Totals:	**20.32**	**---**	**---**	**18.46**	**0.42**

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Fugitive Emissions

Fugitive Specific HAP Emissions from Component Leaks

Equipment Type	Service	Emission Factors[2] (kg/hr/source)	Facility Equipment Count[3] (units)	TOC Annual Fugitive Emissions (tpy)	Benzene Emissions[4, 5] (tpy)	Toluene Emissions[4, 5] (tpy)	Ethylbenzene Emissions[4, 5] (tpy)	Xylene Emissions[4, 5] (tpy)	n-Hexane Emissions[4, 5] (tpy)
Pumps	Light Oil	1.30E-02	8	1.00	2.9E-04	6.6E-04	3.0E-04	7.6E-04	0.02
Valves	Light Oil	2.50E-03	78	1.89	5.5E-04	1.2E-03	5.7E-04	1.4E-03	0.04
Pressure Relief Valves	Light Oil	7.50E-03	6	0.43	1.3E-04	2.9E-04	1.3E-04	3.3E-04	0.01
Open-Ended Lines	Light Oil	1.40E-03	6	0.08	2.3E-05	5.1E-05	2.3E-05	5.9E-05	1.6E-03
Flanges	Light Oil	1.10E-04	173	0.18	5.4E-05	1.2E-04	5.5E-05	1.4E-04	3.9E-03
Connectors	Light Oil	2.10E-04	347	0.70	2.1E-04	4.6E-04	2.1E-04	5.3E-04	0.01
Valves	Gas	4.50E-03	235	10.20	8.2E-04	1.8E-03	8.4E-04	2.1E-03	0.06
Pressure Relief Valves	Gas	8.80E-03	18	1.53	1.2E-04	2.8E-04	1.3E-04	3.2E-04	0.01
Open-Ended Lines	Gas	2.00E-03	17	0.33	2.7E-05	6.0E-05	2.8E-05	7.0E-05	1.9E-03
Flanges	Gas	3.90E-04	520	1.96	1.6E-04	3.5E-04	1.6E-04	4.1E-04	0.01
Connectors	Gas	2.00E-04	1,040	2.01	1.6E-04	3.6E-04	1.7E-04	4.2E-04	0.01
Intermittent Pneumatic Devices	Gas	13.5	30	---	2.9E-03	0.01	2.9E-03	0.01	0.20
			Emission Totals:	**20.32**	**0.01**	**0.01**	**0.01**	**0.01**	**0.39**

Fugitive Greenhouse Gas Emissions from Component Leaks

Component	Service	Component Count	GHG Emission Factor[6] (scf/hr/component)	CH_4 Emissions[7] (tpy)	CO_2 Emissions[7] (tpy)	CO_2e Emissions[8] (tpy)
Pumps	Light Oil	8	0.01	0.01	6.8E-05	0.26
Valves	Light Oil	78	0.05	0.51	3.3E-03	12.75
Pressure Relief Valves	Light Oil	6	0.3	0.23	1.5E-03	5.87
Open-Ended Lines	Light Oil	6	0.05	0.04	2.4E-04	0.94
Flanges	Light Oil	173	0.003	0.07	4.4E-04	1.69
Connectors	Light Oil	347	0.007	0.32	2.1E-03	7.91
Valves	Gas	235	0.027	0.83	0.01	20.66
Pressure Relief Valves	Gas	18	0.04	0.09	6.1E-04	2.35
Open-Ended Lines	Gas	17	0.061	0.14	8.9E-04	3.43
Flanges	Gas	520	0.003	0.20	1.3E-03	5.08
Connectors	Gas	1,040	0.003	0.41	2.6E-03	10.17
Intermittent Pneumatic Devices	Gas	30	13.5	17.60	0.11	440.08
			Total	**20.44**	**0.13**	**511.18**

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Fugitive Emissions

Emissions from Blowdowns:

Venting Type	Number of Events[9]	Gas Volume[9] (scf/event)	VOC Emissions[10] (tpy)	HAP Emissions[10] (tpy)	CH_4 Emissions[7] (tpy)	CO_2 Emissions[7] (tpy)	CO_2e Emissions[8] (tpy)
Compressor	162	3,077	4.12	0.09	7.42	4.8E-02	185.51
Total			**4.12**	**0.09**	**7.42**	**4.8E-02**	**185.51**

HAP Emissions from Blowdowns:

Venting Type	Number of Events[9]	Gas Volume[9] (scf/event)	Benzene Emissions[10] (tpy)	Toluene Emissions[10] (tpy)	Ethylbenzene Emissions[10] (tpy)	Xylene Emissions[10] (tpy)	n-Hexane Emissions[10] (tpy)
Compressor	162	3,077	1.2E-03	2.7E-03	1.2E-03	3.1E-03	0.09
Total			**1.2E-03**	**2.7E-03**	**1.2E-03**	**3.1E-03**	**0.09**

Notes:

1. Table W-1B to Subpart W of Part 98 —Default Average Component Counts for Major Onshore Natural Gas Production, with site-specific counts for pressure relief valves.
2. 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.
3. Facility component counts for valves, connectors, open-ended lines, and pressure relief valves are based on equipment counts. One pump is assumed for each storage tank. One meter and five pneumatic devices are assumed per wellhead. Flanges are assumed to equal half of the connector counts. 25% of all components are assumed to be in liquid service, and 75% are assumed to be in gas service.
4. Component 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)

5. Pneumatic Device Potential emissions VOC/HAP (tpy) = Emission factor (kg/hr/source) * Number of Sources * 2,920 (hrs/yr) / 379 (scf/lb-mol) * Molar weight of natural gas (lb/lb-mol) * Weight % VOC/HAP / 100 / 2,000 (lb/ton)
6. Greenhouse gas emission factors from 40 CFR 98 Subpart W Table W-1A.
7. Calculated in accordance with Equations W-32a, W-35 and W-36 in Subpart W of 40 CFR 98.
   Mole fractions of CH_4 and CO_2 based on gas analysis:
   CH_4: 70% CO_2: 0.17%
8. 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
9. Assumes 4.5 blowdowns per month per compressor. Gas volume per event is based on an engineering estimate.
10. VOC and HAP emissions are based on sum of the fractions of the pollutants in the site-specific gas analysis in those classifications, and are calculated in accordance with standard conversion methodology and factors.

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley 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	4.8	4.8	AP-42 Table 13.2.2-1 (11/06), for Sand and Gravel Processing
Number of Rain Days, p	150	150	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	42	30.815	0.47	9,810	9,289	0	20.14	5.13	0.51
Employee Vehicles	3	3	3	0.47	500	473	0	0.36	0.09	0.01
Total Potential Emissions								**20.50**	**5.22**	**0.52**

Company Name: Triad Hunter, LLC
Facility Name: Wells Meckley Wellpad
Project Description: G70-D Application

Gas Analysis

Sample Location: Wells Meckley Field Gas
Sample Date: [1] Promax Simulation - Vapor Stream 1 and Fuel Gas Stream
HHV (Btu/scf): 1,267

Constituent	Natural Gas Stream Speciation (Mole %)	Molecular Weight	Molar Weight	Average Weight Fraction	Natural Gas Stream Speciation (Wt. %)
Carbon Dioxide	0.167	44.01	0.07	0.00	0.322
Nitrogen	0.468	28.01	0.13	0.01	0.574
Methane	70.313	16.04	11.28	0.49	49.398
Ethane	16.906	30.07	5.08	0.22	22.266
Propane	6.918	44.10	3.05	0.13	13.363
Isobutane	0.836	58.12	0.49	0.02	2.128
n-Butane	2.242	58.12	1.30	0.06	5.708
Isopentane	0.502	72.15	0.36	0.02	1.586
n-Pentane	0.699	72.15	0.50	0.02	2.209
Cyclopentane	0.000	70.1	0.0	0.0	0.001
Methylcyclopentane	0.018	84.2	0.0	0.0	0.066
n-Hexane	0.152	86.18	0.13	0.01	0.575
Cyclohexane	0.018	84.16	0.02	0.00	0.067
Methylcyclohexane	0.022	98.19	0.02	0.00	0.095
Other Hexanes	0.179	86.18	0.15	0.01	0.674
Heptanes	0.122	100.21	0.12	0.01	0.535
Octanes	0.011	114.23	0.01	0.00	0.056
Benzene*	0.002	78.11	0.00	0.00	0.008
Toluene*	0.004	92.14	0.00	0.00	0.018
Ethylbenzene*	0.002	106.17	0.00	0.00	0.008
Xylenes*	0.004	106.16	0.00	0.00	0.021
2,2,4-Trimethylpentane	<0.001	114.23	0.00	0.00	0.000
C8 + Heavies	0.056	130.80	0.07	0.00	0.320
Totals	100.00		22.83	1.00	100

TOC (Total)	99.01	99.10
VOC (Total)	11.79	27.44
HAP (Total)	0.17	0.63

Notes:
1. The fuel gas higher heating value from the Fuel Gas Stream is used to calculate fuel quantities. The speciation of the field gas is used to calculate emissions from fugitive component leaks and blowdowns.

Retrograde Gas PVT Fluid Study
for
Triad Hunter, LLC
Collins No. 1117H
Middlebourne Field
Tyler County, West Virginia

FESCO, Ltd.

Petroleum Engineers

Table of Contents

February 25, 2014

Mr. Kurt Wielitzka
Triad Hunter, LLC
27724 S. Rt. 7
Marietta, Ohio 45750

Re:		
	Well:	Collins No. 1117H
	Field:	Middlebourne
	Location:	Tyler County, West Virginia
	Formation:	Marcellus
	Perforations:	6625 – 11318 ft MD
	Test Type:	Retrograde Gas PVT Fluid Study

Dear Mr. Wielitzka:

The attached report contains results from a laboratory study performed on the recombined separator fluids from the subject well. The study determined the type and character of the reservoir fluid. The fluid study was performed using first-stage separator gas and oil samples obtained from the well on December 26, 2013 by FESCO, Ltd. FESCO then delivered the separator samples to its PVT laboratory in Alice, Texas. Extended compositional analyses were performed on the separator gas (C_{11+}) and on the separator oil (C_{31+}) samples. Tables 1-A through 1-C list the compositional analyses of the separator gas, separator oil and mathematically recombined wellstream fluid through C_{7+}, C_{11+} and C_{31+}, respectively. Table 2 reports the fluid properties measured as the separator oil was flashed from separator conditions to ambient laboratory conditions.

The separator gas and oil were physically recombined in a visual PVT cell at the reservoir temperature of 160 °F and at the reported gas-oil ratio of 9680 Scf/Sep Bbl (18501 Scf/STB). The recombined fluid was evaluated during a Constant Composition Expansion (CCE) process at pressures ranging from 7000 to 1024 psig. The resulting CCE data is reported in Table 3. ***A retrograde dew point was observed at 2694 psig.*** The static reservoir pressure is higher than the observed retrograde dew point pressure. Therefore, the reservoir fluid exists as undersaturated (single-phase) gas at static reservoir conditions of 4266 psig and 160 °F. Figures 1 through 7 illustrate the data reported in Table 3.

A Constant Volume Depletion (CVD) study was performed on the reservoir fluid to model wellstream production below the dew point. A CVD study consists of a series of expansions and constant pressure displacements terminating at the original saturated reservoir (dew point) volume. Table 4 provides the displaced wellstream volume and compositional analysis measured at each depletion pressure. The Abandonment CVD residual oil composition is reported in the Appendix. Figures 8 and 10 illustrate the gas deviation factors (equilibrium gas and 2-phase) and cumulative produced wellstream volume, respectively, versus pressure as reported in Table 4. Figure 9 shows the corresponding P/Z (equilibrium gas and 2-phase) versus cumulative produced wellstream percent. Figure 11 presents the C_{3+}, C_{4+} and C_{5+} GPM content of the wellstream gas at each depletion pressure.

The cumulative stock tank oil and sales gas recoveries using normal-temperature two-stage separation were calculated from the produced wellstream volumes and their corresponding compositions. The plant liquid products produced during the two-stage separation were also calculated. The total plant products in the wellstream were then determined. The results are shown in Table 5. All recoveries are based on one MMscf of original reservoir fluid at the retrograde dew point and 100 percent plant efficiency.

Table 6 contains the cumulative retrograde liquid volume that condensed during the CVD process at reservoir temperature (160 °F). The maximum observed volume of condensed retrograde liquid was 1.259 percent of the hydrocarbon pore space at 1600 psig. Figures 12 and 13 illustrate the condensed retrograde liquid volume reported in Table 6 versus pressure.

Thank you for this opportunity to serve Triad Hunter, LLC. Please call me if you have any questions or concerns regarding this report.

Sincerely,

FESCO, Ltd.

Armando Ramirez
Natural Gas Engineer
Alice, Texas
Phone: 361-661-7015
Email:Armando.Ramirez@FescoInc.com

Eddie Bickham, P. E.
Vice - President
Alice, Texas
Phone: 361-661-7000 Ext. 115
Email: Ed.Bickham@FescoInc.com

FESCO, Ltd.

Petroleum Engineers

WELL SUMMARY

WELL INFORMATION

Company:	Triad Hunter, LLC
Well Name:	Collins No. 1117H
Field:	Middlebourne
Location:	Tyler County, West Virginia

RESERVOIR INFORMATION

Formation:	Marcellus
Perforations:	6625 - 11318 ft MD
Reservoir Datum:	Unavailable
Reservoir Temperature:	160 °F
Static Reservoir Pressure:	4266 psig
Flowing Reservoir Pressure:	Unavailable

SAMPLE INFORMATION

Sampling Date:	12/26/2013
Sampled By:	FESCO, Ltd. - Shinnston, WV
Sample Type:	1st-Stage Separator Gas and Oil
Flowing Tubing Pressure:	1859 psig
1st Stage Separator Pressure:	580 psig
1st Stage Separator Temperature:	52 °F
2nd Stage Separator Pressure:	55 psig
2nd Stage Separator Temperature:	50 °F

PRODUCTION INFORMATION

Test Date:	12/26/2013
1st Stage Separator Gas Rate:	8292 Mcf/d
Stock Tank Oil Rate:	448.20 STB/d
Water Rate:	455.60 STB/d
Stock Tank Gas-Oil Ratio:	18501 Scf 1st Stage Gas / STB
Separator Gas-Oil Ratio:	9680 Scf 1st Stage Gas / Sep Bbl
Separator Oil Volume Factor:	1.91127 Sep Oil Vol / STO Vol

FESCO, Ltd.

Petroleum Engineers

RESULTS SUMMARY

Company:	Triad Hunter, LLC
Well:	Collins No. 1117H
Type of Test:	Retrograde Gas PVT Fluid Study
Reservoir Fluid Type:	Undersaturated Gas
Saturation Conditions:	
Pressure (Retrograde Dew Point):	2694 psig
Temperature:	160 °F
Gas Deviation Factor (Z):	0.73605
Gas Expansion Factor:	1.15532 Mscf/Bbl
Reservoir Conditions:	
Pressure:	4266 psig
Temperature:	160 °F
Gas Deviation Factor (Z):	0.88258
Gas Expansion Factor:	1.52572 Mscf/Bbl
Report Date:	2/25/2014

FESCO, Ltd.

Petroleum Engineers

SAMPLE SUMMARY

Company:	Triad Hunter, LLC
Well:	Collins No. 1117H
Sample Date:	12/26/13

Separator Conditions

Pressure:	580 psig
Temperature:	52 °F

Laboratory Quality Test

Separator Gas:	Pressure	Temperature
Cylinder ID No. G-1042*	563 psig	70 °F
Cylinder ID No. CTC-17	557 psig	70 °F

Separator Liquid:	BP Pressure	Temperature
Cylinder ID No. T-3008*	582 psig	70 °F
Cylinder ID No. T-4070	571 psig	70 °F

Report Date: 2/25/2014

* Samples used in fluid study

Triad Hunter, LLC
Collins No. 1117H

TABLE 1-B

COMPOSITIONAL ANALYSIS OF THE SEPARATOR GAS, OIL AND MATHEMATICALLY RECOMBINED WELLSTREAM THROUGH C_{11+}

SEPARATOR GOR.....: 9680 Scf/Sep Bbl
SEPARATOR PRESSURE.....: 580 psig
SEPARATOR TEMPERATURE.....: 52 °F

	SEPARATOR GAS		SEPARATOR OIL		WELLSTREAM	
Component	Mole%	* GPM	Mole %	Liquid Volume %	Mole %	* GPM
Hydrogen Sulfide	0.000	0.000	0.000	0.000	0.000	0.000
Nitrogen	0.520	0.000	0.035	0.012	0.461	0.000
Carbon Dioxide	0.179	0.000	0.063	0.034	0.165	0.000
Methane	76.243	0.000	17.010	9.055	69.007	0.000
Ethane	16.041	4.324	18.394	15.454	16.328	4.402
Propane	5.042	1.400	17.860	15.458	6.608	1.835
Iso-butane	0.451	0.149	3.491	3.589	0.822	0.271
N-butane	1.044	0.332	11.243	11.135	2.290	0.728
2-2 Dimethylpropane	0.008	0.003	0.143	0.172	0.024	0.009
Iso-pentane	0.152	0.056	3.854	4.428	0.604	0.223
N-pentane	0.186	0.068	5.900	6.719	0.884	0.323
2-2 Dimethylbutane	0.003	0.001	0.091	0.119	0.014	0.006
Cyclopentane	0.001	0.000	0.000	0.000	0.001	0.000
2-3 Dimethylbutane	0.004	0.002	0.192	0.247	0.027	0.011
2 Methylpentane	0.026	0.011	1.321	1.723	0.184	0.077
3 Methylpentane	0.015	0.006	0.863	1.106	0.119	0.049
Other Hexanes	0.000	0.000	0.000	0.000	0.000	0.000
n-Hexane	0.037	0.015	2.594	3.351	0.349	0.145
Methylcyclopentane	0.003	0.001	0.316	0.351	0.041	0.015
Benzene	0.001	0.000	0.039	0.034	0.006	0.002
Cyclohexane	0.004	0.001	0.364	0.389	0.048	0.016
2-Methylhexane	0.005	0.002	1.025	1.497	0.130	0.061
3-Methylhexane	0.006	0.003	0.885	1.276	0.113	0.052
2,2,4 Trimethylpentane	0.000	0.000	0.000	0.000	0.000	0.000
Other Heptanes	0.005	0.002	0.361	0.501	0.048	0.022
n-Heptane	0.009	0.004	1.740	2.522	0.220	0.103
Methylcyclohexane	0.004	0.002	0.891	1.126	0.112	0.046
Toluene	0.001	0.000	0.189	0.198	0.024	0.008
Other C-8's	0.006	0.003	2.459	3.679	0.306	0.147
n-Octane	0.002	0.001	1.055	1.698	0.131	0.067
Ethylbenzene	0.000	0.000	0.188	0.228	0.023	0.009
M&P-Xylene	0.001	0.000	0.212	0.259	0.027	0.010
O-Xylene	0.000	0.000	0.340	0.406	0.042	0.016
Other C-9's	0.001	0.001	1.470	2.456	0.180	0.097
n-Nonane	0.000	0.000	0.599	1.058	0.073	0.041
Other C10's	0.000	0.000	1.420	2.608	0.173	0.102
n-Decane	0.000	0.000	0.349	0.674	0.043	0.026
Undecanes Plus	0.000	0.000	3.044	6.435	0.372	0.252
TOTAL	100.000	6.388	100.000	100.000	100.000	9.171

TABLE 1-B

COMPOSITIONAL ANALYSIS OF THE SEPARATOR GAS, OIL AND MATHEMATICALLY RECOMBINED WELLSTREAM THROUGH C_{11+}

SEPARATOR GOR.....: 9680 Scf/Sep Bbl
SEPARATOR PRESSURE.....: 580 psig
SEPARATOR TEMPERATURE.....: 52 °F

UNDECANES PLUS (C_{11+}) FRACTION CHARACTERISTICS					
	Specific Gravity		Molecular Weight	Vapor Volume	Gross Heating Value
COMPONENT	°API	**	lb/lb-mole	Scf/Gal	***
Gas	N/A	0.8250	156.000	16.558	8,400
Oil	46.599	0.7945	168.700	14.745	128,548
Wellstream	N/A	0.7945	168.700	14.745	N/A

TOTAL SAMPLE CHARACTERISTICS						
	Specific Gravity		Molecular Weight	Vapor Volume	Gross Heating Value	
					Dry	Saturated
COMPONENT	°API	**	lb/lb-mole	Scf/Gal	***	***
Gas	N/A	0.7188	20.743	156.532	1,268	1,247
Oil	118.439	0.5661	56.871	31.168	N/A	99,201
Wellstream	N/A	0.8686	25.156	47.536	N/A	N/A

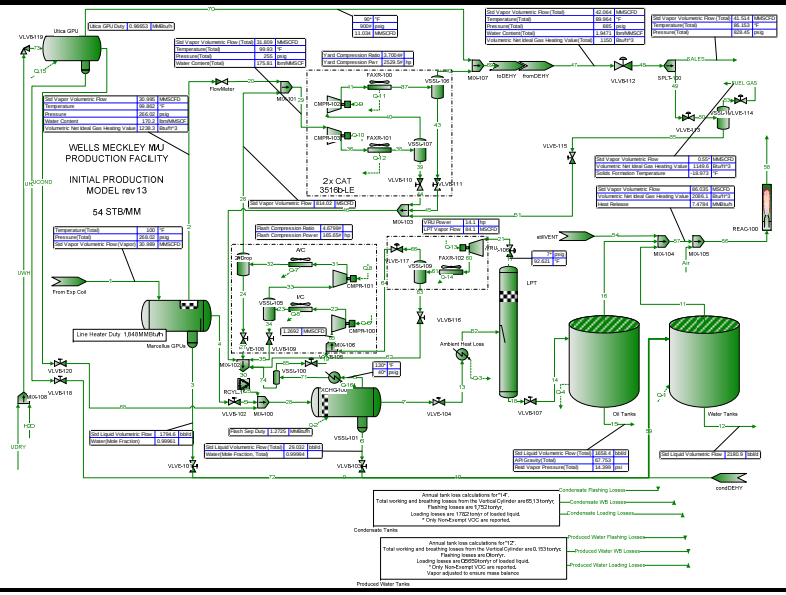
* GPM (gallons per Mscf) determined at 14.85 psia and 60 °F

** Gas specific gravity and wellstream specific gravity determined relative to air (SG=1.000).
Oil specific gravity determined relative to water (SG=1.000).

