April 10, 2018

Mr. William F. Durham
Director
WVDEP, Division of Air Quality
601 – 57th Street SE
Charleston, West Virginia 25304

Re: Nytis Exploration Company, Rule 13 Permit Modification and Title V Permit Application Staten Run Compressor Station – Facility ID 039 - 00044

Dear Mr. Durham,

Nytis Exploration Company (Nytis) and SLR International Corporation (SLR) have prepared the attached Rule 13 Permit Modification and Title V Permit Application for Staten Run Compressor Station located in Kanawha County, West Virginia. This modification addresses the following:

Changes incorporated under the Rule 13 Modification portion of this Application

- Increase VOC and PM emissions for Emission Unit ID #4 (AJAX DPC 120) based on updated emission factors;
- Increase in VOC emissions associated with the dehydration unit (RSV-1) due to changes in gas composition;
- Addition of two produced liquids storage tanks (T05 & T06) and emissions associated with the new storage tanks as well as an increase in the existing produced liquids storage tank (T03) emissions based on a new annual throughput; and
- Addition of emissions associated with operations at the site due to truck loading emissions, (TL-1) and compressor blowdown venting emissions (Blowdowns).

Changes incorporated under the Title V Permit portion of this Application

Increase NOx and VOC emissions for Emission Unit IDs #1 and #2 (CAT 398-SI Compressor Engines) based on updated specifications;

The station's potential to emit (PTE) has been updated and new emission limits are proposed. The proposed emission limits will trigger new permitting program requirements for the Staten Run Station as an active Title V Major Source.

The public notice will be submitted to *The Charleston Gazette* for publication. The legal advertisement will be forwarded to your office as soon as SLR receives the original affidavit from the newspaper.

If any additional information is needed, please feel free to contact me by telephone at (304) 932-3107 or by e-mail at nlanham@slrconsulting.com

Sincerely,
SLR International Corporation

Nathaniel L. Lanham
WV Operations Manager

Nytis Exploration Company LLC

Staten Run Compressor Station

Montgomery, West Virginia

Rule 13 Permit Modification Application

SLR Ref: 116.01914.00021

April 2018

Rule 13 Permit Modification Application

Prepared for:

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia 25086

This document has been prepared by SLR International Corporation. The material and data in this permit application were prepared under the supervision and direction of the undersigned.

Chris Boggess
Associate Engineer

Nathaniel L. Lanham.
West Virginia Operations Manager

NYTIS
EXPLORATION COMPANY

CONTENTS

ATTACHMENTS

Notes:

ATTACHMENT C – N/A – Application addresses permit coverage of already installed equipment
ATTACHMENT M – N/A – No change to APCD associated with this permit modification
ATTACHMENT Q – N/A – No information contained within this application claimed as confidential
ATTACHMENT R – N/A – No delegation of authority necessary

APPLICATION FOR PERMIT

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☐ **CONSTRUCTION** ☒ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☒ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☒ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Nytis Exploration Company LLC

2. Federal Employer ID No. ***(FEIN):***
82-1462663

3. Name of facility *(if different from above):*
Staten Run Compressor Station

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
102 3rd Street,
Glasgow, WV 25086

5B. Facility's present physical address:
Off U.S. Route 60 near
Montgomery, WV

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

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

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

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

- If **YES,** please explain: **The applicant owns the site**
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): **Natural Gas Compressor Station with TEG Dehydration Unit.**

10. North American Industry Classification System **(NAICS)** code for the facility:
211111

11A. DAQ Plant ID No. (for existing facilities only):
039-00044

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R13-2863A

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

12A.

– For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;

Traveling southeast on US Route 60 from Glasgow, WV, travel approximately 7.2 miles towards Montgomery. The station gate is on US Route 60 on the left hand side of the road. The station is located approximately 0.2 miles from the gate.

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

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
N/A	Montgomery	Kanawha County
12.E. UTM Northing (KM): 4,226.742	12F. UTM Easting (KM): 471.779	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:

This permit modification application will address an increase in VOC and PM emissions associated with Compressor Engine #4 based on more accurate emission factors. The modification will also address an increase in VOC emissions from the dehydration unit due to changes in gas composition. In addition to the increase in emissions from existing Rule 13 equipment the permit application will also address the addition of already installed equipment at the site that was not previously covered under the last permit. Lastly, the Rule 13 permit modification will address an increase in NOx and VOC emissions from two grandfathered sources (Compressor Engines #1 and #2) based on manufacturer's emission factors.

14A. Provide the date of anticipated installation or change: / / – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: **03/2018**	14B. Date of anticipated Start-Up if a permit is granted: / /

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:

Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

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

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

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**

– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**

– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

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

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify: **Internal Combustion Engine Data Sheet, Small Reboilers Data Sheet, Glycol Dehydration Unit Data Sheet, Tanker Truck Loading Data Sheet**

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☐ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33**. Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

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

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE Lloyd A Hall *(Please use blue ink)* DATE: 4/9/18 *(Please use blue ink)*

35B. Printed name of signee: Lloyd A. Hall		35C. Title: Vice President of Operations
35D. E-mail: lhall@nytisky.com	36E. Phone: 859-299-0771, EXT 301	36F. FAX: 859-299-0772
36A. Printed name of contact person (if different from above): Jesse Hanshaw, P.E.		36B. Title: Principal Engineer SLR International Corporation
36C. E-mail: jhanshaw@slrconsulting.com	36D. Phone: 681-205-8949	36E. FAX: 681-205-8969

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☐ **Attachment C: Installation and Start Up Schedule**
- ☒ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☒ **Attachment H: Material Safety Data Sheets (MSDS)**
- ☒ **Attachment I: Emission Units Table**
- ☒ **Attachment J: Emission Points Data Summary Sheet**
- ☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☐ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☐ **Attachment Q: Business Confidential Claims**
- ☐ **Attachment R: Authority Forms**
- ☒ **Attachment S: Title V Permit Revision Information**
- ☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

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

ATTACHMENT A

BUSINESS CERTIFICATE

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
NYTIS EXPLORATION COMPANY LLC
1700 BROADWAY 1170
DENVER, CO 80290-1704

BUSINESS REGISTRATION ACCOUNT NUMBER: **1010-1965**

This certificate is issued on: 12/13/2012

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.4
L0401857920

ATTACHMENT B

MAP

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

Attachment B - Area Map

Nytis Exploration Company LLC
Staten Run Compressor Station - Facility ID: 039-00044

UTM Coordinates of Site:
Northing:4,226.742 km, Easting: 471.779 km, Zone: 17

ATTACHMENT C

INSTALLATION AND STARTUP SCHEDULE

NOT APPLICABLE (SEE NOTES)

Application addresses permit coverage of already installed equipment

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

ATTACHMENT D

REGULATORY DISCUSSION

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

REGULATORY DISCUSSION

APPLICABLE REGULATIONS

The changes associated with this Permit Application will increase the facility's NOx Potential to emit (PTE) estimated level above the 45CSR30 (Title V) major source threshold: updated PTE =~180 tons/year. This Rule 13 Modification and Title V Permit Application will re-establish active Title V Status for the Staten Run Station and be subject to 45CSR30 permitting requirements. The updated emissions associated with the proposed permit modification are subject to the following applicable rules and regulations:

Federal and State:

45 CSR 2 – *To Prevent and Control Particulate Air Pollution Control from Combustion of Indirect Heat Exchangers*

The indirect heat exchanger consists of the dehydration reboiler burner, which is subject to the visible emission standard of §45-2-3 as follows:

3.1. No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.

However, in accordance with the exemptions defined with §45-2-11 these sources have limited requirements as follows:

11.1. Any fuel burning unit(s) having a heat input under ten (10) million B.T.U.'s per hour will be exempt from sections 4, 5, 6, 8 and 9. However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

45 CSR 4 – *To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors*

45 CSR 11 – *Prevention of Air Pollution Emergency Episodes*

45 CSR 13 – *Permits for Construction, Modification, Relocation, and Operation of Stationary Source of Air Pollutants*

This proposed permit modification will address updated emission factors for theAjax DPC 120, 4SRB engine (Emission Unit CE-4) with t. In addition to this change the application will also address an increase in HAP and VOC emission associated with the dehydration unit due to changes in the gas composition since the last permit issuance. . Lastly in regards to proposed changes, the Rule 13 portion of this application will

include fugitive emissions associated with truck loading emissions (TL-1) and blowdown venting emissions (Blowdowns) from the compressor engines on site.

45 CSR 17 – *To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Particulate Matter*

45 CSR 30 – *Requirements for Operating Permits – Title V of the Clean Air Act*

The updated potential to emit (PTE) emission estimates prove the NOx to exceed 100 TPY (~180 TPY) for Staten Run Station; therefor, this facility meets the emission threshold to trigger a 45 CSR 30 Title V Operating Permit and is it subject to those Federal Standards.

40 CFR 63 Subpart HH – *NESHAP from Oil and Natural Gas Production Facilities*

The TEG Dehydration Unit is subject to the area source requirements of this subpart and complies by controlling the actual emissions with a BTEX Condenser.

40 CFR 60 Subpart OOOO – *Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution*

Reciprocating Compressor Packing

The reciprocating compressor associated with emission unit (CE-4) will be subject to the rod packing standards of §60.5385 that require them to be replaced/rebuilt every 26,000 hrs or 3 years. Records shall be maintained based on months or hours of operations since initial startup and each subsequent rebuild or replacement of the compressor's rod packing.

40 CFR 63 Subpart ZZZZ – *NESHAP for Stationary Reciprocating Internal Combustion Engines*

Emission Units CE-1, CE-2, CE-3, and CE-4, are all subject to Subpart ZZZZ and maintains compliance with the existing source work practice standards in accordance with §63.6640, Table 2d (Line 7) and Table 6 (Line 9) of Subpart ZZZZ. The reporting and recordkeeping requirements pertaining to this engine are in accordance with §63.6655.

NON-APPLICABILITY DETERMINATIONS

The following requirements have been determined "not applicable" to this modification application due to the following:

45 CSR 6 - *To Prevent and Control Air Pollution from Combustion of Refuse*

This state rule is geared towards reducing particulate matter emissions from the combustion of refuse and is specific to burning solid waste such as trash as well as combustion of waste gas in flares. The rule sets PM limits and establishes a 20%

visible emission limit, both of which shouldn't be any problem for a gas fired flare to meet, however the site does not operate a flare and therefore is not subject to the rule.

45 CSR 10 – *To Prevent and Control Air Pollution from the Emission of Sulfur Oxides*

The fuel burning unit utilized at this site is exempt from Sections 4 and 5 of this rule because the site does not meet the definition of manufacturing process or refinery process.