*** Gross Heating Value units for gas (real basis) and oil are BTU/Scf and BTU/Gal, respectively.

Conventional Production Facility
Plant Schematic

Client Name:	Triad Hunter	Job:
Location:	Wells Meckley	
Flowsheet:	Conventional Production Facility	



* User Specified Values
? Extrapolated or Approximate Values

WELLS MECKLEY M/U PRODUCTION FACILITY

INITIAL PRODUCTION MODEL rev 13

54 STB/MM

Utica GPU Duty	0.96653	MMBtu/h

90*	°F	
900#	psig	
11.034	MMSCFD	

Std Vapor Volumetric Flow (Total)	31.809	MMSCFD
Temperature(Total)	99.93	°F
Pressure(Total)	255	psig
Water Content(Total)	175.81	lbm/MMSCF

Yard Compression Ratio	3.7004#	
Yard Compression Pwr	2529.5#	hp

Std Vapor Volumetric Flow (Total)	42.064	MMSCFD
Temperature(Total)	89.964	°F
Pressure(Total)	885	psig
Water Content(Total)	1.9471	lbm/MMSCF
Volumetric Net Ideal Gas Heating Value(Total)	1150	Btu/ft^3

Std Vapor Volumetric Flow (Total)	41.514	MMSCFD
Temperature(Total)	86.153	°F
Pressure(Total)	828.45	psig

Std Vapor Volumetric Flow	30.995	MMSCFD
Temperature	99.862	°F
Pressure	266.02	psig
Water Content	170.2	lbm/MMSCF
Volumetric Net Ideal Gas Heating Value	1238.3	Btu/ft^3

Temperature(Total)	100	°F
Pressure(Total)	268.02	psig
Std Vapor Volumetric Flow (Vapor)	30.989	MMSCFD

Std Vapor Volumetric Flow	814.02	MSCFD

Flash Compression Ratio	4.6799#	
Flash Compression Power	165.65#	hp

VRU Power	14.1	hp
LPT Vapor Flow	84.1	MSCFD

7*	psig	
92.621	°F	

Std Vapor Volumetric Flow	0.55*	MMSCFD
Volumetric Net Ideal Gas Heating Value	1149.6	Btu/ft^3
Solids Formation Temperature	-18.973	°F

Std Vapor Volumetric Flow	86.199	MSCFD
Volumetric Net Ideal Gas Heating Value	2082.7	Btu/ft^3
Heat Release	7.4801	MMBtu/h

130*	°F	
40*	psig	

Std Liquid Volumetric Flow	1794.6	bbl/d
Water(Mole Fraction)	0.99961	

Std Liquid Volumetric Flow (Total)	29.032	bbl/d
Water(Mole Fraction, Total)	0.99994	

Std Liquid Volumetric Flow (Total)	1658.4	bbl/d
API Gravity(Total)	67.753	
Reid Vapor Pressure(Total)	14.399	psi

Std Liquid Volumetric Flow	2180.8	bbl/d

1.2692	MMSCFD	

Flash Sep Duty	1.2725	MMBtu/h

Line Heater Duty	1.848	MMBtu/h

2 x CAT 3516b-LE

Utica GPU
VLVE-119
73
Q-15
70
FlowMeter
20
MIX-101
29
FAXR-100
41
37
Q-11
VSSL-106
42
CMPR-102
Q-9
40
43
CMPR-103
Q-10
FAXR-101
36
38
Q-12
VSSL-107
39
VLVE-110
VLVE-111
44
45
MIX-103
46
51
26
MIX-107
69
toDEHY
fromDEHY
47
VLVE-112
48
SPLT-100
SALES
49
FUEL GAS
53
VLVE-114
VSSL-1(
50
VLVE-113
55
VLVE-115
58
REAC-100
UH
UCOND
UWH
UDRY
H2O
From Exp Coil
1
2
3
4
Marcellus GPUs
VLVE-120
VLVE-118
MIX-108
68
VLVE-102
MIX-100
5
28
RCYL-1
25
30
74
MIX-102
35
VLVE-108
VLVE-109
27
24
A/C
2#Drop
32
Q-7
31
Q-8
CMPR-101
33
I/C
VSSL-105
23
Q-5
22
Q-6
CMPR-100
34
1.2692 MMSCFD
65
MIX-106
VLVE-105
19
62
64
VSSL-100
85
71
8
Q-16
XCHG-100
Q-2
Flash Sep Duty 1.2725 MMBtu/h
VSSL-101
6
7
VLVE-104
13
VLVE-101
VLVE-103
72
9
10
condDEHY
Condensate Flashing Losses
VLVE-117
66
VSSL-109
Q-13
FAXR-102
60
Q-14
61
VRU-106
21
17
LPT
63
VLVE-116
52
Ambient Heat Loss
Q-3
18
VLVE-107
14
Q-4
16
Oil Tanks
15
stillVENT
54
MIX-104
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MIX-105
56
Air
11
Water Tanks
12
59
Q-1

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Connections

	Condensate Flashing Losses	Condensate Loading Losses	Condensate WB Losses	FUEL GAS	Produced Water Flashing Losses
From Block	--	--	--	VLVE-114	--
To Block	--	--	--	--	--

Stream Composition

Mole Fraction	Condensate Flashing Losses	Condensate Loading Losses	Condensate WB Losses	FUEL GAS	Produced Water Flashing Losses
H2S	0 *	0 *	0 *	0	
N2	3.85441E-06 *	2.55479E-07 *	2.55479E-07 *	0.004539	
CO2	0.000169131 *	0.000156716 *	0.000156716 *	0.00124541	
C1	0.0080802 *	0.00205242 *	0.00205242 *	0.776543	
C2	0.0964902 *	0.13072 *	0.13072 *	0.131408	
C3	0.282103 *	0.306268 *	0.306268 *	0.0535907	
iC4	0.0789506 *	0.0783148 *	0.0783148 *	0.00637629	
nC4	0.262499 *	0.268998 *	0.268998 *	0.0165929	
2,2-Dimethylpropane	0.0030359 *	0.00280152 *	0.00280152 *	0.000169637	
iC5	0.0706061 *	0.0659782 *	0.0659782 *	0.00326742	
nC5	0.0946189 *	0.0870993 *	0.0870993 *	0.00415781	
2,2-Dimethylbutane	0.00119817 *	0.0010921 *	0.0010921 *	4.59309E-05	
Cyclopentane	6.46944E-05 *	4.97928E-05 *	4.97928E-05 *	2.60651E-06	
2,3-Dimethylbutane	0.00197962 *	0.00179962 *	0.00179962 *	7.15178E-05	
2-Methylpentane	0.0129176 *	0.0113213 *	0.0113213 *	0.000460549	
3-Methylpentane	0.00757978 *	0.00685809 *	0.00685809 *	0.000262398	
nC6	0.019064 *	0.0171178 *	0.0171178 *	0.000631254	
Methylcyclopentane	0.00224992 *	0.001855 *	0.001855 *	7.36895E-05	
Benzene	0.000293091 *	0.000169412 *	0.000169412 *	9.4878E-06	
Cyclohexane	0.00221088 *	0.00159459 *	0.00159459 *	6.91493E-05	
2-Methylhexane	0.00377669 *	0.000942334 *	0.000942334 *	9.8844E-05	
3-Methylhexane	0.00299759 *	0.00262637 *	0.00262637 *	7.48846E-05	
2,2,4-Trimethylpentane	0 *	0 *	0 *	0	
Heptane	0.00458709 *	0.00386655 *	0.00386655 *	0.000104843	
Methylcyclohexane	0.00227094 *	0.00200787 *	0.00200787 *	4.84617E-05	
Toluene	0.000456441 *	0.000263769 *	0.000263769 *	8.86463E-06	
Octane	0.000936609 *	0.000741749 *	0.000741749 *	8.95509E-06	
Ethylbenzene	0.000151517 *	9.23904E-05 *	9.23904E-05 *	1.2079E-06	
m-Xylene	0.000158987 *	0.000126593 *	0.000126593 *	1.13833E-06	
o-Xylene	0.000215623 *	0.000111554 *	0.000111554 *	1.24458E-06	
n-Nonane	0.000170539 *	0.000129915 *	0.000129915 *	3.09142E-07	
n-Decane	3.41032E-05 *	2.35387E-05 *	2.35387E-05 *	1.01E-08	
Water	0.0341013 *	2.94501E-05 *	2.94501E-05 *	4.10183E-05	
TEG	2.66031E-13 *	2.40888E-16 *	2.40888E-16 *	2.51477E-07	
O2	0 *	0 *	0 *	0	
NO2	0 *	0 *	0 *	0	
N2O	0 *	0 *	0 *	0	
CO	0 *	0 *	0 *	0	
Other C-7's	0.00144281 *	0.00121718 *	0.00121718 *	3.82682E-05	
Other C-8's	0.00354732 *	0.00282219 *	0.00282219 *	5.047E-05	
Other C-9's	0.000732939 *	0.000544367 *	0.000544367 *	3.49603E-06	
Other C-10's	0.000252026 *	0.000174822 *	0.000174822 *	2.3828E-07	
Undecanes Plus	5.26832E-05 *	3.3148E-05 *	3.3148E-05 *	3.14667E-10	

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Molar Flow	Condensate Flashing Losses lbmol/h	Condensate Loading Losses lbmol/h	Condensate WB Losses lbmol/h	FUEL GAS lbmol/h	Produced Water Flashing Losses lbmol/h
H2S	0 *	0 *	0 *	0	0
N2	3.03694E-05 *	2.07235E-07 *	7.5732E-08 *	0.274106	0
CO2	0.00133261 *	0.000127122 *	4.64554E-05 *	0.0752089	0
C1	0.063665 *	0.00166484 *	0.0006084 *	46.8947	0
C2	0.760259 *	0.106035 *	0.0387494 *	7.93561	0
C3	2.22273 *	0.248432 *	0.0907872 *	3.23629	0
iC4	0.622062 *	0.0635259 *	0.0232149 *	0.385058	0
nC4	2.06826 *	0.2182 *	0.0797394 *	1.00203	0
2,2-Dimethylpropane	0.0239203 *	0.00227248 *	0.000830458 *	0.0102442	0
iC5	0.556314 *	0.0535189 *	0.019558 *	0.197316	0
nC5	0.745515 *	0.0706515 *	0.0258189 *	0.251086	0
2,2-Dimethylbutane	0.00944056 *	0.000885867 *	0.000323732 *	0.00277372	0
Cyclopentane	0.000509736 *	4.03899E-05 *	1.47601E-05 *	0.000157405	0
2,3-Dimethylbutane	0.0155977 *	0.00145978 *	0.000533464 *	0.00431889	0
2-Methylpentane	0.101779 *	0.00918339 *	0.00335599 *	0.0278121	0
3-Methylpentane	0.059722 *	0.00556301 *	0.00203295 *	0.0158459	0
nC6	0.150208 *	0.0138853 *	0.00507426 *	0.0381208	0
Methylcyclopentane	0.0177274 *	0.0015047 *	0.000549879 *	0.00445003	0
Benzene	0.0023093 *	0.00013742 *	5.0219E-05 *	0.000572959	0
Cyclohexane	0.0174198 *	0.00129347 *	0.000472685 *	0.00417586	0
2-Methylhexane	0.029757 *	0.000764384 *	0.000279337 *	0.00596909	0
3-Methylhexane	0.0236184 *	0.00213041 *	0.000778538 *	0.00452221	0
2,2,4-Trimethylpentane	0 *	0 *	0 *	0	0
Heptane	0.0361423 *	0.00313639 *	0.00114616 *	0.00633137	0
Methylcyclohexane	0.017893 *	0.00162871 *	0.000595196 *	0.00292655	0
Toluene	0.00359636 *	0.000213959 *	7.81892E-05 *	0.000535326	0
Octane	0.00737967 *	0.000601678 *	0.000219878 *	0.000540789	0
Ethylbenzene	0.00119382 *	7.49435E-05 *	2.73874E-05 *	7.29437E-05	0
m-Xylene	0.00125268 *	0.000102687 *	3.75262E-05 *	6.87425E-05	0
o-Xylene	0.00169892 *	9.04882E-05 *	3.30681E-05 *	7.51588E-05	0
n-Nonane	0.0013437 *	0.000105382 *	3.8511E-05 *	1.86688E-05	0
n-Decane	0.000268703 *	1.90937E-05 *	6.97761E-06 *	6.09932E-07	0
Water	0.268689 *	2.38887E-05 *	8.72992E-06 *	0.00247706	0
TEG	2.09609E-12 *	1.95399E-16 *	7.14066E-17 *	1.51865E-05	0
O2	0 *	0 *	0 *	0	0
NO2	0 *	0 *	0 *	0	0
N2O	0 *	0 *	0 *	0	0
CO	0 *	0 *	0 *	0	0
Other C-7's	0.0113681 *	0.000987329 *	0.00036081 *	0.00231098	0
Other C-8's	0.0279498 *	0.00228925 *	0.000836584 *	0.00304783	0
Other C-9's	0.00577492 *	0.000441569 *	0.000161367 *	0.000211122	0
Other C-10's	0.00198575 *	0.000141809 *	5.18227E-05 *	1.43895E-05	0
Undecanes Plus	0.000415098 *	2.68883E-05 *	9.82609E-06 *	1.90025E-08	0

Mass Fraction	Condensate Flashing Losses	Condensate Loading Losses	Condensate WB Losses	FUEL GAS	Produced Water Flashing Losses
H2S	0 *	0 *	0 *	0	
N2	1.98444E-06 *	1.32215E-07 *	1.32215E-07 *	0.00604853	
CO2	0.0001368 *	0.000127414 *	0.000127414 *	0.00260724	
C1	0.00238237 *	0.000608267 *	0.000608267 *	0.592599	
C2	0.0533235 *	0.0726137 *	0.0726137 *	0.18796	
C3	0.228623 *	0.249491 *	0.249491 *	0.112411	
iC4	0.084336 *	0.0840899 *	0.0840899 *	0.0176293	
nC4	0.280405 *	0.288834 *	0.288834 *	0.0458763	
2,2-Dimethylpropane	0.00402561 *	0.00373405 *	0.00373405 *	0.000582202	

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Mass Fraction	Condensate Flashing Losses	Condensate Loading Losses	Condensate WB Losses	FUEL GAS	Produced Water Flashing Losses
iC5	0.0936239 *	0.0879402 *	0.0879402 *	0.0112139	
nC5	0.125465 *	0.116092 *	0.116092 *	0.0142698	
2,2-Dimethylbutane	0.00189766 *	0.00173861 *	0.00173861 *	0.000188283	
Cyclopentane	8.33881E-05 *	6.45128E-05 *	6.45128E-05 *	8.69573E-06	
2,3-Dimethylbutane	0.00313531 *	0.00286499 *	0.00286499 *	0.000293171	
2-Methylpentane	0.0204588 *	0.0180234 *	0.0180234 *	0.00188792	
3-Methylpentane	0.0120048 *	0.010918 *	0.010918 *	0.00107564	
nC6	0.0301935 *	0.0272515 *	0.0272515 *	0.00258768	
Methylcyclopentane	0.00348005 *	0.00288406 *	0.00288406 *	0.000295007	
Benzene	0.00042076 *	0.000244466 *	0.000244466 *	3.52538E-05	
Cyclohexane	0.00341967 *	0.00247919 *	0.00247919 *	0.000276831	
2-Methylhexane	0.00695509 *	0.00174437 *	0.00174437 *	0.00047114	
3-Methylhexane	0.00552032 *	0.00486172 *	0.00486172 *	0.000356938	
2,2,4-Trimethylpentane	0 *	0 *	0 *	0	
Heptane	0.00844752 *	0.00715743 *	0.00715743 *	0.000499735	
Methylcyclohexane	0.00409799 *	0.00364203 *	0.00364203 *	0.000226346	
Toluene	0.000772931 *	0.000448974 *	0.000448974 *	3.8853E-05	
Octane	0.00196629 *	0.00156527 *	0.00156527 *	4.86596E-05	
Ethylbenzene	0.000295636 *	0.000181203 *	0.000181203 *	6.10007E-06	
m-Xylene	0.000310213 *	0.000248284 *	0.000248284 *	5.74874E-06	
o-Xylene	0.000420719 *	0.000218789 *	0.000218789 *	6.28532E-06	
n-Nonane	0.000401988 *	0.000307817 *	0.000307817 *	1.88606E-06	
n-Decane	8.91783E-05 *	6.18713E-05 *	6.18713E-05 *	6.83591E-08	
Water	0.0112909 *	9.80134E-06 *	9.80134E-06 *	3.51514E-05	
TEG	7.34243E-13 *	6.68289E-16 *	6.68289E-16 *	1.79645E-06	
O2	0 *	0 *	0 *	0	
NO2	0 *	0 *	0 *	0	
N2O	0 *	0 *	0 *	0	
CO	0 *	0 *	0 *	0	
Other C-7's	0.00252813 *	0.00214382 *	0.00214382 *	0.000173555	
Other C-8's	0.00707107 *	0.00565475 *	0.00565475 *	0.000260391	
Other C-9's	0.0016368 *	0.00122197 *	0.00122197 *	2.02074E-05	
Other C-10's	0.000620678 *	0.000432772 *	0.000432772 *	1.51886E-06	
Undecanes Plus	0.000158309 *	0.000100123 *	0.000100123 *	2.44733E-09	

Mass Flow	Condensate Flashing Losses lb/h	Condensate Loading Losses lb/h	Condensate WB Losses lb/h	FUEL GAS lb/h	Produced Water Flashing Losses lb/h
H2S	0 *	0 *	0 *	0	0
N2	0.00085075 *	5.80535E-06 *	2.12151E-06 *	7.67864	0
CO2	0.0586473 *	0.00559456 *	0.00204448 *	3.30991	0
C1	1.02134 *	0.0267081 *	0.00976024 *	752.306	0
C2	22.8603 *	3.18836 *	1.16516 *	238.616	0
C3	98.0125 *	10.9548 *	4.00332 *	142.706	0
iC4	36.1556 *	3.69226 *	1.3493 *	22.3804	0
nC4	120.212 *	12.6823 *	4.63463 *	58.2402	0
2,2-Dimethylpropane	1.72582 *	0.163957 *	0.0599165 *	0.739108	0
iC5	40.1374 *	3.86133 *	1.41109 *	14.2361	0
nC5	53.788 *	5.09742 *	1.8628 *	18.1156	0
2,2-Dimethylbutane	0.813543 *	0.0763399 *	0.0278977 *	0.239027	0
Cyclopentane	0.0357492 *	0.00283266 *	0.00103517 *	0.0110393	0
2,3-Dimethylbutane	1.34414 *	0.125797 *	0.0459715 *	0.372182	0
2-Methylpentane	8.77087 *	0.791382 *	0.289203 *	2.39672	0
3-Methylpentane	5.14657 *	0.479394 *	0.17519 *	1.36553	0
nC6	12.9442 *	1.19657 *	0.437276 *	3.28507	0
Methylcyclopentane	1.49193 *	0.126635 *	0.0462775 *	0.374513	0

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:
Location:	Wells Meckley	
Flowsheet:	Conventional Production Facility	

Mass Flow	Condensate Flashing Losses lb/h	Condensate Loading Losses lb/h	Condensate WB Losses lb/h	FUEL GAS lb/h	Produced Water Flashing Losses lb/h
Benzene	0.180384 *	0.0107342 *	0.0039227 *	0.0447549	0
Cyclohexane	1.46604 *	0.108857 *	0.039781 *	0.351438	0
2-Methylhexane	2.98171 *	0.0765928 *	0.0279901 *	0.598114	0
3-Methylhexane	2.36661 *	0.213471 *	0.078011 *	0.453134	0
2,2,4-Trimethylpentane	0 *	0 *	0 *	0	0
Heptane	3.62153 *	0.314272 *	0.114848 *	0.634416	0
Methylcyclohexane	1.75685 *	0.159916 *	0.0584399 *	0.287347	0
Toluene	0.331363 *	0.0197138 *	0.00720423 *	0.0493241	0
Octane	0.842969 *	0.0687288 *	0.0251163 *	0.0617736	0
Ethylbenzene	0.126742 *	0.00795637 *	0.00290758 *	0.00774407	0
m-Xylene	0.132991 *	0.0109018 *	0.00398397 *	0.00729805	0
o-Xylene	0.180366 *	0.00960668 *	0.00351067 *	0.00797924	0
n-Nonane	0.172336 *	0.0135158 *	0.00493923 *	0.00239436	0
n-Decane	0.0382315 *	0.00271668 *	0.000992786 *	8.67822E-05	0
Water	4.8405 *	0.000430362 *	0.000157272 *	0.0446248	0
TEG	3.14777E-10 *	2.93436E-14 *	1.07233E-14 *	0.0022806	0
O2	0 *	0 *	0 *	0	0
NO2	0 *	0 *	0 *	0	0
N2O	0 *	0 *	0 *	0	0
CO	0 *	0 *	0 *	0	0
Other C-7's	1.08383 *	0.0941319 *	0.0343996 *	0.220329	0
Other C-8's	3.03143 *	0.248292 *	0.0907359 *	0.330568	0
Other C-9's	0.701711 *	0.053655 *	0.0196077 *	0.0256534	0
Other C-10's	0.26609 *	0.0190024 *	0.00694425 *	0.00192819	0
Undecanes Plus	0.0678685 *	0.00439624 *	0.00160657 *	3.1069E-06	0

Stream Properties

Property	Units	Condensate Flashing Losses	Condensate Loading Losses	Condensate WB Losses	FUEL GAS	Produced Water Flashing Losses
Temperature	°F	83.6918 *	83.6918 *	83.6918 *	27.6725	65.4861 *
Pressure	psig	-1.38463	1.69179	1.69179	120	
Mole Fraction Vapor		1 *	1 *	1 *	1	1 *
Mole Fraction Light Liquid		0	0	0	0	
Molecular Weight	lb/lbmol	54.4107	54.1305	54.1305	21.0221	
Mass Density	lb/ft^3	0.126756	0.15598	0.15598	0.5646	
Mass Flow	lb/h	428.709 *	43.9085 *	16.046 *	1269.5	0 *
Vapor Volumetric Flow	ft^3/h	3382.16	281.502	102.872	2248.5	
Liquid Volumetric Flow	gpm	421.672	35.0963	12.8256	280.333	
Std Vapor Volumetric Flow	MMSCFD	0.0717601	0.00738774	0.00269978	0.55 *	0
Std Liquid Volumetric Flow	sgpm	1.52039	0.159165	0.0581654	7.36077	0
Specific Gravity		1.87865	1.86898	1.86898	0.725836	
API Gravity						
Net Ideal Gas Heating Value	Btu/ft^3	2788.04	2809.58	2809.58	1149.58	
Net Liquid Heating Value	Btu/lb	19271.3	19535.1	19535.1	20689.3	
Gross Ideal Gas Heating Value	Btu/ft^3	3023.4	3046.08	3046.08	1267.08	
Gross Liquid Heating Value	Btu/lb	20912.4	21192.9	21192.9	22810.5	

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Connections

	Produced Water Loading Losses	Produced Water WB Losses	1	9	10
From Block	--	--	From Exp Coil	VLVE-101	VLVE-103
To Block	--	--	Marcellus GPUs	Water Tanks	Water Tanks

Stream Composition

Mole Fraction	Produced Water Loading Losses	Produced Water WB Losses	1	9	10
H2S	0 *	0 *	0	0	0
N2	0.000634797 *	0.000634797 *	0.00314306	9.43112E-07	1.89532E-08
CO2	0.0948017 *	0.0948017 *	0.00113883	1.06404E-05	9.6021E-07
C1	0.409711 *	0.409711 *	0.474103	0.000266065	1.27443E-05
C2	0.0965133 *	0.0965133 *	0.116291	7.78936E-05	1.59652E-05
C3	0.0162373 *	0.0162373 *	0.05004	1.96437E-05	1.19239E-05
iC4	0.000828303 *	0.000828303 *	0.00659031	1.415E-06	1.39327E-06
nC4	0.00527949 *	0.00527949 *	0.0187863	6.02726E-06	8.02232E-06
2,2-Dimethylpropane	8.69575E-06 *	8.69575E-06 *	0.000207434	2.36758E-08	3.18155E-08
iC5	0.000416187 *	0.000416187 *	0.00521087	7.49662E-07	1.17848E-06
nC5	0.000133325 *	0.000133325 *	0.00769848	5.10688E-07	1.00666E-06
2,2-Dimethylbutane	9.02723E-07 *	9.02723E-07 *	0.000119522	4.37411E-09	7.37748E-09
Cyclopentane	9.37815E-06 *	9.37815E-06 *	5.96919E-06	3.56798E-09	5.3675E-09
2,3-Dimethylbutane	7.1997E-06 *	7.1997E-06 *	0.000238273	1.57683E-08	2.44463E-08
2-Methylpentane	1.9908E-05 *	1.9908E-05 *	0.00163029	7.04779E-08	1.34814E-07
3-Methylpentane	7.8876E-05 *	7.8876E-05 *	0.0010532	1.07026E-07	1.86733E-07
nC6	1.83833E-05 *	1.83833E-05 *	0.00311744	8.30075E-08	1.56065E-07
Methylcyclopentane	8.20359E-05 *	8.20359E-05 *	0.000370768	6.15287E-08	9.86469E-08
Benzene	0.00198436 *	0.00198436 *	4.95184E-05	6.00349E-07	8.33246E-07
Cyclohexane	0.000328609 *	0.000328609 *	0.000430336	1.27444E-07	1.94226E-07
2-Methylhexane	3.0668E-06 *	3.0668E-06 *	0.00117441	1.47669E-08	2.21592E-08
3-Methylhexane	3.29836E-06 *	3.29836E-06 *	0.00102405	1.35965E-08	1.94667E-08
2,2,4-Trimethylpentane	0 *	0 *	0	0	0
Heptane	2.19423E-06 *	2.19423E-06 *	0.00199669	1.46984E-08	2.55617E-08
Methylcyclohexane	7.24603E-05 *	7.24603E-05 *	0.00101881	6.1013E-08	9.65361E-08
Toluene	0.00316653 *	0.00316653 *	0.000217015	8.42907E-07	1.1605E-06
Octane	6.86279E-08 *	6.86279E-08 *	0.00119	1.27823E-09	2.64889E-09
Ethylbenzene	0.000953338 *	0.000953338 *	0.000209929	2.41798E-07	3.16121E-07
m-Xylene	0.00110185 *	0.00110185 *	0.000242698	2.03311E-07	2.90822E-07
o-Xylene	0.00153818 *	0.00153818 *	0.000379659	5.60105E-07	7.3921E-07
n-Nonane	9.10973E-09 *	9.10973E-09 *	0.000668871	1.85395E-10	2.98594E-10
n-Decane	1.89166E-10 *	1.89166E-10 *	0.000389709	1.26193E-11	2.39484E-11
Water	0.364767 *	0.364767 *	0.291416	0.999613	0.999942
TEG	7.04442E-16 *	7.04442E-16 *	0	0	2.98851E-08
O2	0 *	0 *	0	0	0
NO2	0 *	0 *	0	0	0
N2O	0 *	0 *	0	0	0
CO	0 n	0 *	0	0	0
Other C-7's	5.10548E-05 *	5.10548E-05 *	0.000432955	3.93015E-08	6.13845E-08
Other C-8's	0.000382466 *	0.000382466 *	0.00278165	1.77982E-07	2.59937E-07
Other C-9's	0.000335542 *	0.000335542 *	0.00164744	8.20606E-08	1.14197E-07
Other C-10's	0.000382848 *	0.000382848 *	0.00158564	5.69617E-08	7.77951E-08
Undecanes Plus	0.000146277 *	0.000146277 *	0.00339907	2.09572E-08	2.92437E-08

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Molar Flow	Produced Water Loading Losses lbmol/h	Produced Water WB Losses lbmol/h	1 lbmol/h	9 lbmol/h	10 lbmol/h
H2S	0 *	0 *	0	0	0
N2	3.80452E-05 *	1.02823E-05 *	15.9468	0.00136942	4.45531E-07
CO2	0.00568174 *	0.00153558 *	5.77806	0.0154501	2.25716E-05
C1	0.0245552 *	0.00663642 *	2405.44	0.386333	0.000299579
C2	0.00578432 *	0.00156331 *	590.023	0.113103	0.000375292
C3	0.000973151 *	0.00026301 *	253.886	0.0285232	0.000280294
iC4	4.96426E-05 *	1.34167E-05 *	33.437	0.00205461	3.27515E-05
nC4	0.000316415 *	8.55163E-05 *	95.3153	0.00875174	0.00018858
2,2-Dimethylpropane	5.21162E-07 *	1.40852E-07 *	1.05245	3.43778E-05	7.47885E-07
iC5	2.49433E-05 *	6.74133E-06 *	26.4382	0.00108853	2.77025E-05
nC5	7.99053E-06 *	2.15957E-06 *	39.0595	0.000741532	2.36636E-05
2,2-Dimethylbutane	5.41028E-08 *	1.46222E-08 *	0.606416	6.35132E-06	1.73422E-07
Cyclopentane	5.6206E-07 *	1.51906E-07 *	0.0302857	5.1808E-06	1.26174E-07
2,3-Dimethylbutane	4.31499E-07 *	1.16619E-07 *	1.20892	2.28959E-05	5.74659E-07
2-Methylpentane	1.19314E-06 *	3.22466E-07 *	8.27153	0.000102336	3.16906E-06
3-Methylpentane	4.72727E-06 *	1.27762E-06 *	5.3436	0.000155404	4.38953E-06
nC6	1.10176E-06 *	2.97769E-07 *	15.8168	0.000120529	3.66861E-06
Methylcyclopentane	4.91665E-06 *	1.3288E-06 *	1.88115	8.93412E-05	2.31889E-06
Benzene	0.000118929 *	3.21423E-05 *	0.25124	0.000871723	1.95871E-05
Cyclohexane	1.96945E-05 *	5.32275E-06 *	2.18338	0.000185051	4.56567E-06
2-Methylhexane	1.83803E-07 *	4.96756E-08 *	5.95855	2.14419E-05	5.20896E-07
3-Methylhexane	1.9768E-07 *	5.34262E-08 *	5.19567	1.97425E-05	4.57603E-07
2,2,4-Trimethylpentane	0 *	0 *	0	0	0
Heptane	1.31507E-07 *	3.55418E-08 *	10.1305	2.13425E-05	6.00878E-07
Methylcyclohexane	4.34276E-06 *	1.1737E-06 *	5.16909	8.85925E-05	2.26927E-06
Toluene	0.00018978 *	5.1291E-05 *	1.10106	0.00122392	2.72799E-05
Octane	4.11307E-09 *	1.11162E-09 *	6.03766	1.85602E-06	6.22673E-08
Ethylbenzene	5.71363E-05 *	1.5442E-05 *	1.06511	0.000351097	7.43105E-06
m-Xylene	6.60369E-05 *	1.78475E-05 *	1.23137	0.000295213	6.83635E-06
o-Xylene	9.21879E-05 *	2.49153E-05 *	1.92626	0.000813286	1.73766E-05
n-Nonane	5.45973E-10 *	1.47558E-10 *	3.39362	2.69198E-07	7.01903E-09
n-Decane	1.13373E-11 *	3.06408E-12 *	1.97725	1.83236E-08	5.62954E-10
Water	0.0218616 *	0.00590844 *	1478.55	1451.46	23.5056
TEG	4.22192E-17 *	1.14104E-17 *	0	0	7.02509E-07
O2	0 *	0 *	0	0	0
NO2	0 *	0 *	0	0	0
N2O	0 *	0 *	0	0	0
CO	0 *	0 *	0	0	0
Other C-7's	3.05986E-06 *	8.26976E-07 *	2.19667	5.70668E-05	1.44296E-06
Other C-8's	2.29223E-05 *	6.19511E-06 *	14.1131	0.000258435	6.11034E-06
Other C-9's	2.011E-05 *	5.43505E-06 *	8.35855	0.000119154	2.68443E-06
Other C-10's	2.29452E-05 *	6.20131E-06 *	8.04499	8.27099E-05	1.82873E-06
Undecanes Plus	8.76682E-06 *	2.36937E-06 *	17.2457	3.04304E-05	6.87431E-07

Mass Fraction	Produced Water Loading Losses	Produced Water WB Losses	1	9	10
H2S	0 *	0 *	0	0	0
N2	0.000794159 *	0.000794159 *	0.00367813	1.46637E-06	2.94695E-08
CO2	0.186324 *	0.186324 *	0.0020937	2.59907E-05	2.34552E-06
C1	0.293532 *	0.293532 *	0.317725	0.000236904	1.13478E-05
C2	0.129602 *	0.129602 *	0.146075	0.000129998	2.66452E-05
C3	0.0319755 *	0.0319755 *	0.0921765	4.80766E-05	2.91836E-05
iC4	0.00215 *	0.00215 *	0.0160013	4.5647E-06	4.49472E-06
nC4	0.0137038 *	0.0137038 *	0.0456132	1.94436E-05	2.58802E-05
2,2-Dimethylpropane	2.80184E-05 *	2.80184E-05 *	0.000625196	9.48087E-08	1.27407E-07

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Mass Fraction	Produced Water Loading Losses	Produced Water WB Losses	1	9	10
iC5	0.00134099 *	0.00134099 *	0.0157053	3.00199E-06	4.71929E-06
nC5	0.000429582 *	0.000429582 *	0.0232029	2.04503E-06	4.03124E-06
2,2-Dimethylbutane	3.47412E-06 *	3.47412E-06 *	0.000430269	2.09212E-08	3.52871E-08
Cyclopentane	2.93728E-05 *	2.93728E-05 *	1.74882E-05	1.38886E-08	2.08939E-08
2,3-Dimethylbutane	2.77079E-05 *	2.77079E-05 *	0.000857759	7.54192E-08	1.16929E-07
2-Methylpentane	7.66155E-05 *	7.66155E-05 *	0.00586888	3.37094E-07	6.44826E-07
3-Methylpentane	0.000303553 *	0.000303553 *	0.00379143	5.11902E-07	8.93162E-07
nC6	7.07477E-05 *	7.07477E-05 *	0.0112225	3.97023E-07	7.46473E-07
Methylcyclopentane	0.000308328 *	0.000308328 *	0.0013035	2.87406E-07	4.608E-07
Benzene	0.0069222 *	0.0069222 *	0.000161581	2.60277E-06	3.61257E-06
Cyclohexane	0.00123506 *	0.00123506 *	0.00151293	5.953E-07	9.07271E-07
2-Methylhexane	1.37236E-05 *	1.37236E-05 *	0.0049159	8.21259E-08	1.23241E-07
3-Methylhexane	1.47598E-05 *	1.47598E-05 *	0.00428651	7.56167E-08	1.08267E-07
2,2,4-Trimethylpentane	0 *	0 *	0	0	0
Heptane	9.81895E-06 *	9.81895E-06 *	0.00835783	8.1745E-08	1.42165E-07
Methylcyclohexane	0.000317729 *	0.000317729 *	0.00417878	3.32496E-07	5.26096E-07
Toluene	0.0130296 *	0.0130296 *	0.000835293	4.31057E-06	5.9349E-06
Octane	3.50092E-07 *	3.50092E-07 *	0.00567844	8.10395E-09	1.67944E-08
Ethylbenzene	0.00451996 *	0.00451996 *	0.000931027	1.42478E-06	1.86278E-06
m-Xylene	0.00522407 *	0.00522407 *	0.00107635	1.198E-06	1.7137E-06
o-Xylene	0.00729284 *	0.00729284 *	0.00168377	3.30039E-06	4.35587E-06
n-Nonane	5.21779E-08 *	5.21779E-08 *	0.00358364	1.31973E-09	2.1256E-09
n-Decane	1.20198E-09 *	1.20198E-09 *	0.00231631	9.96553E-11	1.89126E-10
Water	0.29347 *	0.29347 *	0.219312	0.99951	0.999865
TEG	4.72436E-15 *	4.72436E-15 *	0	0	2.49099E-07
O2	0 *	0 *	0	0	0
NO2	0 *	0 *	0	0	0
N2O	0 *	0 *	0	0	0
CO	0 *	0 *	0	0	0
Other C-7's	0.000217379 *	0.000217379 *	0.00172435	2.07969E-07	3.24833E-07
Other C-8's	0.00185254 *	0.00185254 *	0.0126032	1.07142E-06	1.56482E-06
Other C-9's	0.00182081 *	0.00182081 *	0.00836236	5.53428E-07	7.70181E-07
Other C-10's	0.00229107 *	0.00229107 *	0.00887598	4.23645E-07	5.78606E-07
Undecanes Plus	0.00106807 *	0.00106807 *	0.0232159	1.9018E-07	2.65385E-07