45 CSR 21 – *To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds*

The station is not engaged in the extraction or fractionation of natural gas which exempts the facility from 45CSR§21-29. No other VOC standards would apply to the emission units at this facility.

45 CSR 27 – *To Prevent and Control the Emissions of Toxic Air Pollutants*

Natural Gas is included as a petroleum product and contains less than 5% benzene by weight. 45CSR§27-2.4 exempts equipment "used in the production and distribution of petroleum products providing that such equipment does not produce or contact materials containing more than 5% benzene by weight". A representative wet gas analysis taken in 2017 shows the weight percent of benzene to be less than 0.02%.

40 CFR 60 Subpart Dc – *Standards of Performance for Steam Generating Units*

The dehydration reboiler at this facility is rated at below 10 million BTU/hr; hence, Subpart Dc is not applicable in accordance with §60.40c(a)

40 CFR 60 Subpart Kb – *Standards of Performance for Volatile Organic Liquid Storage Vessels*

This subpart does not apply because the storage vessels are below 75m^3 (19,813 gallons) in capacity as specified in 60.11(b).

40 CFR 60 Subpart KKK – *Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plant*

This subpart is not applicable because this station is not engaged in the extraction or fractionation of natural gas liquids from field gas, the fractionation of mixed natural gas liquids to natural gas products, or both.

40 CFR 60 Subpart IIII – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*

There are no compression ignition engines at this facility; therefore this Subpart is not applicable.

40 CFR 60 Subpart JJJJ – *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*
All engines at this facility were manufactured pre June 12, 2006 applicability date listed in 60.4230(a)(4).

Reconstruction Costs were evaluated for each of the Compressor Engines and none exceed the fifty percent thresholds that would have re designated those units subject to Subpart JJJJ re-constructed regulatory standards.
40 CFR 60 Subpart OOOO – *Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution*

Storage Vessel NSPS
This subpart is not applicable because the storage vessels at this facility were installed prior to the NSPS applicability date of August 23, 2011.

40 CFR 60 Subpart OOOOa – *Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced after September 18, 2015*

The GHG and VOC requirements defined by this NSPS are not applicable to this site because all affected sources commenced construction, modification, or reconstruction prior to September 18, 2015 in accordance with [40CFR§60.5365a]

40 CFR 63 Subpart HHH – *NESHAP from Natural Gas Transmission and Storage Facilities*

This subpart is related to Natural Gas Transmission Facilities that are major sources of HAP emissions. Therefore, this subpart does not apply to this site since it is a defined as a minor source of HAPs

40 CFR 63 Subpart DDDDD – *NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters*

This subpart is not applicable because this facility is not a major source of HAPs as defined in §63.7575.

40 CFR 63 Subpart JJJJJJ – *NESHAP for Industrial, Commercial, and Institutional Boilers Area Sources*

This subpart is not applicable since there are no steam generating boilers at this facility as defined in §63.11195.

ATTACHMENT E

PLOT PLAN

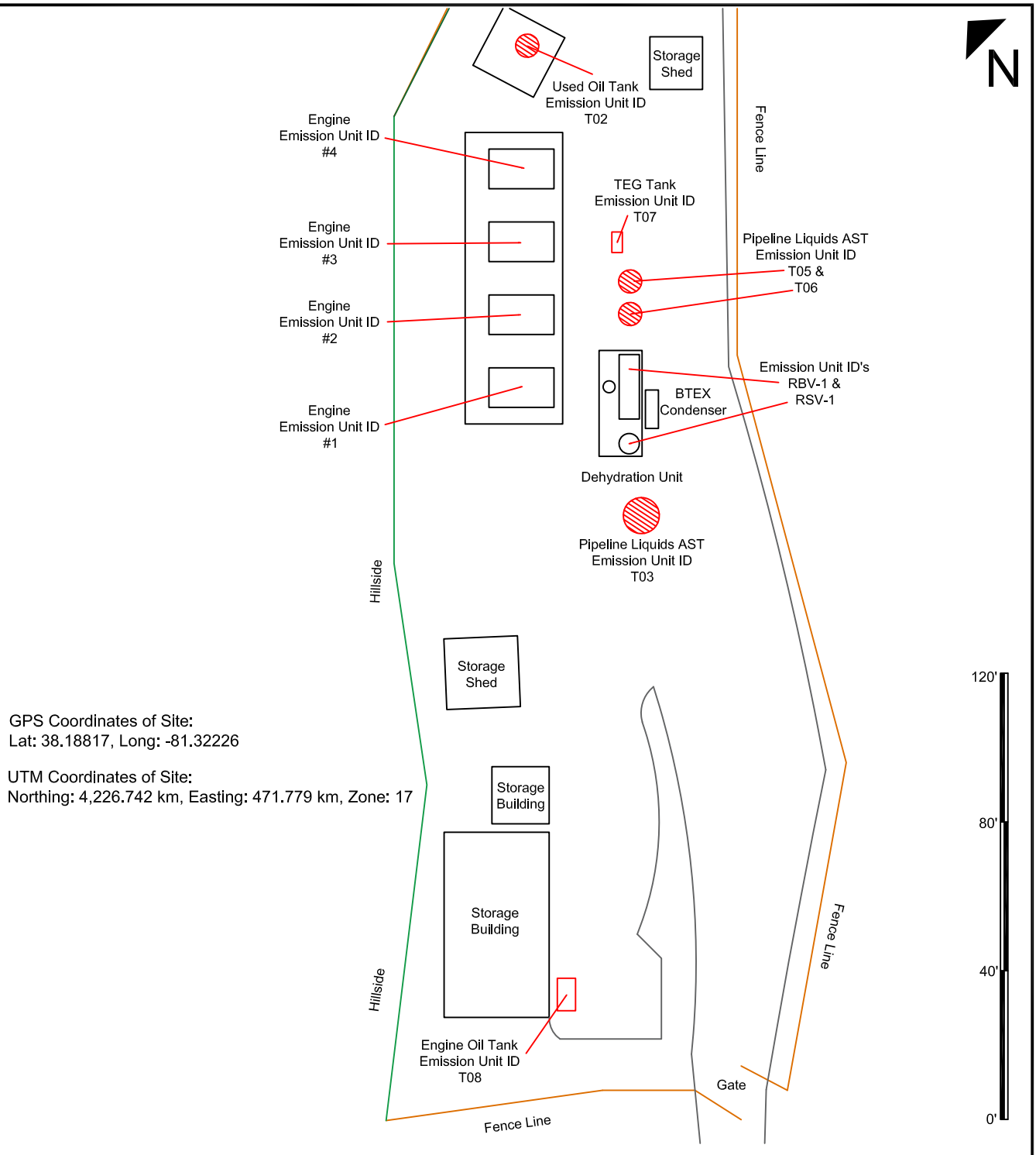
Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018