Mass Flow	Produced Water Loading Losses lb/h	Produced Water WB Losses lb/h	1 lb/h	9 lb/h	10 lb/h
H2S	0 *	0 *	0	0	0
N2	0.00106578 *	0.000288043 *	446.725	0.0383622	1.24808E-05
CO2	0.250051 *	0.0675802 *	254.29	0.679952	0.000993366
C1	0.393925 *	0.106465 *	38589.2	6.19773	0.00480598
C2	0.173929 *	0.0470071 *	17741.4	3.40091	0.0112847
C3	0.0429117 *	0.0115976 *	11195.3	1.25775	0.0123597
iC4	0.00288534 *	0.000779809 *	1943.43	0.119419	0.00190359
nC4	0.0183907 *	0.00497039 *	5539.93	0.50867	0.0109607
2,2-Dimethylpropane	3.76012E-05 *	1.01623E-05 *	75.9329	0.00248032	5.3959E-05
iC5	0.00179963 *	0.000486379 *	1907.48	0.078536	0.0019987
nC5	0.000576507 *	0.00015581 *	2818.09	0.0535006	0.0017073
2,2-Dimethylbutane	4.66233E-06 *	1.26007E-06 *	52.2581	0.000547327	1.49447E-05
Cyclopentane	3.94189E-05 *	1.06536E-05 *	2.12402	0.000363345	8.84892E-06
2,3-Dimethylbutane	3.71846E-05 *	1.00497E-05 *	104.179	0.00197307	4.95214E-05
2-Methylpentane	0.00010282 *	2.77886E-05 *	712.802	0.00881882	0.000273095
3-Methylpentane	0.000407374 *	0.000110099 *	460.486	0.013392	0.000378269
nC6	9.49448E-05 *	2.56604E-05 *	1363.02	0.0103866	0.000316144
Methylcyclopentane	0.000413783 *	0.000111831 *	158.317	0.00751891	0.000195156

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Mass Flow	Produced Water Loading Losses lb/h	Produced Water WB Losses lb/h	1 lb/h	9 lb/h	10 lb/h
Benzene	0.00928973 *	0.0025107 *	19.6248	0.0680919	0.00152998
Cyclohexane	0.00165748 *	0.00044796 *	183.752	0.0155738	0.000384245
2-Methylhexane	1.84174E-05 *	4.97759E-06 *	597.058	0.00214852	5.21948E-05
3-Methylhexane	1.98079E-05 *	5.35341E-06 *	520.616	0.00197823	4.58527E-05
2,2,4-Trimethylpentane	0 *	0 *	0	0	0
Heptane	1.31772E-05 *	3.56135E-06 *	1015.1	0.00213856	6.02091E-05
Methylcyclohexane	0.000426398 *	0.000115241 *	507.532	0.00869854	0.000222811
Toluene	0.017486 *	0.00472587 *	101.45	0.11277	0.00251353
Octane	4.6983E-07 *	1.26979E-07 *	689.673	0.00021201	7.1127E-06
Ethylbenzene	0.00606588 *	0.0016394 *	113.078	0.0372742	0.000788917
m-Xylene	0.00701081 *	0.00189478 *	130.728	0.0313413	0.000725781
o-Xylene	0.00978713 *	0.00264513 *	204.502	0.0863425	0.00184479
n-Nonane	7.00238E-08 *	1.8925E-08 *	435.25	3.4526E-05	9.00226E-07
n-Decane	1.61308E-09 *	4.35962E-10 *	281.327	2.60711E-06	8.0098E-08
Water	0.393842 *	0.106442 *	26636.5	26148.5	423.46
TEG	6.34019E-15 *	1.71354E-15 *	0	0	0.000105498
O2	0 *	0 *	0	0	0
NO2	0 *	0 *	0	0	0
N2O	0 *	0 *	0	0	0
CO	0 *	0 *	0	0	0
Other C-7's	0.000291727 *	7.88439E-05 *	209.43	0.00544075	0.000137572
Other C-8's	0.00248615 *	0.000671922 *	1530.71	0.0280299	0.000662727
Other C-9's	0.00244357 *	0.000660413 *	1015.65	0.0144784	0.000326185
Other C-10's	0.00307466 *	0.000830976 *	1078.03	0.0110831	0.000245049
Undecanes Plus	0.00143337 *	0.000387392 *	2819.68	0.00497537	0.000112395

Stream Properties

Property	Units	Produced Water Loading Losses	Produced Water WB Losses	1	9	10
Temperature	°F	65.4861 *	65.4861 *	100	101.223	130.242
Pressure	psig	-13.8398	-13.8398	268.021	0.2	0.2 *
Mole Fraction Vapor		1 *	1 *	0.670624	0.000385565	4.64043E-05
Mole Fraction Light Liquid		0	0	0.0402896	0.999614	0.999954
Molecular Weight	lb/lbmol	22.392	22.392	23.9382	18.0171	18.0167
Mass Density	lb/ft^3	0.00340285	0.00340285	1.77608	40.3885	57.6674
Mass Flow	lb/h	1.34202 *	0.362702 *	121455	26161.3	423.517
Vapor Volumetric Flow	ft^3/h	394.381	106.588	68383.5	647.741	7.34413
Liquid Volumetric Flow	gpm	49.1696	13.2889	8525.73	80.7574	0.915632
Std Vapor Volumetric Flow	MMSCFD	0.000545846	0.000147524	46.209	13.2245	0.214092
Std Liquid Volumetric Flow	sgpm	0.00540115	0.00145975	535.965	52.3436	0.846756
Specific Gravity		0.773136	0.773136			
API Gravity						
Net Ideal Gas Heating Value	Btu/ft^3	636.171	636.171	1001.59	0.456205	0.123801
Net Liquid Heating Value	Btu/lb	10420.8	10420.8	15570.2	-1049.67	-1057.03
Gross Ideal Gas Heating Value	Btu/ft^3	717.858	717.858	1112.19	50.7924	50.4413
Gross Liquid Heating Value	Btu/lb	11805.2	11805.2	17323.3	10.5317	2.80654

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Connections

	11	12	14	15	16
From Block	Water Tanks	Water Tanks	VLVE-107	Oil Tanks	Oil Tanks
To Block	MIX-104	--	Oil Tanks	--	MIX-104

Stream Composition

Mole Fraction	11	12	14	15	16
H2S	0	0	0	0	0
N2	0.00239896	2.7364E-08	1.74994E-07	9.41139E-09	5.41189E-06
CO2	0.0094039	4.08659E-06	9.39856E-06	2.84678E-06	0.000216612
C1	0.772934	1.76613E-05	0.000390061	5.44673E-05	0.0110039
C2	0.127068	4.16037E-06	0.00677122	0.0033757	0.114162
C3	0.0315633	6.99938E-07	0.0385972	0.0305912	0.291803
iC4	0.00230564	3.57054E-08	0.0217052	0.0199747	0.0764361
nC4	0.00972544	2.27581E-07	0.101946	0.0972871	0.2493
2,2-Dimethylpropane	3.9254E-05	3.74845E-10	0.0014723	0.00142848	0.00285828
iC5	0.00123537	1.79405E-08	0.0621863	0.0620877	0.065306
nC5	0.000860082	5.74718E-09	0.108859	0.109549	0.0870398
2,2-Dimethylbutane	7.35394E-06	3.89134E-11	0.0021637	0.0021975	0.00109477
Cyclopentane	5.23743E-06	4.04261E-10	9.96885E-05	0.000100966	5.92848E-05
2,3-Dimethylbutane	2.61116E-05	3.10355E-10	0.00482204	0.00491751	0.00180237
2-Methylpentane	0.000118457	8.58167E-10	0.0337262	0.034421	0.0117516
3-Methylpentane	0.000175194	3.40008E-09	0.0226765	0.0231758	0.00688538
nC6	0.000139885	7.92442E-10	0.07082	0.072513	0.017276
Methylcyclopentane	9.73835E-05	3.5363E-09	0.00844946	0.00865205	0.0020421
Benzene	0.000157055	4.30742E-07	0.00111841	0.00114536	0.000266158
Cyclohexane	0.000187636	1.41652E-08	0.0102274	0.0104875	0.00200406
2-Methylhexane	2.47523E-05	1.322E-10	0.0302333	0.0310814	0.0034078
3-Methylhexane	2.27251E-05	1.42181E-10	0.0266506	0.0274078	0.00270248
2,2,4-Trimethylpentane	0	0	0	0	0
Heptane	2.4807E-05	9.4586E-11	0.0530257	0.0545716	0.00413168
Methylcyclohexane	9.72604E-05	3.12353E-09	0.0271862	0.0279811	0.00204622
Toluene	0.000259752	5.84486E-07	0.00579985	0.00597023	0.000411402
Octane	2.17911E-06	2.95832E-12	0.0330257	0.0340434	0.000839215
Ethylbenzene	8.6911E-05	1.60304E-07	0.00583099	0.00601106	0.000135882
m-Xylene	9.03683E-05	1.26457E-07	0.00675028	0.00695921	0.000142554
o-Xylene	0.000137925	4.02458E-07	0.0105731	0.0109013	0.000193246
n-Nonane	3.13801E-07	3.9269E-13	0.0187098	0.0192966	0.000151856
n-Decane	2.14928E-08	8.15432E-15	0.0109094	0.0112534	3.02828E-05
Water	0.0402838	0.999971	0.00226925	0.00110527	0.0390826
TEG	3.40887E-16	3.98959E-10	1.16388E-10	1.20062E-10	1.89652E-13
O2	0	0	0	0	0
NO2	0	0	0	0	0
N2O	0	0	0	0	0
CO	0	0	0	0	0
Other C-7's	6.22428E-05	2.2008E-09	0.0110951	0.0114047	0.00130193
Other C-8's	0.000268264	1.64868E-08	0.0763785	0.0786928	0.00318411
Other C-9's	0.000109715	1.44641E-08	0.0459845	0.0474178	0.000655118
Other C-10's	6.309E-05	1.65033E-08	0.0443751	0.0457711	0.000224387
Undecanes Plus	1.85669E-05	8.38819E-09	0.0951619	0.0981693	4.64923E-05

Molar Flow	11 lbmol/h	12 lbmol/h	14 lbmol/h	15 lbmol/h	16 lbmol/h
H2S	0	0	0	0	0
N2	0.0021065	4.83276E-05	3.17132E-05	1.6533E-06	3.00599E-05
CO2	0.00825747	0.00721733	0.00170325	0.000500094	0.00120316
C1	0.678705	0.0311916	0.0706886	0.00956828	0.0611203
C2	0.111577	0.00734763	1.22711	0.593009	0.634102
C3	0.0277154	0.00123616	6.99476	5.37396	1.6208
iC4	0.00202456	6.30593E-05	3.93352	3.50896	0.424559
nC4	0.00853981	0.000401931	18.4751	17.0904	1.38472

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Molar Flow	11 lbmol/h	12 lbmol/h	14 lbmol/h	15 lbmol/h	16 lbmol/h
2,2-Dimethylpropane	3.44685E-05	6.62014E-07	0.266817	0.250941	0.0158761
iC5	0.00108477	3.16846E-05	11.2697	10.907	0.362737
nC5	0.000755229	1.01501E-05	19.7279	19.2445	0.483456
2,2-Dimethylbutane	6.45741E-06	6.8725E-08	0.392116	0.386035	0.0060808
Cyclopentane	4.59893E-06	7.13966E-07	0.018066	0.0177367	0.000329293
2,3-Dimethylbutane	2.29283E-05	5.48118E-07	0.873871	0.86386	0.0100111
2-Methylpentane	0.000104015	1.51561E-06	6.11202	6.04675	0.0652735
3-Methylpentane	0.000153836	6.00489E-06	4.10954	4.0713	0.0382443
nC6	0.000122832	1.39953E-06	12.8343	12.7384	0.0959583
Methylcyclopentane	8.55115E-05	6.24545E-06	1.53125	1.51991	0.0113427
Benzene	0.000137908	0.000760734	0.202684	0.201206	0.00147836
Cyclohexane	0.000164762	2.50172E-05	1.85346	1.84233	0.0111314
2-Methylhexane	2.17347E-05	2.33478E-07	5.47901	5.46008	0.0189284
3-Methylhexane	1.99547E-05	2.51106E-07	4.82974	4.81473	0.0150107
2,2,4-Trimethylpentane	0	0	0	0	0
Heptane	2.17828E-05	1.67048E-07	9.60955	9.58661	0.0229491
Methylcyclohexane	8.54033E-05	5.51646E-06	4.92681	4.91544	0.0113656
Toluene	0.000228085	0.00103226	1.05108	1.04879	0.0022851
Octane	1.91345E-06	5.22469E-09	5.98506	5.9804	0.00466136
Ethylbenzene	7.63157E-05	0.000283112	1.05672	1.05596	0.000754748
m-Xylene	7.93515E-05	0.000223336	1.22332	1.22252	0.000791805
o-Xylene	0.00012111	0.000710781	1.91611	1.91504	0.00107337
n-Nonane	2.75545E-07	6.9353E-10	3.39068	3.38983	0.000843474
n-Decane	1.88726E-08	1.44013E-11	1.97705	1.97688	0.000168203
Water	0.0353728	1766.05	0.411244	0.194162	0.217082
TEG	2.9933E-16	7.04602E-07	2.10924E-08	2.10914E-08	1.05341E-12
O2	0	0	0	0	0
NO2	0	0	0	0	0
N2O	0	0	0	0	0
CO	0	0	0	0	0
Other C-7's	5.46547E-05	3.88684E-06	2.0107	2.00347	0.00723146
Other C-8's	0.000235559	2.91174E-05	13.8417	13.824	0.0176859
Other C-9's	9.63396E-05	2.55451E-05	8.33352	8.32989	0.0036388
Other C-10's	5.53986E-05	2.91465E-05	8.04185	8.04061	0.00124634
Undecanes Plus	1.63034E-05	1.48144E-05	17.2457	17.2454	0.000258238

Mass Fraction	11	12	14	15	16
H2S	0	0	0	0	0
N2	0.00337981	4.25498E-08	5.12499E-08	2.718E-09	2.85767E-06
CO2	0.0208142	9.98296E-06	4.32425E-06	1.29161E-06	0.000179691
C1	0.623616	1.5727E-05	6.54194E-05	9.00818E-06	0.00332748
C2	0.192158	6.9439E-06	0.00212858	0.00104644	0.064705
C3	0.0699975	1.7132E-06	0.0177932	0.0139066	0.24254
iC4	0.00673967	1.15194E-07	0.0131889	0.0119689	0.0837411
nC4	0.0284286	7.34228E-07	0.0619464	0.0582945	0.273126
2,2-Dimethylpropane	0.000142435	1.50118E-09	0.00111053	0.00106251	0.00388715
iC5	0.00448261	7.1848E-08	0.0469059	0.0461812	0.0888137
nC5	0.00312085	2.30163E-08	0.0821101	0.0814831	0.118371
2,2-Dimethylbutane	3.18718E-05	1.86138E-10	0.00194932	0.00195228	0.00177829
Cyclopentane	1.84733E-05	1.57375E-09	7.30921E-05	7.30007E-05	7.83723E-05
2,3-Dimethylbutane	0.000113167	1.48455E-09	0.00434427	0.00436877	0.00292769
2-Methylpentane	0.000513389	4.10494E-09	0.0303847	0.03058	0.0190888
3-Methylpentane	0.000759287	1.62639E-08	0.0204297	0.0205896	0.0111843
nC6	0.000606261	3.79055E-09	0.0638032	0.0644213	0.0280624
Methylcyclopentane	0.000412185	1.65198E-08	0.00743421	0.00750675	0.00323949
Benzene	0.000616982	1.86761E-06	0.00091332	0.000922338	0.000391881
Cyclohexane	0.00079419	6.61728E-08	0.00899857	0.00909921	0.00317915
2-Methylhexane	0.000124737	7.3529E-10	0.0316712	0.0321076	0.00643648
3-Methylhexane	0.000114521	7.90807E-10	0.0279181	0.0283126	0.00510431
2,2,4-Trimethylpentane	0	0	0	0	0

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Mass Fraction	11	12	14	15	16
Heptane	0.000125013	5.26084E-10	0.0555477	0.0563733	0.0078037
Methylcyclohexane	0.000480275	1.70234E-08	0.0279063	0.0283234	0.00378705
Toluene	0.00120366	2.98928E-06	0.00558677	0.00567103	0.000714504
Octane	1.25186E-05	1.87574E-11	0.0394393	0.0400901	0.00180695
Ethylbenzene	0.000464045	9.44662E-07	0.00647183	0.00657905	0.000271921
m-Xylene	0.000482505	7.45206E-07	0.00749215	0.00761678	0.000285271
o-Xylene	0.000736425	2.37167E-06	0.0117351	0.0119314	0.000386714
n-Nonane	2.0241E-06	2.79561E-12	0.0250869	0.0255144	0.000367118
n-Decane	1.53797E-07	6.44004E-14	0.0162275	0.0165067	8.12162E-05
Water	0.0364985	0.999955	0.000427392	0.000205276	0.0132716
TEG	2.57458E-15	3.32562E-09	1.82728E-10	1.85878E-10	5.36841E-13
O2	0	0	0	0	0
NO2	0	0	0	0	0
N2O	0	0	0	0	0
CO	0	0	0	0	0
Other C-7's	0.000298448	1.16468E-08	0.0110588	0.0112096	0.0023397
Other C-8's	0.00146331	9.92565E-08	0.0866052	0.0879903	0.00650962
Other C-9's	0.000670474	9.75564E-08	0.0584154	0.0593996	0.00150048
Other C-10's	0.000425176	1.22752E-07	0.0621652	0.0632304	0.000566762
Undecanes Plus	0.000152673	7.61269E-08	0.162661	0.165472	0.000143283

Mass Flow	11 lb/h	12 lb/h	14 lb/h	15 lb/h	16 lb/h
H2S	0	0	0	0	0
N2	0.0590102	0.00135382	0.000888396	4.63145E-05	0.000842081
CO2	0.363407	0.317631	0.0749592	0.0220089	0.0529503
C1	10.8881	0.50039	1.13402	0.153499	0.98052
C2	3.355	0.220936	36.8981	17.8312	19.0669
C3	1.22213	0.0545093	308.438	236.968	71.47
iC4	0.117672	0.00366515	228.625	203.949	24.6763
nC4	0.496353	0.0233611	1073.82	993.333	80.483
2,2-Dimethylpropane	0.00248686	4.77635E-05	19.2505	18.1051	1.14544
iC5	0.0782646	0.00228601	813.094	786.923	26.1711
nC5	0.0544888	0.000732317	1423.35	1388.47	34.8807
2,2-Dimethylbutane	0.00055647	5.9224E-06	33.7907	33.2667	0.524015
Cyclopentane	0.000322536	5.00725E-05	1.26702	1.24393	0.0230943
2,3-Dimethylbutane	0.00197586	4.72343E-05	75.3062	74.4434	0.862713
2-Methylpentane	0.00896357	0.000130608	526.706	521.081	5.62497
3-Methylpentane	0.0132569	0.000517473	354.141	350.846	3.29572
nC6	0.0105851	0.000120605	1106	1097.73	8.26924
Methylcyclopentane	0.0071966	0.000525614	128.869	127.914	0.954594
Benzene	0.0107723	0.0594223	15.832	15.7166	0.115477
Cyclohexane	0.0138663	0.00210544	155.987	155.05	0.936811
2-Methylhexane	0.00217786	2.3395E-05	549.007	547.111	1.89666
3-Methylhexane	0.0019995	2.51614E-05	483.949	482.445	1.5041
2,2,4-Trimethylpentane	0	0	0	0	0
Heptane	0.00218268	1.67386E-05	962.896	960.596	2.29955
Methylcyclohexane	0.00838542	0.000541639	483.744	482.628	1.11594
Toluene	0.0210154	0.0951109	96.8444	96.6339	0.210545
Octane	0.000218571	5.96809E-07	683.665	683.133	0.53246
Ethylbenzene	0.00810205	0.0300566	112.187	112.106	0.0801279
m-Xylene	0.00842435	0.0237104	129.873	129.789	0.084062
o-Xylene	0.0128577	0.0754601	203.424	203.31	0.113954
n-Nonane	3.53401E-05	8.89488E-08	434.872	434.764	0.10818
n-Decane	2.68523E-06	2.04905E-09	281.298	281.274	0.0239323
Water	0.63725	31815.9	7.40867	3.49789	3.91078
TEG	4.49512E-14	0.000105812	3.16751E-06	3.16735E-06	1.58193E-10
O2	0	0	0	0	0
NO2	0	0	0	0	0
N2O	0	0	0	0	0
CO	0	0	0	0	0

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Mass Flow	11 lb/h	12 lb/h	14 lb/h	15 lb/h	16 lb/h
Other C-7's	0.00521078	0.000370571	191.701	191.011	0.689447
Other C-8's	0.0255488	0.00315807	1501.27	1499.35	1.91821
Other C-9's	0.0117062	0.00310398	1012.61	1012.16	0.442151
Other C-10's	0.00742342	0.00390564	1077.61	1077.44	0.16701
Undecanes Plus	0.00266561	0.00242215	2819.67	2819.62	0.0422219

Stream Properties

Property	Units	11	12	14	15	16
Temperature	°F	85 *	85	86.4002	85	85 *
Pressure	psig	0.2 *	0.2	0.5	0.5	0.5 *
Mole Fraction Vapor		1	0	0.0343204	0	1
Mole Fraction Light Liquid		0	1	0.96568	0.999883	0
Molecular Weight	lb/lbmol	19.8836	18.0156	95.6526	96.9996	53.0521
Mass Density	lb/ft^3	0.0508115	62.1272	6.33323	43.5072	0.140986
Mass Flow	lb/h	17.4596	31817.3	17334.6	17039.9	294.674
Vapor Volumetric Flow	ft^3/h	343.615	512.132	2737.09	391.657	2090.1
Liquid Volumetric Flow	gpm	42.8404	63.8502	341.247	48.83	260.583
Std Vapor Volumetric Flow	MMSCFD	0.0079973	16.085	1.65052	1.59994	0.0505876
Std Liquid Volumetric Flow	sgpm	0.101569	63.6086	49.4277	48.371	1.0567
Specific Gravity		0.686528	0.996122		0.697577	1.83174
API Gravity			10.0024		67.7535	
Net Ideal Gas Heating Value	Btu/ft^3	1036.16	0.0332463	4822.93	4889.56	2715.65
Net Liquid Heating Value	Btu/lb	19686.3	-1059.02	18952.3	18947.2	19250.3
Gross Ideal Gas Heating Value	Btu/ft^3	1145.79	50.3449	5184.62	5255.4	2945.92
Gross Liquid Heating Value	Btu/lb	21778.7	0.759763	20385.4	20376.6	20897

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Connections

	59	72			
From Block	condDEHY	VLVE-118			
To Block	Water Tanks	Water Tanks			

Stream Composition

Mole Fraction	59	72			
H2S	0	0			
N2	3.71907E-08	2.72676E-06			
CO2	5.81148E-07	0			
C1	1.25384E-05	0.00112298			
C2	2.99293E-06	1.88821E-05			
C3	9.4365E-07	5.02659E-07			
iC4	7.1558E-08	0			
nC4	3.93602E-07	0			
2,2-Dimethylpropane	1.3278E-09	0			
iC5	6.08062E-08	0			
nC5	5.05601E-08	0			
2,2-Dimethylbutane	3.8525E-10	0			
Cyclopentane	1.63408E-09	0			
2,3-Dimethylbutane	1.60957E-09	0			
2-Methylpentane	7.2718E-09	0			
3-Methylpentane	1.2911E-08	0			
nC6	9.34246E-09	0			
Methylcyclopentane	2.67269E-08	0			
Benzene	2.02398E-06	0			
Cyclohexane	4.46897E-08	0			
2-Methylhexane	1.48579E-09	0			
3-Methylhexane	1.57635E-09	0			
2,2,4-Trimethylpentane	0	0			
Heptane	1.78944E-09	0			
Methylcyclohexane	1.60221E-08	0			
Toluene	2.52406E-06	0			
Octane	1.0818E-10	0			
Ethylbenzene	2.48428E-07	0			
m-Xylene	1.75987E-07	0			
o-Xylene	3.39213E-07	0			
n-Nonane	5.99355E-12	0			
n-Decane	1.32574E-13	0			
Water	0.999977	0.998855			
TEG	5.77682E-10	0			
O2	0	0			
NO2	0	0			
N2O	0	0			
CO	0	0			
Other C-7's	8.79238E-09	0			
Other C-8's	3.63278E-08	0			
Other C-9's	1.27341E-08	0			
Other C-10's	1.8128E-09	0			
Undecanes Plus	6.36762E-14	0			

Molar Flow	59 lbmol/h	72 lbmol/h			
H2S	0	0			
N2	1.34731E-07	0.000784824			
CO2	2.10533E-06	0			
C1	4.5423E-05	0.323219			
C2	1.08425E-05	0.00543471			
C3	3.41857E-06	0.000144677			
iC4	2.59234E-07	0			
nC4	1.42591E-06	0			

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Molar Flow	59 lbmol/h	72 lbmol/h			
2,2-Dimethylpropane	4.81023E-09	0			
iC5	2.20284E-07	0			
nC5	1.83165E-07	0			
2,2-Dimethylbutane	1.39565E-09	0			
Cyclopentane	5.9198E-09	0			
2,3-Dimethylbutane	5.831E-09	0			
2-Methylpentane	2.63436E-08	0			
3-Methylpentane	4.67729E-08	0			
nC6	3.38451E-08	0			
Methylcyclopentane	9.68239E-08	0			
Benzene	7.33232E-06	0			
Cyclohexane	1.61898E-07	0			
2-Methylhexane	5.3826E-09	0			
3-Methylhexane	5.71066E-09	0			
2,2,4-Trimethylpentane	0	0			
Heptane	6.48263E-09	0			
Methylcyclohexane	5.80434E-08	0			
Toluene	9.14396E-06	0			
Octane	3.91904E-10	0			
Ethylbenzene	8.99983E-07	0			
m-Xylene	6.37552E-07	0			
o-Xylene	1.22887E-06	0			
n-Nonane	2.17129E-11	0			
n-Decane	4.80279E-13	0			
Water	3.62263	287.494			
TEG	2.09278E-09	0			
O2	0	0			
NO2	0	0			
N2O	0	0			
CO	0	0			
Other C-7's	3.18523E-08	0			
Other C-8's	1.31605E-07	0			
Other C-9's	4.6132E-08	0			
Other C-10's	6.56726E-09	0			
Undecanes Plus	2.30681E-13	0			

Mass Fraction	59	72			
H2S	0	0			
N2	5.78292E-08	4.24051E-06			
CO2	1.41965E-06	0			
C1	1.1165E-05	0.00100011			
C2	4.99533E-06	3.15193E-05			
C3	2.30969E-06	1.23048E-06			
iC4	2.30859E-07	0			
nC4	1.26983E-06	0			
2,2-Dimethylpropane	5.31751E-09	0			
iC5	2.43514E-07	0			
nC5	2.02481E-07	0			
2,2-Dimethylbutane	1.84278E-09	0			
Cyclopentane	6.36125E-09	0			
2,3-Dimethylbutane	7.6991E-09	0			
2-Methylpentane	3.47835E-08	0			
3-Methylpentane	6.17578E-08	0			
nC6	4.46881E-08	0			
Methylcyclopentane	1.24853E-07	0			
Benzene	8.7755E-06	0			
Cyclohexane	2.08765E-07	0			
2-Methylhexane	8.26384E-09	0			
3-Methylhexane	8.76751E-09	0			
2,2,4-Trimethylpentane	0	0			

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Mass Fraction	59	72			
Heptane	9.9527E-09	0			
Methylcyclohexane	8.73205E-08	0			
Toluene	1.29089E-05	0			
Octane	6.85912E-10	0			
Ethylbenzene	1.46396E-06	0			
m-Xylene	1.03708E-06	0			
o-Xylene	1.99895E-06	0			
n-Nonane	4.26684E-11	0			
n-Decane	1.04702E-12	0			
Water	0.999951	0.998963			
TEG	4.81536E-09	0			
O2	0	0			
NO2	0	0			
N2O	0	0			
CO	0	0			
Other C-7's	4.65296E-08	0			
Other C-8's	2.18704E-07	0			
Other C-9's	8.58871E-08	0			
Other C-10's	1.34835E-08	0			
Undecanes Plus	5.77886E-13	0			

Mass Flow	59 lb/h	72 lb/h			
H2S	0	0			
N2	3.77428E-06	0.0219856			
CO2	9.26546E-05	0			
C1	0.000728697	5.18522			
C2	0.000326025	0.163417			
C3	0.000150744	0.00637961			
iC4	1.50672E-05	0			
nC4	8.28768E-05	0			
2,2-Dimethylpropane	3.47052E-07	0			
iC5	1.58932E-05	0			
nC5	1.32151E-05	0			
2,2-Dimethylbutane	1.20271E-07	0			
Cyclopentane	4.15173E-07	0			
2,3-Dimethylbutane	5.02488E-07	0			
2-Methylpentane	2.27017E-06	0			
3-Methylpentane	4.03067E-06	0			
nC6	2.91661E-06	0			
Methylcyclopentane	8.14865E-06	0			
Benzene	0.000572741	0			
Cyclohexane	1.36253E-05	0			
2-Methylhexane	5.39347E-07	0			
3-Methylhexane	5.72219E-07	0			
2,2,4-Trimethylpentane	0	0			
Heptane	6.49572E-07	0			
Methylcyclohexane	5.69905E-06	0			
Toluene	0.00084251	0			
Octane	4.47666E-08	0			
Ethylbenzene	9.55467E-05	0			
m-Xylene	6.76857E-05	0			
o-Xylene	0.000130463	0			
n-Nonane	2.78479E-09	0			
n-Decane	6.83349E-11	0			
Water	65.2627	5179.28			
TEG	3.14279E-07	0			
O2	0	0			
NO2	0	0			
N2O	0	0			
CO	0	0			

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	Conventional Production Facility		

Mass Flow	59 lb/h	72 lb/h			
Other C-7's	3.0368E-06	0			
Other C-8's	1.42739E-05	0			
Other C-9's	5.6055E-06	0			
Other C-10's	8.80013E-07	0			
Undecanes Plus	3.77163E-11	0			

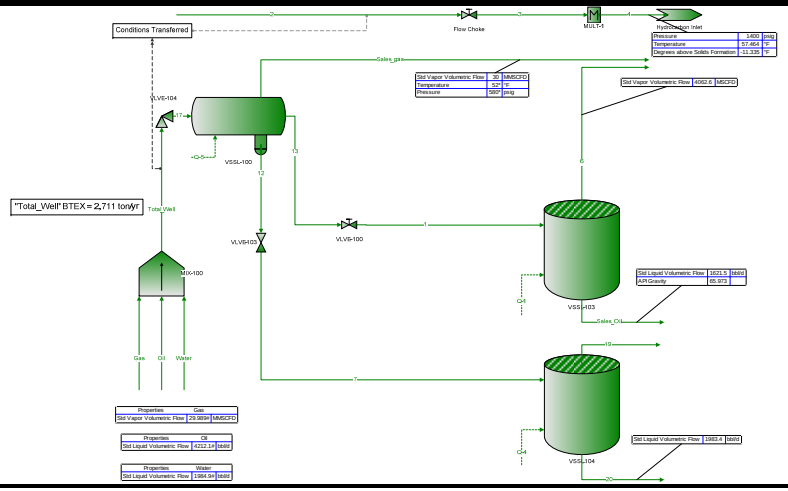
Stream Properties

Property	Units	59	72			
Temperature	°F	115	92.5737			
Pressure	psig	0.00405122	0.00405122 *			
Mole Fraction Vapor		0	0.00118606			
Mole Fraction Light Liquid		1	0.998814			
Molecular Weight	lb/lbmol	18.0157	18.0133			
Mass Density	lb/ft^3	61.746	23.4734			
Mass Flow	lb/h	65.2659	5184.65			
Vapor Volumetric Flow	ft^3/h	1.05701	220.874			
Liquid Volumetric Flow	gpm	0.131783	27.5375			
Std Vapor Volumetric Flow	MMSCFD	0.0329943	2.62138			
Std Liquid Volumetric Flow	sgpm	0.130477	10.3893			
Specific Gravity		0.990011				
API Gravity		10.0015				
Net Ideal Gas Heating Value	Btu/ft^3	0.0429718	1.05297			
Net Liquid Heating Value	Btu/lb	-1058.81	-1036.48			
Gross Ideal Gas Heating Value	Btu/ft^3	50.355	51.4214			
Gross Liquid Heating Value	Btu/lb	0.964464	24.6199			

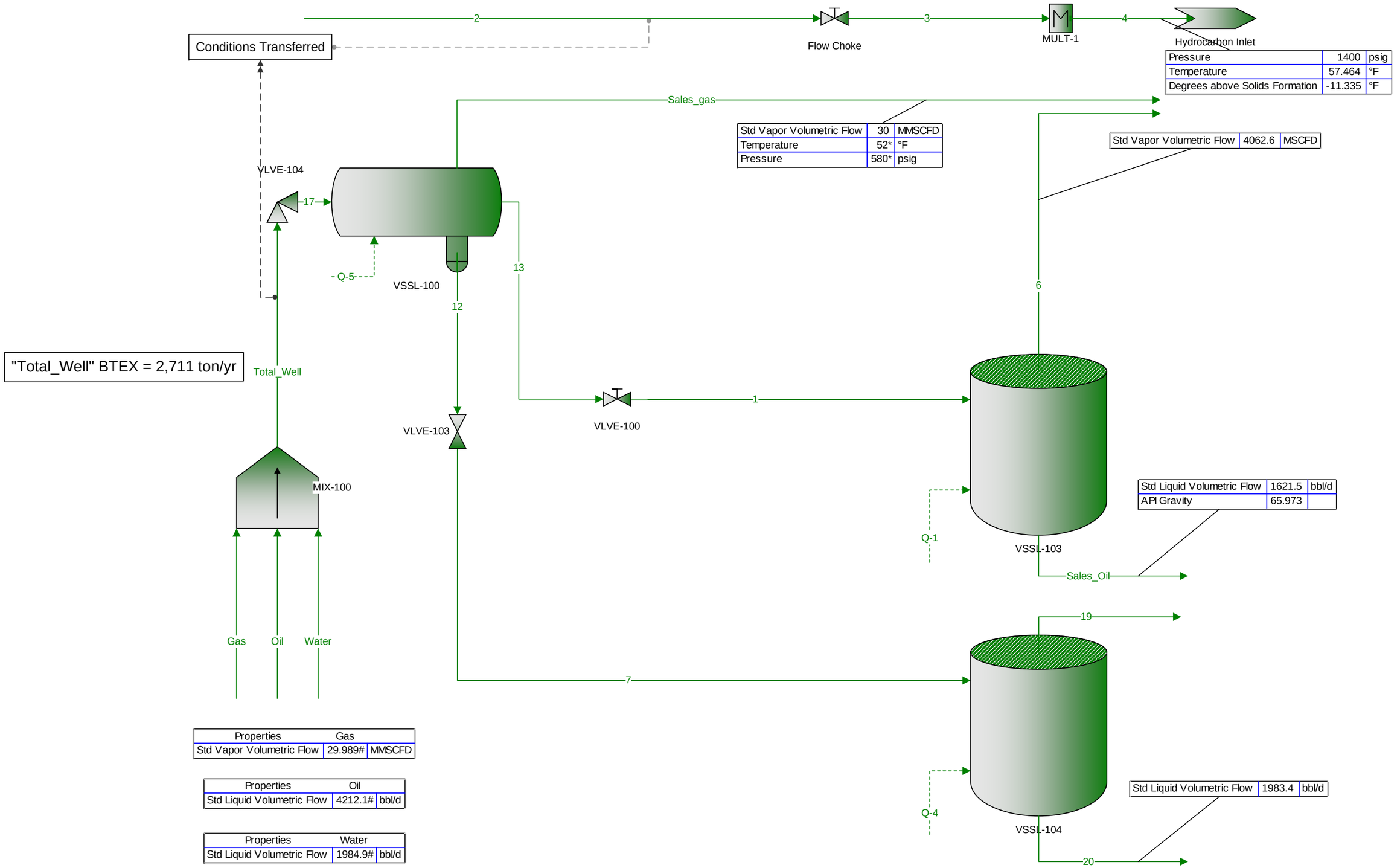
Remarks

PVT_blender
Plant Schematic

Client Name:	Triad Hunter	Job:
Location:	Wells Meckley	
Flowsheet:	PVT_blender	



* User Specified Values
? Extrapolated or Approximate Values


Conditions Transferred
2
Flow Choke
3
MULT-1
4
Hydrocarbon Inlet
Pressure 1400 psig
Temperature 57.464 °F
Degrees above Solids Formation -11.335 °F
Sales_gas
Std Vapor Volumetric Flow 30 MMSCFD
Temperature 52* °F
Pressure 580* psig
Std Vapor Volumetric Flow 4062.6 MSCFD
VLVE-104
17
Q-5
VSSL-100
13
12
6
"Total_Well" BTEX = 2,711 ton/yr
Total_Well
VLVE-103
VLVE-100
1
MIX-100
Gas
Oil
Water
Q-1
VSSL-103
Std Liquid Volumetric Flow 1621.5 bbl/d
API Gravity 65.973
Sales_Oil
19
7
Q-4
VSSL-104
Std Liquid Volumetric Flow 1983.4 bbl/d
20
Properties Gas
Std Vapor Volumetric Flow 29.989# MMSCFD
Properties Oil
Std Liquid Volumetric Flow 4212.1# bbl/d
Properties Water
Std Liquid Volumetric Flow 1984.9# bbl/d

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	PVT_blender		

Connections

	Gas	Oil	Total_Well	Water
From Block	--	--	MIX-100	--
To Block	MIX-100	MIX-100	VLVE-104	MIX-100

Stream Composition

Mole Fraction	Gas	Oil	Total_Well	Water
H2S	0 *	0 *	0	0 *
N2	0.0052 *	0.00035 *	0.00314306	0 *
CO2	0.00179 *	0.00063 *	0.00113883	0 *
C1	0.76243 *	0.1701 *	0.474103	0 *
C2	0.16041 *	0.18394 *	0.116291	0 *
C3	0.05042 *	0.1786 *	0.05004	0 *
iC4	0.00451 *	0.03491 *	0.00659031	0 *
nC4	0.01044 *	0.11243 *	0.0187863	0 *
2,2-Dimethylpropane	8E-05 *	0.00143 *	0.000207434	0 *
iC5	0.00152 *	0.03854 *	0.00521087	0 *
nC5	0.00186 *	0.059 *	0.00769848	0 *
2,2-Dimethylbutane	3E-05 *	0.00091 *	0.000119522	0 *
Cyclopentane	1E-05 *	0 *	5.96919E-06	0 *
2,3-Dimethylbutane	4E-05 *	0.00192 *	0.000238273	0 *
2-Methylpentane	0.00026 *	0.01321 *	0.00163029	0 *
3-Methylpentane	0.00015 *	0.00863 *	0.0010532	0 *
nC6	0.00037 *	0.02594 *	0.00311744	0 *
Methylcyclopentane	3E-05 *	0.00316 *	0.000370768	0 *
Benzene	1E-05 *	0.00039 *	4.95184E-05	0 *
Cyclohexane	4E-05 *	0.00364 *	0.000430336	0 *
2-Methylhexane	5E-05 *	0.01025 *	0.00117441	0 *
3-Methylhexane	6E-05 *	0.00885 *	0.00102405	0 *
2,2,4-Trimethylpentane	0 *	0 *	0	0 *
Heptane	9E-05 *	0.0174 *	0.00199669	0 *
Methylcyclohexane	4E-05 *	0.00891 *	0.00101881	0 *
Toluene	1E-05 *	0.00189 *	0.000217015	0 *
Octane	2E-05 *	0.01055 *	0.00119	0 *
Ethylbenzene	0 *	0.00188 *	0.000209929	0 *
m-Xylene	1E-05 *	0.00212 *	0.000242698	0 *
o-Xylene	0 *	0.0034 *	0.000379659	0 *
n-Nonane	0 *	0.00599 *	0.000668871	0 *
n-Decane	0 *	0.00349 *	0.000389709	0 *
Water	0 *	0 *	0.291416	1 *
TEG	0 *	0 *	0	0 *
O2	0 *	0 *	0	0 *
NO2	0 *	0 *	0	0 *
N2O	0 *	0 *	0	0 *
CO	0 *	0 *	0	0 *
Other C-7's	5E-05 *	0.00361 *	0.000432955	0 *
Other C-8's	6E-05 *	0.02459 *	0.00278165	0 *
Other C-9's	1E-05 *	0.0147 *	0.00164744	0 *
Other C-10's	0 *	0.0142 *	0.00158564	0 *
Undecanes Plus	0 *	0.03044 *	0.00339907	0 *