GPS Coordinates of Site:
Lat: 38.18817, Long: -81.32226

UTM Coordinates of Site:
Northing: 4,226.742 km, Easting: 471.779 km, Zone: 17

DRAWING LEGEND

- O/H Electric Line
- Utility Pole
- Piping (above ground)
- Piping (under ground)
- Valve
- Plug
- Tree/Brush line
- Crushed Stone Pad
- Storage Tank
- Secondary Containment Area
- Direction of Surface Runoff
- (W) Well Head
- (M) Meter
- (S) Separator
- (D) Drain
- (C) Compressor
- (RM) Residential Meter
- (DRIP) Drip Tank

SLR

Nytis Exploration Company LLC
102 3rd St.
Glasgow, WV 25086

Report:
WV NSR Rule 13 Permit Application
Staten Run Compressor Station

Drawing	Drawn By:
Plot Plan	CLB

Date: April 2018	Attachment E
	Project #: 116.01914.00021

ATTACHMENT F

PROCESS FLOW DIAGRAM

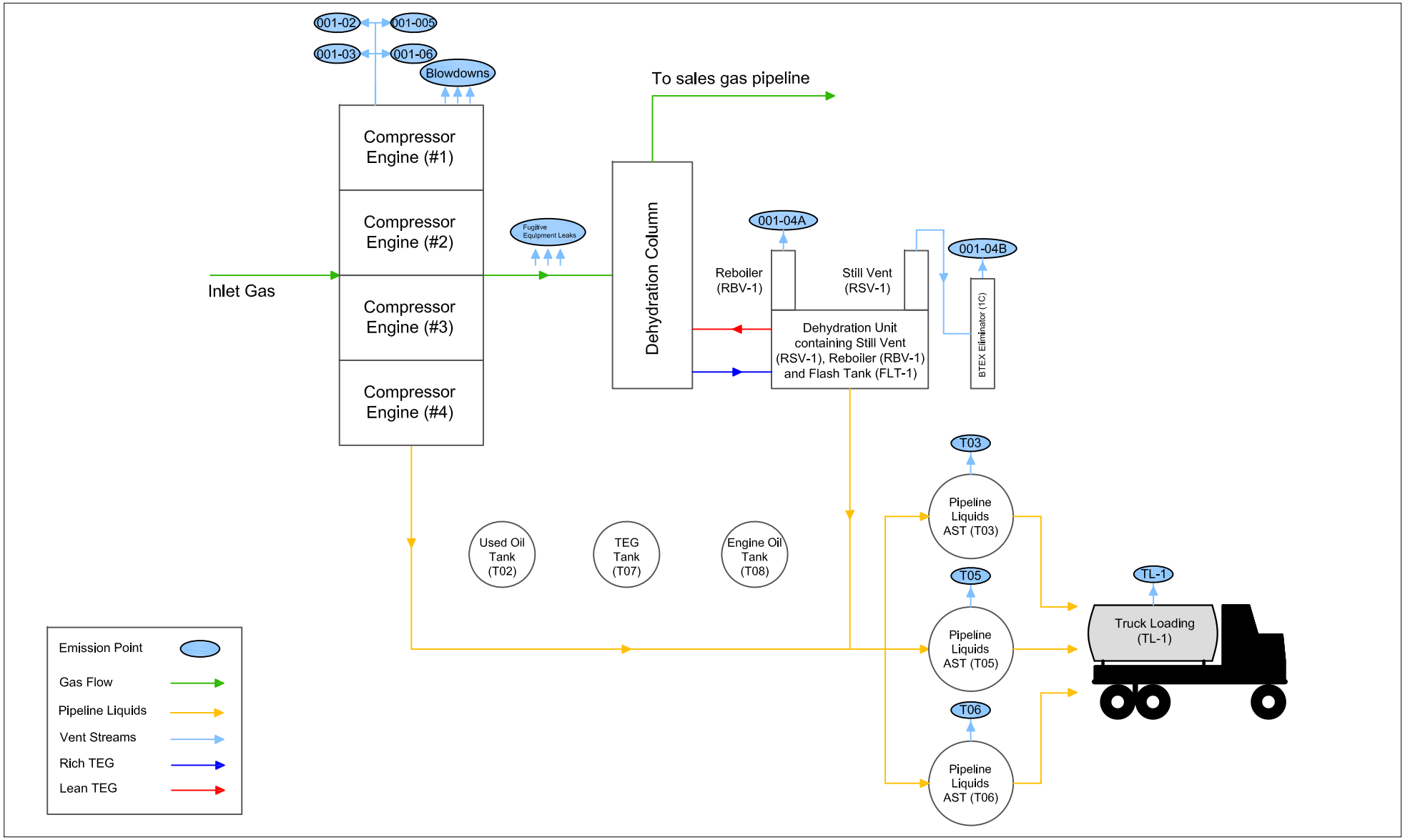
Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018



SLR

Nytis Exploration Company LLC

Attachment F - Process Flow Diagram

Staten Run Compressor Station

April 2018

ATTACHMENT G

PROCESS DESCRIPTION

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

PROCESS DESCRIPTION

Introduction

Staten Run Compressor Station (Facility ID 039-00044) currently operates under West Virginia Rule 13 Permit R13-2863A. On behalf of Nytis Exploration Company (Nytis), SLR is requesting to modify the current permit to reflect updated emission factors that have increased the facility potential to emit (PTE) limitations for particulate matter (PM), NOx, and VOC (NMEHC).

After updating the PTE calculations for the existing CAT 398 compressor engines based on new emission factors provided by the manufacturer, as advised by the WVDEP DAQ, the station exceeds Title V Major Source emission thresholds. This application will update the station's Title V permit status to active and subject to 45CSR30. The facility was permitted as a Major Source under Title V until April of 2011, at which time the Title V permit was placed in inactive status following the facility's HAP emission levels decreasing below the 45CSR30 major source thresholds due to the addition of a BTEX Condenser and decrease of facility throughput capacity..

Facility Description

Staten Run Station is a natural gas compressor station that includes four natural gas compressor engines, one triethylene glycol (TEG) dehydration unit consisting of a reboiler, still column and BTEX Eliminator condenser control device, one pipeline liquids storage tank, two oil tanks and a glycol storage tank, all permitted under Rule 13. The station's primary use is to compress and dehydrate natural gas received via pipeline to be delivered downstream to end users.

Natural gas enters the facility via pipeline(s) and is raised to a higher pressure by the AJAX DPC 120 compressor engine. Before the second stage of compression, the natural gas is processed by a TEG dehydration unit. The dehydration unit uses TEG to absorb water from the natural gas by contacting the wet gas in a contacting tower. the rich (wet) TEG leaves the tower and is routed through the BTEX Eliminator condenser prior to being routed to a flash tank and system reboiler. The reboiler regenerates the rich TEG for re-use in the contacting tower. Condensate, with trace TEG is drained from the BTEX condenser to storage. Dehydrated gas leaves the tower and is then compressed a second time by two Caterpillar 398 Compressor Engines and one Cooper GMX-A6 Compressor Engine

Proposed Update

This permit modification application will involve the following changes;

Changes incorporated under the Rule 13 Modification portion of this Application

- Increase VOC and PM emissions for Emission Unit ID #4 (AJAX DPC 120) based on updated emission factors;
- Increase in VOC emissions associated with the dehydration unit (RSV-1) due to changes in gas composition;
- Addition of two produced liquids storage tanks (T05 & T06) and emissions associated with the new storage tanks as well as an increase in the existing produced liquids storage tank (T03) emissions based on a new annual throughput; and
- Addition of emissions associated with operations at the site due to truck loading emissions, (TL-1) and compressor blowdown venting emissions (Blowdowns)

Changes incorporated under the Title V Permit portion of this Application

Increase NOx and VOC emissions for Emission Unit IDs #1 and #2 (CAT 398-SI Compressor Engines) based on updated specifications;

The station's potential to emit (PTE) has been updated and new emission limits are proposed. The proposed emission limits will trigger new permitting program requirements for the Staten Run Station as an active Title V Major Source.

ATTACHMENT H

SAFETY DATA SHEETS (SDS)

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

SAFETY DATA SHEET

Date Issued : 9-6-2013
SDS No : 0002WV
Date Revised : 9-6-2013
Revision No : 01

Sweet Produced Water
(West Virginia)

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Sweet Produced Water (West Virginia)
GENERAL USE: Water extracted from natural gas well production.

DISTRIBUTOR

24 HR. EMERGENCY TELEPHONE NUMBERS
1-800-642-0300

2. HAZARDS IDENTIFICATION

This material is not considered hazardous according to OSHA criteria.

3. COMPOSITION / INFORMATIO N ON INGREDIENTS

Chemical Name	Vol. %	CAS
Water	>90	7732-18-5
Sodium Chloride	<10	7647-14-5

COMMENTS: Compositions given are typical values, not specifications. Composition may vary with geographic location, geologic formation, temperature and pressure.