Molar Flow	Gas lbmol/h	Oil lbmol/h	Total_Well lbmol/h	Water lbmol/h
H2S	0 *	0 *	0	0 *
N2	17.1224 *	0.21559 *	17.338	0 *
CO2	5.89405 *	0.388062 *	6.28211	0 *
C1	2510.5 *	104.777 *	2615.28	0 *
C2	528.192 *	113.302 *	641.494	0 *
C3	166.021 *	110.012 *	276.034	0 *
iC4	14.8504 *	21.5036 *	36.3539	0 *
nC4	34.3765 *	69.2536 *	103.63	0 *

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	PVT_blender		

Molar Flow	Gas lbmol/h	Oil lbmol/h	Total_Well lbmol/h	Water lbmol/h
2,2-Dimethylpropane	0.263421 *	0.880839 *	1.14426	0 *
iC5	5.005 *	23.7395 *	28.7445	0 *
nC5	6.12454 *	36.3423 *	42.4668	0 *
2,2-Dimethylbutane	0.0987829 *	0.560534 *	0.659317	0 *
Cyclopentane	0.0329276 *	0 *	0.0329276	0 *
2,3-Dimethylbutane	0.131711 *	1.18266 *	1.31438	0 *
2-Methylpentane	0.856119 *	8.13698 *	8.9931	0 *
3-Methylpentane	0.493915 *	5.31583 *	5.80975	0 *
nC6	1.21832 *	15.9783 *	17.1966	0 *
Methylcyclopentane	0.0987829 *	1.94647 *	2.04525	0 *
Benzene	0.0329276 *	0.240229 *	0.273156	0 *
Cyclohexane	0.131711 *	2.24214 *	2.37385	0 *
2-Methylhexane	0.164638 *	6.31371 *	6.47834	0 *
3-Methylhexane	0.197566 *	5.45135 *	5.64891	0 *
2,2,4-Trimethylpentane	0 *	0 *	0	0 *
Heptane	0.296349 *	10.7179 *	11.0142	0 *
Methylcyclohexane	0.131711 *	5.4883 *	5.62001	0 *
Toluene	0.0329276 *	1.16419 *	1.19711	0 *
Octane	0.0658553 *	6.4985 *	6.56435	0 *
Ethylbenzene	0 *	1.15803 *	1.15803	0 *
m-Xylene	0.0329276 *	1.30586 *	1.33879	0 *
o-Xylene	0 *	2.0943 *	2.0943	0 *
n-Nonane	0 *	3.68967 *	3.68967	0 *
n-Decane	0 *	2.14974 *	2.14974	0 *
Water	0 *	0 *	1607.53	1607.53 *
TEG	0 *	0 *	0	0 *
O2	0 *	0 *	0	0 *
NO2	0 *	0 *	0	0 *
N2O	0 *	0 *	0	0 *
CO	0 *	0 *	0	0 *
Other C-7's	0.164638 *	2.22366 *	2.38829	0 *
Other C-8's	0.197566 *	15.1467 *	15.3443	0 *
Other C-9's	0.0329276 *	9.05478 *	9.0877	0 *
Other C-10's	0 *	8.74679 *	8.74679	0 *
Undecanes Plus	0 *	18.7502 *	18.7502	0 *

Mass Fraction	Gas	Oil	Total_Well	Water
H2S	0 *	0 *	0	0 *
N2	0.00702284 *	0.000173595 *	0.00367813	0 *
CO2	0.00379789 *	0.000490898 *	0.0020937	0 *
C1	0.589677 *	0.0483147 *	0.317725	0 *
C2	0.232538 *	0.0979264 *	0.146075	0 *
C3	0.107187 *	0.139438 *	0.0921765	0 *
iC4	0.0126375 *	0.0359249 *	0.0160013	0 *
nC4	0.029254 *	0.115699 *	0.0456132	0 *
2,2-Dimethylpropane	0.000278267 *	0.00182671 *	0.000625196	0 *
iC5	0.00528708 *	0.0492317 *	0.0157053	0 *
nC5	0.00646972 *	0.0753677 *	0.0232029	0 *
2,2-Dimethylbutane	0.000124637 *	0.00138845 *	0.000430269	0 *
Cyclopentane	3.38116E-05 *	0 *	1.74882E-05	0 *
2,3-Dimethylbutane	0.000166183 *	0.00292947 *	0.000857759	0 *
2-Methylpentane	0.00108019 *	0.0201553 *	0.00586888	0 *
3-Methylpentane	0.000623186 *	0.0131673 *	0.00379143	0 *
nC6	0.00153719 *	0.0395783 *	0.0112225	0 *
Methylcyclopentane	0.000121722 *	0.00470863 *	0.0013035	0 *
Benzene	3.76583E-05 *	0.000539369 *	0.000161581	0 *
Cyclohexane	0.000162295 *	0.00542386 *	0.00151293	0 *
2-Methylhexane	0.00024154 *	0.0181846 *	0.0049159	0 *
3-Methylhexane	0.000289848 *	0.0157009 *	0.00428651	0 *
2,2,4-Trimethylpentane	0 *	0 *	0	0 *

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	PVT_blender		

Mass Fraction	Gas	Oil	Total_Well	Water
Heptane	0.000434772 *	0.0308695 *	0.00835783	0 *
Methylcyclohexane	0.000189345 *	0.0154893 *	0.00417878	0 *
Toluene	4.44206E-05 *	0.00308324 *	0.000835293	0 *
Octane	0.000110141 *	0.0213369 *	0.00567844	0 *
Ethylbenzene	0 *	0.00353381 *	0.000931027	0 *
m-Xylene	5.11829E-05 *	0.00398494 *	0.00107635	0 *
o-Xylene	0 *	0.00639094 *	0.00168377	0 *
n-Nonane	0 *	0.0136021 *	0.00358364	0 *
n-Decane	0 *	0.00879182 *	0.00231631	0 *
Water	0 *	0 *	0.219312	1 *
TEG	0 *	0 *	0	0 *
O2	0 *	0 *	0	0 *
NO2	0 *	0 *	0	0 *
N2O	0 *	0 *	0	0 *
CO	0 *	0 *	0	0 *
Other C-7's	0.00022982 *	0.00609378 *	0.00172435	0 *
Other C-8's	0.000313736 *	0.0472207 *	0.0126032	0 *
Other C-9's	5.85808E-05 *	0.0316252 *	0.00836236	0 *
Other C-10's	0 *	0.0336897 *	0.00887598	0 *
Undecanes Plus	0 *	0.0881184 *	0.0232159	0 *

Mass Flow	Gas lb/h	Oil lb/h	Total_Well lb/h	Water lb/h
H2S	0 *	0 *	0	0 *
N2	479.656 *	6.03941 *	485.695	0 *
CO2	259.394 *	17.0784 *	276.472	0 *
C1	40274.6 *	1680.88 *	41955.5	0 *
C2	15882.2 *	3406.87 *	19289.1	0 *
C3	7320.81 *	4851.07 *	12171.9	0 *
iC4	863.136 *	1249.83 *	2112.97	0 *
nC4	1998.04 *	4025.17 *	6023.21	0 *
2,2-Dimethylpropane	19.0055 *	63.5514 *	82.557	0 *
iC5	361.105 *	1712.78 *	2073.88	0 *
nC5	441.878 *	2622.05 *	3063.93	0 *
2,2-Dimethylbutane	8.51265 *	48.3042 *	56.8169	0 *
Cyclopentane	2.30931 *	0 *	2.30931	0 *
2,3-Dimethylbutane	11.3502 *	101.917 *	113.267	0 *
2-Methylpentane	73.7763 *	701.207 *	774.983	0 *
3-Methylpentane	42.5633 *	458.094 *	500.657	0 *
nC6	104.989 *	1376.94 *	1481.92	0 *
Methylcyclopentane	8.31352 *	163.814 *	172.127	0 *
Benzene	2.57204 *	18.7647 *	21.3368	0 *
Cyclohexane	11.0847 *	188.697 *	199.782	0 *
2-Methylhexane	16.4971 *	632.645 *	649.143	0 *
3-Methylhexane	19.7965 *	546.235 *	566.032	0 *
2,2,4-Trimethylpentane	0 *	0 *	0	0 *
Heptane	29.6947 *	1073.95 *	1103.65	0 *
Methylcyclohexane	12.9321 *	538.875 *	551.807	0 *
Toluene	3.0339 *	107.266 *	110.3	0 *
Octane	7.52255 *	742.314 *	749.836	0 *
Ethylbenzene	0 *	122.942 *	122.942	0 *
m-Xylene	3.49576 *	138.637 *	142.132	0 *
o-Xylene	0 *	222.342 *	222.342	0 *
n-Nonane	0 *	473.219 *	473.219	0 *
n-Decane	0 *	305.869 *	305.869	0 *
Water	0 *	0 *	28960.1	28960.1 *
TEG	0 *	0 *	0	0 *
O2	0 *	0 *	0	0 *
NO2	0 *	0 *	0	0 *
N2O	0 *	0 *	0	0 *
CO	0 *	0 *	0	0 *

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	PVT_blender		

Mass Flow	Gas lb/h	Oil lb/h	Total_Well lb/h	Water lb/h
Other C-7's	15.6966 *	212.003 *	227.7	0 *
Other C-8's	21.428 *	1642.81 *	1664.24	0 *
Other C-9's	4.00104 *	1100.25 *	1104.25	0 *
Other C-10's	0 *	1172.07 *	1172.07	0 *
Undecanes Plus	0 *	3065.65 *	3065.65	0 *

Stream Properties

Property	Units	Gas	Oil	Total_Well	Water
Temperature	°F	80 *	80 *	80.6401	80 *
Pressure	psig	4266 *	4266 *	4266	4266 *
Mole Fraction Vapor		1	0	0	0
Mole Fraction Light Liquid		0	1	0.708005	1
Molecular Weight	lb/lbmol	20.7423	56.4801	23.9382	18.0153
Mass Density	lb/ft^3	17.4389	38.6575	25.803	62.4177
Mass Flow	lb/h	68299.4	34790.1	132050	28960.1
Vapor Volumetric Flow	ft^3/h	3916.49	899.958	5117.6	463.972
Liquid Volumetric Flow	gpm	488.29	112.202	638.039	57.8459
Std Vapor Volumetric Flow	MMSCFD	29.9892 *	5.61003	50.24	14.6408
Std Liquid Volumetric Flow	sgpm	401.973	122.853 *	582.72	57.8933 *
Specific Gravity		0.716175	0.61982	0.413716	1.00078
API Gravity			92.9735	184.236 ?	9.49023
Net Ideal Gas Heating Value	Btu/ft^3	1133.71	2909.2	1001.59	0
Net Liquid Heating Value	Btu/lb	20679.3	19383.1	15570.2	-1059.76
Gross Ideal Gas Heating Value	Btu/ft^3	1250.01	3146.75	1112.19	50.3101
Gross Liquid Heating Value	Btu/lb	22807	20978.2	17323.3	0

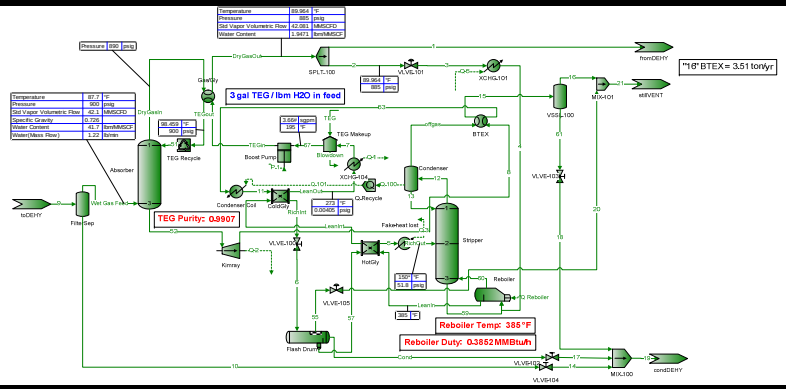
Warnings

ProMax:ProMax!Project!Flowsheets!PVT_blender!PStreams!Total_Well
Warning: The temperature of 80.6401 °F is within 10 °F of hydrate formation.

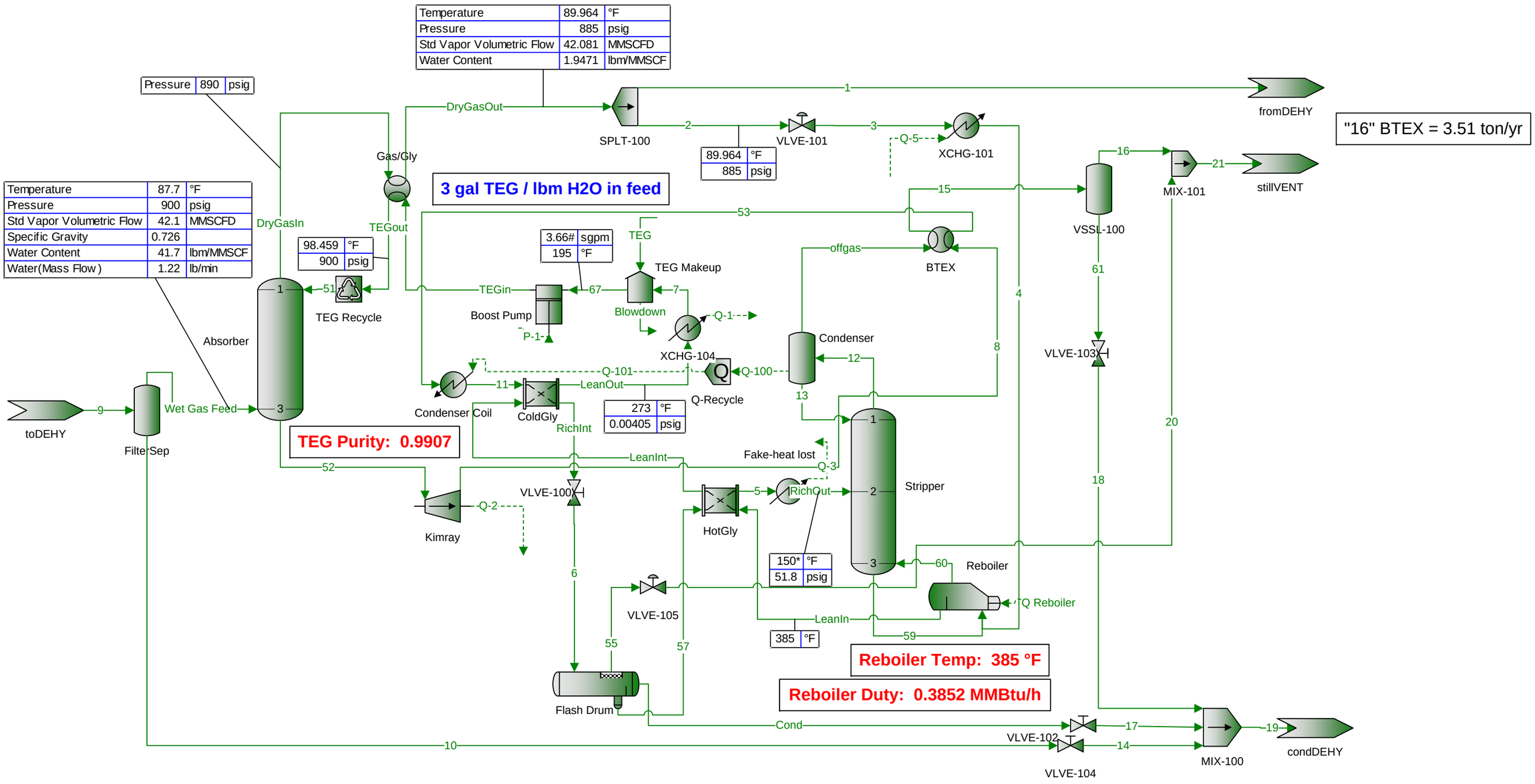
Remarks

tofromDEHY
Plant Schematic

Client Name:	Triad Hunter	Job:
Location:	Wells Meckley	
Flowsheet:	tofromDEHY	



* User Specified Values
? Extrapolated or Approximate Values


Temperature 89.964 °F
Pressure 885 psig
Std Vapor Volumetric Flow 42.081 MMSCFD
Water Content 1.9471 lbm/MMSCF
Pressure 890 psig
DryGasOut
1
fromDEHY
SPLT-100
2
VLVE-101
3
Q-5
XCHG-101
"16" BTEX = 3.51 ton/yr
89.964 °F
885 psig
Gas/Gly
3 gal TEG / lbm H2O in feed
16
21
MIX-101
stillVENT
Temperature 87.7 °F
Pressure 900 psig
Std Vapor Volumetric Flow 42.1 MMSCFD
Specific Gravity 0.726
Water Content 41.7 lbm/MMSCF
Water(Mass Flow) 1.22 lb/min
DryGasIn
TEGout
15
53
VSSL-100
3.66# sgpm
195 °F
TEG
offgas
BTEX
98.459 °F
900 psig
TEG Makeup
61
1
51
TEGin
67
7
4
TEG Recycle
Boost Pump
P-1
Blowdown
Q-1
Absorber
XCHG-104
Condenser
8
VLVE-103
Q-101
Q-100
12
11
LeanOut
Q-Recycle
13
Condenser Coil
ColdGly
273 °F
0.00405 psig
toDEHY
9
Wet Gas Feed
3
Filter Sep
RichInt
TEG Purity: 0.9907
20
LeanInt
Fake-heat lost
Q-3
1
18
52
VLVE-100
5
RichOut
2
Stripper
Q-2
Kimray
HotGly
150* °F
51.8 psig
60
Reboiler
6
VLVE-105
Q Reboiler
LeanIn
385 °F
59
55
57
Reboiler Temp: 385 °F
Reboiler Duty: 0.3852 MMBtu/h
Flash Drum
Cond
VLVE-102
17
19
condDEHY
10
14
MIX-100
VLVE-104