4. FIRST AID MEASURES

EYES: Immediately flush with large amounts of water, holding eyelids open, for at least 20 minutes. Repeat if necessary. Remove contact lenses, if present and easy to do. If pain or redness persists, seek medical attention. If eye is exposed to hot liquid, cover eyes with cloth and seek medical attention immediately.

SKIN: In case of hot liquid exposure, do not remove clothing or treat, wash only unburned area and seek medical attention immediately.

INGESTION: Do not induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Have exposed individual rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Obtain medical assistance immediately and treat as directed by a medical professional.

INHALATION: Move victim to fresh air. Call 911, emergency medical service,

NOTES: Contact poison treatment center immediately if large quantities have been ingested or inhaled.

5. FIRE FIGHTING MEASURES

FLASH POINT: N/A

FLAMMABLE LIMITS: 0

FIRE FIGHTING PROCEDURES: PROTECTIVE ACTIONS TO TAKE DURING FIRE FIGHTING - Move containers from fire area if you can do it without risk. Dike fire-control water for later disposal; do not scatter the material. Do not get water inside containers.

FIRE FIGHTING EQUIPMENT: PRECAUTIO NS FOR FIRE INVOLVING TANKS OR CAR/TRAILER LOADS - Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: For emergency information and procedures to follow in the case of an accidental release, call the Emergency Telephone Number(s) listed in Section 1 of this SDS. As an immediate precautionary measure, isolate spill or leak area 50 meters (160 feet) in all directions. Keep unauthorized personnel away. Do not touch or walk through spilled material. 7Stop leak if you can do it without risk. Prevent entry into waterways, sewers. Dike far ahead of liquid for later disposal. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

LARGE SPILL: Use similar response procedures as indicated under Small Spill. Large releases may require the notification of local emergency response agencies.

7. HANDLING AND STORAGE

GENERAL PROCEDURES: Handle in accordance with good industrial hygiene and safety practices. These practices include but are not limited to avoiding unnecessary exposure and prompt removal of material from eyes, skin and clothing. Wash exposed skin and clothing frequently. If needed, take first aid actions as indicated in Section 4 of this SDS.

HANDLING: Wear appropriate personal protective equipment and use exposure controls as indicated in Section 8. Avoid all contact with skin and eyes. Avoid breathing product dust or vapors. Wash with soap and water after working with this product.

STORAGE: Keep in airtight container away from all heat sources. Store in a segregated and approved area. Store in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Keep container in a well-ventilated area. Ground all containers during transfer. Store in the original container or an approved alternative made from compatible material. Do not store in unlabeled containers. Treat empty containers in a similar fashion as residual product may exist. Use appropriate containment to avoid environmental contamination.

STORAGE TEMPERATURE: Store containers of product in cool well ventilated location.

STORAGE PRESSURE: Store in a room with ambient pressure.

ELECTROSTATIC ACCUMULATION HAZARD: Not Established.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE GUIDELINES

OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)			
		EXPOSURE LIMITS	
		OSHA PEL	ACGIH TLV
Chemical Name		ppm	ppm
Sodium Chloride	TWA	N/E	N/E
	STEL	N/E	N/E

ENGINEERING CONTROLS: Provide adequate general and local ventilation to maintain airborne chemical concentrations below applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Employees should be provided with and required to use splash-proof safety goggles and full face splash shields where there is any possibility of product coming in contact with eyes. Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of contact lenses. Ensure that eye wash station is operable and nearby.

SKIN: Consider wearing long-sleeve, FRC, otherwise normal working clothes should be worn. Wash contaminated clothing prior to reuse. If gloves are required for job operations involving this product, wear nitrile rubber or butyl rubber gloves.

RESPIRATORY: Respiratory protection is normally not required except in emergencies or when conditions cause excessive airborne levels of mists or vapors. Select NIOSH-approved organic vapor air-purifying respirator, SCBA or air-supplied respirator where there may be potential for overexposure.

PROTECTIVE CLOTHING: Long sleeve shirt and long pants or coveralls. Consider wearing butyl rubber apron or outerwear where splashing may occur. Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire.

WORK HYGIENIC PRACTICES: Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove contaminated clothing and launder before reuse. Shower after work using plenty of soap and water.

COMMENTS: EXPOSURE LIMITS & SOURCES - Refer to Section 16 Table 1 for additional exposure limits and sources for this product or its components, whichever applies.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR: Salty.
APPEARANCE: Clear or opaque liquid.
pH: 7.26 to 7.75
PERCENT VOLATILE: Negligible.
VAPOR PRESSURE: Not Established.
VAPOR DENSITY: >1.0 (Air = 1)
BOILING POINT: 212° F / 100° C
FREEZING POINT: < 0°C (<32°F)
POUR POINT: Not Established.
FLASH POINT: Not Applicable
LOWER EXPLOSIVE LIMITS: Not Applicable
SOLUBILITY IN WATER: Not Established.
EVAPORATION RATE: Not Established.
SPECIFIC GRAVITY: > 1.000 at 0°C (32°F)
VISCOSITY: Not Established.
COEFF. OIL/WATER: Not Established.
ODOR THRESHOLD: Not Established.

10. STABILITY AND REACTIVITY

STABLE: Yes
HAZARDOUS POLYMERIZATIO N: No
STABILITY: CHEMICAL STABILITY - This product is anticipated to be stable under normal ambient storage and handling conditions of temperature and pressure.
POLYMERIZATION: This product is not anticipated to cause hazardous reactions or polymerizations under normal ambient storage and handling conditions of temperature and pressure.
CONDITIONS TO AVOID: Avoid contact with incompatible materials such as heat.