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	tofromDEHY		

Connections

	Wet Gas Feed				
From Block	FilterSep				
To Block	Absorber				

Stream Composition

Mole Fraction	Wet Gas Feed				
H2S	0				
N2	0.00453375				
CO2	0.00124552				
C1	0.775713				
C2	0.131304				
C3	0.0535706				
iC4	0.00637781				
nC4	0.0166094				
2,2-Dimethylpropane	0.00016983				
iC5	0.00327914				
nC5	0.00417937				
2,2-Dimethylbutane	4.63322E-05				
Cyclopentane	2.64082E-06				
2,3-Dimethylbutane	7.24367E-05				
2-Methylpentane	0.000466901				
3-Methylpentane	0.000266797				
nC6	0.000644896				
Methylcyclopentane	7.56396E-05				
Benzene	1.0306E-05				
Cyclohexane	7.13017E-05				
2-Methylhexane	0.000103724				
3-Methylhexane	7.91559E-05				
2,2,4-Trimethylpentane	0				
Heptane	0.000112715				
Methylcyclohexane	5.24028E-05				
Toluene	1.05443E-05				
Octane	1.13994E-05				
Ethylbenzene	1.74084E-06				
m-Xylene	1.67972E-06				
o-Xylene	2.02073E-06				
n-Nonane	6.40774E-07				
n-Decane	4.4961E-08				
Water	0.000878485				
TEG	0				
O2	0				
NO2	0				
N2O	0				
CO	0				
Other C-7's	4.02117E-05				
Other C-8's	5.87305E-05				
Other C-9's	5.40528E-06				
Other C-10's	6.63396E-07				
Undecanes Plus	8.83298E-09				

Molar Flow	Wet Gas Feed lbmol/h				
H2S	0				
N2	20.9697				
CO2	5.7608				
C1	3587.86				
C2	607.314				
C3	247.777				
iC4	29.4989				
nC4	76.8226				

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	tofromDEHY		

Molar Flow	Wet Gas Feed lbmol/h				
2,2-Dimethylpropane	0.785505				
iC5	15.1668				
nC5	19.3306				
2,2-Dimethylbutane	0.214297				
Cyclopentane	0.0122144				
2,3-Dimethylbutane	0.335037				
2-Methylpentane	2.15953				
3-Methylpentane	1.234				
nC6	2.98279				
Methylcyclopentane	0.349851				
Benzene	0.0476676				
Cyclohexane	0.329787				
2-Methylhexane	0.479747				
3-Methylhexane	0.366115				
2,2,4-Trimethylpentane	0				
Heptane	0.521335				
Methylcyclohexane	0.242375				
Toluene	0.0487697				
Octane	0.0527249				
Ethylbenzene	0.00805178				
m-Xylene	0.0077691				
o-Xylene	0.00934635				
n-Nonane	0.00296373				
n-Decane	0.000207955				
Water	4.0632				
TEG	0				
O2	0				
NO2	0				
N2O	0				
CO	0				
Other C-7's	0.185989				
Other C-8's	0.271642				
Other C-9's	0.0250007				
Other C-10's	0.00306836				
Undecanes Plus	4.08546E-05				

Mass Fraction	Wet Gas Feed				
H2S	0				
N2	0.00603929				
CO2	0.0026065				
C1	0.591745				
C2	0.187742				
C3	0.112327				
iC4	0.0176269				
nC4	0.045905				
2,2-Dimethylpropane	0.000582649				
iC5	0.01125				
nC5	0.0143385				
2,2-Dimethylbutane	0.000189858				
Cyclopentane	8.8069E-06				
2,3-Dimethylbutane	0.000296828				
2-Methylpentane	0.00191325				
3-Methylpentane	0.00109327				
nC6	0.00264262				
Methylcyclopentane	0.000302702				
Benzene	3.82797E-05				
Cyclohexane	0.000285342				
2-Methylhexane	0.000494217				
3-Methylhexane	0.000377157				
2,2,4-Trimethylpentane	0				

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	tofromDEHY		

Mass Fraction	Wet Gas Feed				
Heptane	0.000537059				
Methylcyclohexane	0.000244662				
Toluene	4.61976E-05				
Octane	6.19184E-05				
Ethylbenzene	8.78825E-06				
m-Xylene	8.47971E-06				
o-Xylene	1.02012E-05				
n-Nonane	3.90789E-06				
n-Decane	3.04192E-07				
Water	0.000752554				
TEG	0				
O2	0				
NO2	0				
N2O	0				
CO	0				
Other C-7's	0.000182301				
Other C-8's	0.000302898				
Other C-9's	3.12315E-05				
Other C-10's	4.22708E-06				
Undecanes Plus	6.86733E-08				

Mass Flow	Wet Gas Feed lb/h				
H2S	0				
N2	587.432				
CO2	253.53				
C1	57558				
C2	18261.3				
C3	10925.9				
iC4	1714.54				
nC4	4465.1				
2,2-Dimethylpropane	56.6733				
iC5	1094.27				
nC5	1394.68				
2,2-Dimethylbutane	18.4671				
Cyclopentane	0.856632				
2,3-Dimethylbutane	28.8719				
2-Methylpentane	186.098				
3-Methylpentane	106.34				
nC6	257.043				
Methylcyclopentane	29.4433				
Benzene	3.7234				
Cyclohexane	27.7547				
2-Methylhexane	48.0716				
3-Methylhexane	36.6854				
2,2,4-Trimethylpentane	0				
Heptane	52.2388				
Methylcyclohexane	23.7979				
Toluene	4.49356				
Octane	6.02269				
Ethylbenzene	0.854818				
m-Xylene	0.824807				
o-Xylene	0.992255				
n-Nonane	0.380113				
n-Decane	0.0295882				
Water	73.1997				
TEG	0				
O2	0				
NO2	0				
N2O	0				
CO	0				

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Triad Hunter	Job:	
Location:	Wells Meckley		
Flowsheet:	tofromDEHY		

Mass Flow	Wet Gas Feed lb/h				
Other C-7's	17.7321				
Other C-8's	29.4623				
Other C-9's	3.03783				
Other C-10's	0.411161				
Undecanes Plus	0.00667973				

Stream Properties

Property	Units	Wet Gas Feed				
Temperature	°F	87.7108				
Pressure	psig	900				
Mole Fraction Vapor		1				
Mole Fraction Light Liquid		0				
Molecular Weight	lb/lbmol	21.0299				
Mass Density	lb/ft^3	4.0115				
Mass Flow	lb/h	97268.3				
Vapor Volumetric Flow	ft^3/h	24247.4				
Liquid Volumetric Flow	gpm	3023.05				
Std Vapor Volumetric Flow	MMSCFD	42.1248				
Std Liquid Volumetric Flow	sgpm	563.536				
Specific Gravity		0.726106				
API Gravity						
Net Ideal Gas Heating Value	Btu/ft^3	1149.13				
Net Liquid Heating Value	Btu/lb	20672.7				
Gross Ideal Gas Heating Value	Btu/ft^3	1266.61				
Gross Liquid Heating Value	Btu/lb	22792.6				

Remarks

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Blue Ridge - Wells Meckley Dehy
File Name: Y:\CLIENTS\A-C\Blue Ridge\WV Wells Meckley\05 Att T - Calculations\GLYCalc\Wells Meckley Dehy 20171026 1746_DJW.ddf
Date: October 26, 2017

DESCRIPTION:

Description: PTE for G70-D Application

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 87.71 deg. F
Pressure: 900.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.1246
Nitrogen	0.4534
Methane	77.5713
Ethane	13.1304
Propane	5.3571
Isobutane	0.6378
n-Butane	1.6609
Isopentane	0.3272
n-Pentane	0.4392
Cyclopentane	0.0003
n-Hexane	0.0645
Cyclohexane	0.0071
Other Hexanes	0.0928
Heptanes	0.0336
Methylcyclohexane	0.0052
Benzene	0.0010
Toluene	0.0011
Ethylbenzene	0.0002
Xylenes	0.0004
C8+ Heavies	0.0077

DRY GAS:

Flow Rate: 42.1 MMSCF/day
Water Content: 1.9 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 0.9 wt% H2O
Flow Rate: 7.5 gpm

PUMP:

Glycol Pump Type: Electric/Pneumatic

FLASH TANK:

Flash Control: Combustion device
Flash Control Efficiency: 98.00 %
Temperature: 200.0 deg. F
Pressure: 57.0 psig

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device: Condenser
Temperature: 32.0 deg. F
Pressure: 14.7 psia

Control Device: Combustion Device
Destruction Efficiency: 95.0 %
Excess Oxygen: 5.0 %
Ambient Air Temperature: 60.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Blue Ridge - Wells Meckley Dehy
File Name: P:\CLIENTS\A-C\Blue Ridge\WV Wells Meckley\05 Att T - Calculations\GLYCalc\Wells Meckley Dehy 20171026 1746_DJW.ddf
Date: October 26, 2017

DESCRIPTION:

Description: PTE for G70-D Application

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0282	0.678	0.1237
Ethane	0.0702	1.686	0.3076
Propane	0.0962	2.309	0.4215
Isobutane	0.0218	0.524	0.0957
n-Butane	0.0763	1.832	0.3343
Isopentane	0.0105	0.252	0.0459
n-Pentane	0.0184	0.441	0.0805
Cyclopentane	0.0001	0.002	0.0003
n-Hexane	0.0024	0.058	0.0106
Cyclohexane	0.0016	0.037	0.0068
Other Hexanes	0.0038	0.090	0.0165
Heptanes	0.0006	0.014	0.0025
Methylcyclohexane	0.0006	0.015	0.0028
Benzene	0.0022	0.052	0.0095
Toluene	0.0010	0.024	0.0044
Ethylbenzene	0.0001	0.002	0.0003
Xylenes	0.0001	0.003	0.0006
C8+ Heavies	<0.0001	<0.001	<0.0001
Total Emissions	0.3341	8.019	1.4635
Total Hydrocarbon Emissions	0.3341	8.019	1.4635
Total VOC Emissions	0.2357	5.656	1.0322
Total HAP Emissions	0.0058	0.139	0.0254
Total BTEX Emissions	0.0034	0.081	0.0148

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.5664	13.593	2.4807
Ethane	1.4218	34.123	6.2275
Propane	2.0864	50.074	9.1386
Isobutane	0.5307	12.738	2.3246
n-Butane	2.0808	49.939	9.1138
Isopentane	0.4948	11.875	2.1672
n-Pentane	0.9577	22.984	4.1945
Cyclopentane	0.0048	0.114	0.0208
n-Hexane	0.3324	7.978	1.4560
Cyclohexane	0.2792	6.701	1.2229

Other Hexanes	0.3254	7.810	1.4253
Heptanes	0.4558	10.940	1.9965
Methylcyclohexane	0.2547	6.113	1.1157
Benzene	0.4043	9.703	1.7708
Toluene	0.6642	15.941	2.9092
Ethylbenzene	0.1576	3.783	0.6905
Xylenes	0.4526	10.862	1.9823
C8+ Heavies	0.1570	3.767	0.6875
Total Emissions	11.6266	279.039	50.9246
Total Hydrocarbon Emissions	11.6266	279.039	50.9246
Total VOC Emissions	9.6384	231.323	42.2164
Total HAP Emissions	2.0112	48.268	8.8089
Total BTEX Emissions	1.6787	40.289	7.3528

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.2031	4.874	0.8894
Ethane	0.1764	4.234	0.7728
Propane	0.1379	3.310	0.6040
Isobutane	0.0269	0.645	0.1176
n-Butane	0.0864	2.073	0.3784
Isopentane	0.0200	0.481	0.0878
n-Pentane	0.0327	0.785	0.1432
Cyclopentane	<0.0001	0.001	0.0002
n-Hexane	0.0073	0.176	0.0321
Cyclohexane	0.0016	0.038	0.0069
Other Hexanes	0.0090	0.216	0.0394
Heptanes	0.0057	0.138	0.0251
Methylcyclohexane	0.0013	0.030	0.0055
Benzene	0.0005	0.011	0.0020
Toluene	0.0006	0.013	0.0025
Ethylbenzene	0.0001	0.002	0.0004
Xylenes	0.0002	0.005	0.0008
C8+ Heavies	0.0087	0.209	0.0381
Total Emissions	0.7183	17.239	3.1461
Total Hydrocarbon Emissions	0.7183	17.239	3.1461
Total VOC Emissions	0.3388	8.131	1.4839
Total HAP Emissions	0.0086	0.207	0.0378
Total BTEX Emissions	0.0013	0.031	0.0057

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	10.1532	243.676	44.4709
Ethane	8.8218	211.722	38.6393
Propane	6.8949	165.479	30.1999
Isobutane	1.3427	32.225	5.8811
n-Butane	4.3192	103.662	18.9182
Isopentane	1.0021	24.051	4.3893
n-Pentane	1.6345	39.228	7.1592
Cyclopentane	0.0021	0.049	0.0090
n-Hexane	0.3664	8.793	1.6048
Cyclohexane	0.0786	1.887	0.3443

Other Hexanes	0.4500	10.800	1.9710
Heptanes	0.2869	6.886	1.2567
Methylcyclohexane	0.0626	1.502	0.2741
Benzene	0.0227	0.545	0.0995
Toluene	0.0281	0.674	0.1229
Ethylbenzene	0.0044	0.107	0.0195
Xylenes	0.0094	0.226	0.0413
C8+ Heavies	0.4347	10.433	1.9041
Total Emissions	35.9144	861.945	157.3049
Total Hydrocarbon Emissions	35.9144	861.945	157.3049
Total VOC Emissions	16.9395	406.547	74.1948
Total HAP Emissions	0.4310	10.345	1.8880
Total BTEX Emissions	0.0647	1.552	0.2832

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.2313	5.551	1.0131
Ethane	0.2467	5.920	1.0804
Propane	0.2341	5.619	1.0255
Isobutane	0.0487	1.169	0.2133
n-Butane	0.1627	3.905	0.7126
Isopentane	0.0305	0.733	0.1337
n-Pentane	0.0511	1.226	0.2237
Cyclopentane	0.0001	0.003	0.0005
n-Hexane	0.0097	0.234	0.0427
Cyclohexane	0.0031	0.075	0.0137
Other Hexanes	0.0128	0.306	0.0559
Heptanes	0.0063	0.151	0.0276
Methylcyclohexane	0.0019	0.045	0.0083
Benzene	0.0026	0.063	0.0114
Toluene	0.0016	0.038	0.0069
Ethylbenzene	0.0002	0.004	0.0007
Xylenes	0.0003	0.008	0.0014
C8+ Heavies	0.0087	0.209	0.0381
Total Emissions	1.0524	25.258	4.6096
Total Hydrocarbon Emissions	1.0524	25.258	4.6096
Total VOC Emissions	0.5745	13.787	2.5161
Total HAP Emissions	0.0144	0.346	0.0632
Total BTEX Emissions	0.0047	0.112	0.0205

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction
Methane	46.9516	1.0131	97.84
Ethane	44.8668	1.0804	97.59
Propane	39.3384	1.0255	97.39
Isobutane	8.2057	0.2133	97.40
n-Butane	28.0320	0.7126	97.46
Isopentane	6.5565	0.1337	97.96
n-Pentane	11.3537	0.2237	98.03

Cyclopentane	0.0298	0.0005	98.32
n-Hexane	3.0608	0.0427	98.61
Cyclohexane	1.5672	0.0137	99.12
Other Hexanes	3.3963	0.0559	98.35
Heptanes	3.2533	0.0276	99.15
Methylcyclohexane	1.3897	0.0083	99.41
Benzene	1.8703	0.0114	99.39
Toluene	3.0321	0.0069	99.77
Ethylbenzene	0.7100	0.0007	99.90
Xylenes	2.0236	0.0014	99.93
C8+ Heavies	2.5916	0.0381	98.53
Total Emissions	208.2295	4.6096	97.79
Total Hydrocarbon Emissions	208.2295	4.6096	97.79
Total VOC Emissions	116.4112	2.5161	97.84
Total HAP Emissions	10.6968	0.0632	99.41
Total BTEX Emissions	7.6360	0.0205	99.73

EQUIPMENT REPORTS:

CONDENSER AND COMBUSTION DEVICE

Condenser Outlet Temperature:	32.00 deg. F
Condenser Pressure:	14.70 psia
Condenser Duty:	2.89e-002 MM BTU/hr
Hydrocarbon Recovery:	0.40 bbls/day
Produced Water:	5.10 bbls/day
Ambient Temperature:	60.00 deg. F
Excess Oxygen:	5.00 %
Combustion Efficiency:	95.00 %
Supplemental Fuel Requirement:	2.89e-002 MM BTU/hr

Component	Emitted	Destroyed
Methane	4.98%	95.02%
Ethane	4.94%	95.06%
Propane	4.61%	95.39%
Isobutane	4.12%	95.88%
n-Butane	3.67%	96.33%
Isopentane	2.12%	97.88%
n-Pentane	1.92%	98.08%
Cyclopentane	1.54%	98.46%
n-Hexane	0.73%	99.27%
Cyclohexane	0.56%	99.44%
Other Hexanes	1.16%	98.84%
Heptanes	0.12%	99.88%
Methylcyclohexane	0.25%	99.75%
Benzene	0.53%	99.47%
Toluene	0.15%	99.85%
Ethylbenzene	0.04%	99.96%
Xylenes	0.03%	99.97%
C8+ Heavies	0.00%	100.00%

ABSORBER

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

Calculated Absorber Stages:	1.25
Calculated Dry Gas Dew Point:	1.55 lbs. H2O/MMSCF
Temperature:	87.7 deg. F
Pressure:	900.0 psig
Dry Gas Flow Rate:	42.1000 MMSCF/day
Glycol Losses with Dry Gas:	0.5721 lb/hr
Wet Gas Water Content:	Saturated
Calculated Wet Gas Water Content:	44.05 lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	6.03 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.51%	96.49%
Carbon Dioxide	99.74%	0.26%
Nitrogen	99.98%	0.02%
Methane	99.98%	0.02%
Ethane	99.94%	0.06%
Propane	99.92%	0.08%
Isobutane	99.89%	0.11%
n-Butane	99.86%	0.14%
Isopentane	99.86%	0.14%
n-Pentane	99.82%	0.18%
Cyclopentane	99.21%	0.79%
n-Hexane	99.73%	0.27%
Cyclohexane	98.71%	1.29%
Other Hexanes	99.79%	0.21%
Heptanes	99.52%	0.48%
Methylcyclohexane	98.67%	1.33%
Benzene	88.54%	11.46%
Toluene	84.60%	15.40%
Ethylbenzene	81.05%	18.95%
Xylenes	74.58%	25.42%
C8+ Heavies	99.02%	0.98%

FLASH TANK

Flash Control:	Combustion device
Flash Control Efficiency:	98.00 %
Flash Temperature:	200.0 deg. F
Flash Pressure:	57.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.78%	0.22%
Carbon Dioxide	28.98%	71.02%
Nitrogen	5.20%	94.80%
Methane	5.28%	94.72%
Ethane	13.88%	86.12%
Propane	23.23%	76.77%
Isobutane	28.33%	71.67%
n-Butane	32.51%	67.49%
Isopentane	33.39%	66.61%
n-Pentane	37.26%	62.74%

Cyclopentane	69.90%	30.10%
n-Hexane	47.83%	52.17%
Cyclohexane	78.73%	21.27%
Other Hexanes	42.55%	57.45%
Heptanes	61.56%	38.44%
Methylcyclohexane	81.07%	18.93%
Benzene	94.95%	5.05%
Toluene	96.27%	3.73%
Ethylbenzene	97.54%	2.46%
Xylenes	98.22%	1.78%
C8+ Heavies	35.36%	64.64%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	33.82%	66.18%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	1.50%	98.50%
n-Pentane	1.34%	98.66%
Cyclopentane	0.72%	99.28%
n-Hexane	1.05%	98.95%
Cyclohexane	4.06%	95.94%
Other Hexanes	2.35%	97.65%
Heptanes	0.81%	99.19%
Methylcyclohexane	4.93%	95.07%
Benzene	5.27%	94.73%
Toluene	8.21%	91.79%
Ethylbenzene	10.67%	89.33%
Xylenes	13.16%	86.84%
C8+ Heavies	34.00%	66.00%

STREAM REPORTS:

WET GAS STREAM

Temperature: 87.71 deg. F
Pressure: 914.70 psia
Flow Rate: 1.76e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.28e-002	7.74e+001
Carbon Dioxide	1.25e-001	2.54e+002