11. TOXICOLOGICAL INFORMATION

ACUTE

Chemical Name	ORAL LD_{50} (rat)	DERMAL LD_{50} (rabbit)	INHALATION LC_{50} (rat)
Sodium Chloride	3000 mg/kg	N/E	N/E

EYE EFFECTS: May cause moderate to severe eye irritation.
SKIN EFFECTS: May cause mild skin irritation. Prolonged or repeated contact may result in mild irritation.
CHRONIC: Not Established.
CARCINOGENICITY: Not expected to cause cancer. This substance is not listed as a carcinogen by IARC, NTP, or OSHA.
SENSITIZATION: This product is not expected to be a skin sensitizer.
NEUROTOXICITY: Not Established.
GENETIC EFFECTS: Not Established.
REPRODUCTIVE EFFECTS: Not Established.
TERATOG ENIC EFFECTS: Not Established.
MUTAGENICITY: Not Established.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA: MOBILITY IN SOIL POTENTIAL - Not Established.

BIOACCUMULATION/ACCUMULATION: Not Established.

DISTRIBUTIO N: Do not discharge into or allow runoff to flow into sewers and natural waterways. Contain spill material and dike for proper disposal.

AQUATIC TOXICITY (ACUTE): This product is not expected to be harmful to aquatic life.

96-HOUR LC_{50}: 3930 - 5360 mg/L Pimephales promelas for calcium chloride.

48-HOUR EC_{50}: 52 mg/L for Daphnia magna for calcium chloride.

CHEMICAL FATE INFORMATION: PERSISTENCE & DEGRADABILITY - Not Established.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: This product is not a listed hazardous waste.

EMPTY CONTAINER: Offer rinsed packaging material to local recycling facilities.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATIO N)

Not Regulated

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

311/312 HAZARD CATEGORIES: Fire hazard. Immediate (acute) health hazard. Delayed (chronic) health hazard.

FIRE: No **PRESSURE GENERATING:** No **REACTIVITY:** No **ACUTE:** No **CHRONIC:** No

EPCRA SECTION 313 SUPPLIER NOTIFICATION

This material does not contain any chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372.

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

This material does not contain any chemicals with CERCLA Reportable Quantities.

TSCA (TOXIC SUBSTANCE CONTROL ACT)

All components are either listed on the TSCA Inventory, or are not regulated under TSCA.

CALIFORNIA PROPOSITION 65

This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects, or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

16. OTHER INFORMATIO N

RELEVANT R-PHRASES:

R36/37/38: Irritating to eyes, respiratory system and skin.
R36/38: Irritating to eyes and skin.
R65: Harmful: may cause lung damage if swallowed.

PREPARED BY: SLR International Corporation

REVISION SUMMARY:

NATIONAL FIRE PROTECTION ASSOCIATION® HAZARD RATING

HEALTH:	0-Hazard No greater than Ordinary Material
FIRE:	0-Will Not Burn
REACTIVITY:	0- Stable

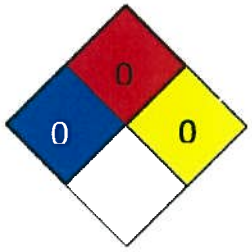
HAZARDOUS MATERIAL IDENTIFICATION SYSTEM® HAZARD RATING

HEALTH:	0- Minimal Hazard
FIRE:	0- Minimal Hazard
PHYSICAL:	0- Minimal Hazard

HMIS RATING

HEALTH	0
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	B

NFPA CODE



ADDITIONAL MSDS INFORMATION:

KEY / LEGEND

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous Goods by Road
CAA - Clean Air Act
CAS - Chemical Abstracts Service Registry Number
CDG - Carriage of Dangerous Goods by Road and Rail Manual
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
CFR - Code of Federal Regulations
EINECS - European Inventory of Existing Chemical Substances Registry Number
NAERG - Emergency Response Guidebook
EPCRA - Emergency Planning and Community Right-to-Know Act
GHS - Globally Harmonized System of Classification and Labeling of Chemicals
IARC - International Agency for Research on Cancer
IATA - International Air Transport Association
ICAO - International Civil Aviation Organization
IMDG - International Maritime Dangerous Goods Code
IMO - International Maritime Organization
MSDS - Material Safety Data Sheet
N/E - Not Established
NOV - National Oil well Varco
NTP - National Toxicology Program
OSHA - Occupational Safety and Health Administration
PEL - Permissible Exposure Limit
PPE - Personal Protective Equipment
RCRA - Resource Conversation and Recovery Act
RID - Regulations Concerning the International Transport of Dangerous Goods by Rail
RQ - Reportable Quantities
SARA - Superfund Amendments and Reauthorization Act of 1986
SDS - Safety Data Sheet
TCC - Tag Closed Cup
TDG - Transportation of Dangerous Goods
TLV - Threshold Limit Value
TSCA - Toxic Substance Control Act
UN/NA - United Nations / North American Number
UNECE - United Nations Economic Commission for Europe
US DOT - United States Department of Transportation
US EPA - United States Environmental Protection Agency
Vol. - Volume
WHMIS - Workplace Hazardous Materials Information System

GENERAL STATEMENTS: Other information not included anywhere else in this SDS is included in this section if, in fact, such data exists.