Nitrogen	4.53e-001	5.88e+002
Methane	7.76e+001	5.76e+004
Ethane	1.31e+001	1.83e+004
Propane	5.36e+000	1.09e+004
Isobutane	6.38e-001	1.72e+003
n-Butane	1.66e+000	4.47e+003
Isopentane	3.27e-001	1.09e+003
n-Pentane	4.39e-001	1.47e+003
Cyclopentane	2.64e-004	8.57e-001
n-Hexane	6.45e-002	2.57e+002
Cyclohexane	7.13e-003	2.78e+001
Other Hexanes	9.28e-002	3.70e+002
Heptanes	3.36e-002	1.56e+002
Methylcyclohexane	5.24e-003	2.38e+001
Benzene	1.03e-003	3.73e+000
Toluene	1.05e-003	4.50e+000
Ethylbenzene	1.74e-004	8.56e-001
Xylenes	3.70e-004	1.82e+000
C8+ Heavies	7.69e-003	6.06e+001
Total Components	100.00	9.74e+004

DRY GAS STREAM

Temperature: 87.71 deg. F
Pressure: 914.70 psia
Flow Rate: 1.75e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.26e-003	2.71e+000
Carbon Dioxide	1.24e-001	2.53e+002
Nitrogen	4.54e-001	5.88e+002
Methane	7.76e+001	5.76e+004
Ethane	1.31e+001	1.83e+004
Propane	5.36e+000	1.09e+004
Isobutane	6.38e-001	1.71e+003
n-Butane	1.66e+000	4.46e+003
Isopentane	3.27e-001	1.09e+003
n-Pentane	4.39e-001	1.46e+003
Cyclopentane	2.62e-004	8.50e-001
n-Hexane	6.44e-002	2.57e+002
Cyclohexane	7.05e-003	2.74e+001
Other Hexanes	9.27e-002	3.69e+002
Heptanes	3.35e-002	1.55e+002
Methylcyclohexane	5.18e-003	2.35e+001
Benzene	9.14e-004	3.30e+000
Toluene	8.93e-004	3.80e+000
Ethylbenzene	1.41e-004	6.93e-001
Xylenes	2.76e-004	1.36e+000
C8+ Heavies	7.62e-003	6.00e+001
Total Components	100.00	9.72e+004

LEAN GLYCOL STREAM

Temperature: 87.71 deg. F

Flow Rate: 7.50e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.91e+001	4.19e+003
Water	9.00e-001	3.80e+001
Carbon Dioxide	1.54e-012	6.52e-011
Nitrogen	3.05e-013	1.29e-011
Methane	8.52e-018	3.60e-016
Ethane	1.14e-007	4.83e-006
Propane	8.65e-009	3.65e-007
Isobutane	1.33e-009	5.62e-008
n-Butane	3.76e-009	1.59e-007
Isopentane	1.78e-004	7.52e-003
n-Pentane	3.08e-004	1.30e-002
Cyclopentane	8.10e-007	3.42e-005
n-Hexane	8.31e-005	3.51e-003
Cyclohexane	2.80e-004	1.18e-002
Other Hexanes	1.85e-004	7.83e-003
Heptanes	8.83e-005	3.73e-003
Methylcyclohexane	3.13e-004	1.32e-002
Benzene	5.32e-004	2.25e-002
Toluene	1.41e-003	5.94e-002
Ethylbenzene	4.46e-004	1.88e-002
Xylenes	1.62e-003	6.86e-002
C8+ Heavies	1.91e-003	8.09e-002
Total Components	100.00	4.23e+003

RICH GLYCOL STREAM

Temperature: 87.71 deg. F
Pressure: 914.70 psia
Flow Rate: 7.75e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.63e+001	4.19e+003
Water	2.59e+000	1.13e+002
Carbon Dioxide	1.50e-002	6.52e-001
Nitrogen	2.97e-003	1.29e-001
Methane	2.47e-001	1.07e+001
Ethane	2.36e-001	1.02e+001
Propane	2.07e-001	8.98e+000
Isobutane	4.31e-002	1.87e+000
n-Butane	1.47e-001	6.40e+000
Isopentane	3.46e-002	1.50e+000
n-Pentane	5.99e-002	2.61e+000
Cyclopentane	1.57e-004	6.85e-003
n-Hexane	1.62e-002	7.02e-001
Cyclohexane	8.50e-003	3.70e-001
Other Hexanes	1.80e-002	7.83e-001
Heptanes	1.72e-002	7.46e-001
Methylcyclohexane	7.60e-003	3.31e-001
Benzene	1.03e-002	4.49e-001
Toluene	1.73e-002	7.52e-001
Ethylbenzene	4.16e-003	1.81e-001

Xylenes	1.22e-002	5.31e-001
C8+ Heavies	1.55e-002	6.73e-001
Total Components	100.00	4.35e+003

FLASH TANK OFF GAS STREAM

Temperature: 200.00 deg. F
Pressure: 71.70 psia
Flow Rate: 4.79e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.10e+000	2.51e-001
Carbon Dioxide	8.34e-001	4.63e-001
Nitrogen	3.46e-001	1.22e-001
Methane	5.01e+001	1.02e+001
Ethane	2.32e+001	8.82e+000
Propane	1.24e+001	6.89e+000
Isobutane	1.83e+000	1.34e+000
n-Butane	5.89e+000	4.32e+000
Isopentane	1.10e+000	1.00e+000
n-Pentane	1.79e+000	1.63e+000
Cyclopentane	2.33e-003	2.06e-003
n-Hexane	3.37e-001	3.66e-001
Cyclohexane	7.40e-002	7.86e-002
Other Hexanes	4.14e-001	4.50e-001
Heptanes	2.27e-001	2.87e-001
Methylcyclohexane	5.05e-002	6.26e-002
Benzene	2.30e-002	2.27e-002
Toluene	2.41e-002	2.81e-002
Ethylbenzene	3.32e-003	4.44e-003
Xylenes	7.04e-003	9.43e-003
C8+ Heavies	2.02e-001	4.35e-001
Total Components	100.00	3.68e+001

FLASH TANK GLYCOL STREAM

Temperature: 200.00 deg. F
Flow Rate: 7.67e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.71e+001	4.19e+003
Water	2.61e+000	1.12e+002
Carbon Dioxide	4.38e-003	1.89e-001
Nitrogen	1.56e-004	6.71e-003
Methane	1.31e-002	5.66e-001
Ethane	3.30e-002	1.42e+000
Propane	4.84e-002	2.09e+000
Isobutane	1.23e-002	5.31e-001
n-Butane	4.83e-002	2.08e+000
Isopentane	1.17e-002	5.02e-001
n-Pentane	2.25e-002	9.71e-001
Cyclopentane	1.11e-004	4.79e-003
n-Hexane	7.79e-003	3.36e-001
Cyclohexane	6.75e-003	2.91e-001

Other Hexanes	7.73e-003	3.33e-001
Heptanes	1.07e-002	4.60e-001
Methylcyclohexane	6.21e-003	2.68e-001
Benzene	9.90e-003	4.27e-001
Toluene	1.68e-002	7.24e-001
Ethylbenzene	4.09e-003	1.76e-001
Xylenes	1.21e-002	5.21e-001
C8+ Heavies	5.52e-003	2.38e-001
Total Components	100.00	4.31e+003

FLASH GAS EMISSIONS

Flow Rate: 2.25e+003 scfh
Control Method: Combustion Device
Control Efficiency: 98.00

Component	Conc. (vol%)	Loading (lb/hr)
Water	5.99e+001	6.40e+001
Carbon Dioxide	3.96e+001	1.03e+002
Nitrogen	7.37e-002	1.22e-001
Methane	2.13e-001	2.03e-001
Ethane	9.89e-002	1.76e-001
Propane	5.27e-002	1.38e-001
Isobutane	7.79e-003	2.69e-002
n-Butane	2.51e-002	8.64e-002
Isopentane	4.68e-003	2.00e-002
n-Pentane	7.64e-003	3.27e-002
Cyclopentane	9.91e-006	4.12e-005
n-Hexane	1.43e-003	7.33e-003
Cyclohexane	3.15e-004	1.57e-003
Other Hexanes	1.76e-003	9.00e-003
Heptanes	9.66e-004	5.74e-003
Methylcyclohexane	2.15e-004	1.25e-003
Benzene	9.80e-005	4.54e-004
Toluene	1.03e-004	5.61e-004
Ethylbenzene	1.41e-005	8.89e-005
Xylenes	3.00e-005	1.89e-004
C8+ Heavies	8.61e-004	8.69e-003
Total Components	100.00	1.68e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.66e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.46e+001	7.44e+001
Carbon Dioxide	9.83e-002	1.89e-001
Nitrogen	5.48e-003	6.71e-003
Methane	8.08e-001	5.66e-001
Ethane	1.08e+000	1.42e+000
Propane	1.08e+000	2.09e+000

Isobutane	2.09e-001	5.31e-001
n-Butane	8.20e-001	2.08e+000
Isopentane	1.57e-001	4.95e-001
n-Pentane	3.04e-001	9.58e-001
Cyclopentane	1.55e-003	4.75e-003
n-Hexane	8.83e-002	3.32e-001
Cyclohexane	7.60e-002	2.79e-001
Other Hexanes	8.64e-002	3.25e-001
Heptanes	1.04e-001	4.56e-001
Methylcyclohexane	5.94e-002	2.55e-001
Benzene	1.19e-001	4.04e-001
Toluene	1.65e-001	6.64e-001
Ethylbenzene	3.40e-002	1.58e-001
Xylenes	9.76e-002	4.53e-001
C8+ Heavies	2.11e-002	1.57e-001
Total Components	100.00	8.62e+001

CONDENSER PRODUCED WATER STREAM

Temperature: 32.00 deg. F
Flow Rate: 1.49e-001 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	1.00e+002	7.44e+001	999659.
Carbon Dioxide	7.90e-003	5.88e-003	79.
Nitrogen	4.10e-006	3.05e-006	0.
Methane	8.30e-004	6.18e-004	8.
Ethane	3.53e-003	2.62e-003	35.
Propane	1.52e-003	1.13e-003	15.
Isobutane	2.13e-004	1.58e-004	2.
n-Butane	1.11e-003	8.27e-004	11.
Isopentane	1.25e-004	9.28e-005	1.
n-Pentane	2.54e-004	1.89e-004	3.
Cyclopentane	1.01e-005	7.49e-006	0.
n-Hexane	3.42e-005	2.54e-005	0.
Cyclohexane	1.75e-004	1.30e-004	2.
Other Hexanes	3.92e-005	2.91e-005	0.
Heptanes	5.07e-006	3.77e-006	0.
Methylcyclohexane	3.74e-005	2.78e-005	0.
Benzene	1.16e-002	8.66e-003	116.
Toluene	5.34e-003	3.97e-003	53.
Ethylbenzene	3.21e-004	2.39e-004	3.
Xylenes	1.06e-003	7.86e-004	11.
C8+ Heavies	3.45e-009	2.57e-009	0.
Total Components	100.00	7.44e+001	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 32.00 deg. F
Flow Rate: 1.16e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	1.82e-002	8.98e-004

Carbon Dioxide	2.17e-002	1.07e-003
Nitrogen	1.30e-004	6.42e-006
Methane	2.31e-002	1.14e-003
Ethane	2.95e-001	1.45e-002
Propane	3.26e+000	1.61e-001
Isobutane	1.90e+000	9.37e-002
n-Butane	1.12e+001	5.54e-001
Isopentane	5.79e+000	2.85e-001
n-Pentane	1.20e+001	5.90e-001
Cyclopentane	6.65e-002	3.28e-003
n-Hexane	5.77e+000	2.84e-001
Cyclohexane	5.03e+000	2.48e-001
Other Hexanes	5.07e+000	2.50e-001
Heptanes	9.02e+000	4.45e-001
Methylcyclohexane	4.91e+000	2.42e-001
Benzene	7.15e+000	3.52e-001
Toluene	1.30e+001	6.40e-001
Ethylbenzene	3.17e+000	1.56e-001
Xylenes	9.11e+000	4.49e-001
C8+ Heavies	3.18e+000	1.57e-001
Total Components	100.00	4.93e+000

CONDENSER VENT STREAM

Temperature: 32.00 deg. F
Pressure: 14.70 psia
Flow Rate: 6.67e+001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.19e-001	1.96e-002
Carbon Dioxide	2.35e+000	1.82e-001
Nitrogen	1.36e-001	6.70e-003
Methane	2.00e+001	5.65e-001
Ethane	2.66e+001	1.40e+000
Propane	2.48e+001	1.92e+000
Isobutane	4.28e+000	4.37e-001
n-Butane	1.49e+001	1.53e+000
Isopentane	1.65e+000	2.10e-001
n-Pentane	2.90e+000	3.68e-001
Cyclopentane	1.19e-002	1.47e-003
n-Hexane	3.20e-001	4.84e-002
Cyclohexane	2.11e-001	3.12e-002
Other Hexanes	4.98e-001	7.54e-002
Heptanes	6.41e-002	1.13e-002
Methylcyclohexane	7.37e-002	1.27e-002
Benzene	3.15e-001	4.32e-002
Toluene	1.25e-001	2.02e-002
Ethylbenzene	7.28e-003	1.36e-003
Xylenes	1.53e-002	2.84e-003
C8+ Heavies	2.64e-004	7.89e-005
Total Components	100.00	6.89e+000

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 3.23e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	2.07e+001	2.82e-002
Ethane	2.74e+001	7.02e-002
Propane	2.56e+001	9.62e-002
Isobutane	4.42e+000	2.18e-002
n-Butane	1.54e+001	7.63e-002
Isopentane	1.71e+000	1.05e-002
n-Pentane	2.99e+000	1.84e-002
Cyclopentane	1.23e-002	7.34e-005
n-Hexane	3.30e-001	2.42e-003
Cyclohexane	2.18e-001	1.56e-003
Other Hexanes	5.14e-001	3.77e-003
Heptanes	6.62e-002	5.65e-004
Methylcyclohexane	7.60e-002	6.36e-004
Benzene	3.25e-001	2.16e-003
Toluene	1.29e-001	1.01e-003
Ethylbenzene	7.51e-003	6.79e-005
Xylenes	1.57e-002	1.42e-004
C8+ Heavies	2.72e-004	3.95e-006
Total Components	100.00	3.34e-001

ATTACHMENT U

Facility-wide Controlled 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
C001	0.98	4.30	0.83	3.62	9.48	41.37	0.01	0.03	0.07	0.33	0.07	0.33	0.4	1.93	1287.61	5639.73
E009	---	---	---	---	0.34	1.43	---	---	---	---	---	---	---	---	---	---
E010	0.20	0.86	0.16	0.72	0.01	0.05	<0.01	0.01	0.01	0.07	0.01	0.07	<0.01	0.02	234.24	1025.95
E011	0.20	0.86	0.16	0.72	0.01	0.05	<0.01	0.01	0.01	0.07	0.01	0.07	<0.01	0.02	234.24	1025.95
E012	0.20	0.86	0.16	0.72	0.01	0.05	<0.01	0.01	0.01	0.07	0.01	0.07	<0.01	0.02	234.24	1025.95
E013	0.20	0.86	0.16	0.72	0.01	0.05	<0.01	0.01	0.01	0.07	0.01	0.07	<0.01	0.02	234.24	1025.95
E014	0.20	0.86	0.16	0.72	0.01	0.05	<0.01	0.01	0.01	0.07	0.01	0.07	<0.01	0.02	234.24	1025.95
E015	0.20	0.86	0.16	0.72	0.01	0.05	<0.01	0.01	0.01	0.07	0.01	0.07	<0.01	0.02	234.24	1025.95
E016	0.10	0.43	0.08	0.36	0.01	0.02	<0.01	<0.01	0.01	0.03	0.01	0.03	<0.01	0.01	117.12	512.98
E017	0.10	0.43	0.08	0.36	0.01	0.02	<0.01	<0.01	0.01	0.03	0.01	0.03	<0.01	0.01	117.12	512.98
E018	1.52	6.66	0.64	2.80	1.86	8.13	0.01	0.03	0.10	0.44	0.10	0.44	0.02	0.10	1443.31	6321.71
E019	1.52	6.66	0.64	2.80	1.86	8.13	0.01	0.03	0.10	0.44	0.10	0.44	0.02	0.10	1443.31	6321.71
E020	0.23	0.99	0.91	3.98	0.08	0.36	<0.01	<0.01	0.03	0.14	0.03	0.14	<0.01	0.02	233.64	1023.33
E021	0.06	0.25	0.12	0.51	0.08	0.35	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	-0.29
E023	0.07	0.32	0.06	0.27	0.24	1.06	<0.01	<0.01	0.01	0.02	0.01	0.02	0.03	0.13	88.73	388.62
Fugitives	---	---	---	---	---	18.46	---	---	---	---	---	---	---	20.44	---	511.18
Blowdowns	---	---	---	---	---	4.12	---	---	---	---	---	---	---	7.42	---	185.51
Haul Roads	---	---	---	---	---	---	---	---	---	5.22	---	0.52	---	---	---	---
TOTAL	5.76	25.21	4.34	19.02	14.01	83.74	0.03	0.12	0.42	7.06	0.42	2.35	0.55	30.27	6136.32	27573.77
TOTAL (without fugitive)	5.76	25.21	4.34	19.02	14.01	61.15	0.03	0.12	0.42	1.83	0.42	1.83	0.55	2.41	6136.32	26877.07

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
C001	---	---	0.01	0.02	0.01	0.04	<0.01	0.01	0.01	0.03	0.30	1.31	0.34	1.41
E009	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.04	0.02	0.05
E010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	---	---	---	<0.01	0.02	<0.01	0.02
E011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	---	---	---	<0.01	0.02	<0.01	0.02
E012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	---	---	---	<0.01	0.02	<0.01	0.02
E013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	---	---	---	<0.01	0.02	<0.01	0.02
E014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	---	---	---	<0.01	0.02	<0.01	0.02
E015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	---	---	---	<0.01	0.02	<0.01	0.02
E016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	---	---	---	<0.01	0.01	<0.01	0.01
E017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	---	---	---	<0.01	0.01	<0.01	0.01
E018	0.30	1.33	<0.01	0.02	<0.01	0.02	<0.01	<0.01	<0.01	0.01	---	---	0.50	2.19
E019	0.30	1.33	<0.01	0.02	<0.01	0.02	<0.01	<0.01	<0.01	0.01	---	---	0.50	2.19
E020	0.03	0.12	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	---	0.05	0.21
E021	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E023	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	0.03
Fugitives	---	---	---	0.01	---	0.01	---	0.01	---	0.01	---	0.39	---	0.42
Blowdowns	---	---	---	<0.01	---	<0.01	---	<0.01	---	<0.01	---	0.09	---	0.09
Haul Roads	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	0.64	2.79	0.02	0.09	0.03	0.10	0.01	0.02	0.02	0.07	0.34	1.95	1.43	6.70
TOTAL(without fugitives)	0.64	2.79	0.02	0.08	0.03	0.08	0.01	0.02	0.02	0.05	0.34	1.47	1.43	6.18

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

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Triad Hunter, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a G70-D General Permit Registration for a natural gas production facility located on 4883 Tyler HWY (SR18) in Sistersville, WV 26175, in Tyler County, West Virginia. The latitude and longitude coordinates are: Latitude 39.53519°, Longitude -80.92280°.

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

Pollutant	Emissions (tons per year)
Nitrogen Oxides	25.21
Carbon Monoxide	19.02
Volatile Organic Compounds	61.15
Particulate Matter – 10/2.5	1.83
Sulfur Dioxide	0.12
Formaldehyde	2.79
Total HAP	6.70

Startup of operation is planned to begin on or about the first day of April, 2018. 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 1st day of November, 2017.

By: Triad Hunter, LLC
Daren Rader
Manager - Operations Unconventional
125 Putnam Street
Marietta, Ohio 45750

ATTACHMENT W

General Permit Registration Application Fee