MANUFACTURER DISCLAIMER: This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. NO WARRANTY OF MERCANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION HEREIN PROVIDED. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

SAFETY DATA SHEET

Date Issued : 9-6-2013
SDS No : 0001WV
Date Revised : 9-6-2013
Revision No : 01

Natural Gas Condensate
Petroleum (West Virginia)

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Natural Gas Condensate
GENERAL USE: Condensate extracted from natural gas well production.

DISTRIBUTOR

24 HR. EMERGENCY TELEPHONE NUMBERS
1-800-642-0300

2. HAZARDS IDENTIFICATION

GHS CLASSIFICATIONS

Health
Carcinogenicity, Category 1 Eye Irritant, Category 2B Skin Irritant, Category 2

GHS LABEL

<table>
<tr>
<td> 
WARNING
H320: Causes eye irritation.
H315: Causes skin irritation.</td>
<td> 
DANGER
H350: May cause cancer.</td>
</tr>
<tr>
<td> 
DANGER
H226 Flammable Liquid and Vapor</td>
<td></td>
</tr>
<tr>
<td colspan="2">PRECAUTIONARY STATEMENT(S)
Prevention:
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P281: Use personal protective equipment as required.
P264: Wash thoroughly after handling.
P280:: Wear protective gloves.
Response:
P308+P313: IF exposed or concerned: Get medical advice/attention.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313: If eye irritation persists: Get medical advice/attention.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.</td>
</tr>
</table>

P332+P313: If skin irritation occurs: Get medical advice/attention.

P362: Take off contaminated clothing and wash before reuse.

Disposal:

P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: Pale to Dark Brown liquid.

IMMEDIATE CONCERNS: HAZARD DESCRIPTION / WARNING INFORMATION SUMMARY - This product is a flammable liquid which may be harmful if ingested, inhaled, comes in contact with skin or eyes, or is released into the environment. Please read entire contents of Section 2 of this Safety Data Sheet (SDS) for details.

POTENTIAL HEALTH EFFECTS

EYES: Eye contact with vapors may cause eye irritation, watering of eyes and reddening. Eye contact with liquid may cause irritation and pain. Prolonged contact may result in tissue damage.

SKIN: Skin contact may cause skin irritation and redness. Repeated or prolonged skin contact may cause dermatitis.

INGESTION: Ingestion may cause irritation to the gastrointestinal tract with nausea and diarrhea. May be harmful if swallowed in large quantities.

INHALATION: Breathing the mist and vapors may be irritating to the respiratory tract.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

CHRONIC EFFECTS: Skin, eye, and respiratory tract irritation. Gastrointestinal and vascular effects and death may occur at high concentrations. May cause nervous system effects, such as headache, nausea and drowsiness.

CARCINOGENICITY: Not Established.

MUTAGENICITY: Not Established.

REPRODUCTIVE TOXICITY

REPRODUCTIVE EFFECTS: Not Established.

TERATOGENIC EFFECTS: Not Established.

MEDICAL CONDITIONS AGGRAVATED: Benzene - Pre-existing blood system disorders, respiratory conditions, central nervous, liver, kidney, and cardio-vascular conditions may be aggravated by severe or chronic overexposure to benzene. Skin disorders may also be aggravated by exposures to benzene.

ROUTES OF ENTRY: Inhalation, skin contact, eye contact, ingestion.

TARGET ORGAN STATEMENT: May cause damage to eyes, skin and respiratory system.

CANCER STATEMENT: This product may cause cancer. Refer to Section 11 of this SDS for details.

SENSITIZATION: Not Established.

COMMENTS: ADDITIONAL MEDICAL AND TOXICOLOGICAL INFORMATION: Natural gas condensate and some of its fractions, which can contaminate produced water, have been shown to cause skin irritation, damage and even cancers when applied directly and repeatedly to skin. When laboratory animals inhale oil vapors at high concentration or ingest in repeated doses, various tumors have developed.

This product contains benzene, which can cause degeneration in blood forming bone marrow leading to anemia which may further degrade to leukemia, a type of cancer (see 29 CFR 1910.1028 of standard). Acute benzene is recognized as a human carcinogen by OSHA, NTP, ACGIH, and IARC.

3. COMPOSITION / INFORMATIO N ON INGREDIENTS

Chemical Name	Vol. %	CAS
Water	84-88	7732-18-5
Calcium Chloride	>0-1.0	10043-52-4
Potassium Chloride	>0-1.0	7447-40-7
Sodium Chloride	>0-1.0	7647-14-5
Benzene	>0-1.0	71-43-2
Toluene	>0-1.0	108-88-3
Ethyl benzene	>0-1.0	100-41-4
m-p- Xylene	>0-1.0	179601-23-1
o-Xylene	>0-1.0	95-47-6
Hexane	>0-1.0	110-54-3
Hydrogen Sulfide	>0-1.0	7783-06-4

COMMENTS: Compositions given are typical values, not specifications. Composition may vary with geographic location, geologic formation, temperature and pressure. Hydrogen sulfide composition is expressed as total sulfur content.

4. FIRST AID MEASURES

EYES: Immediately flush with large amounts of water, holding eyelids open, for at least 20 minutes. Repeat if necessary. Remove contact lenses, if present and easy to do. If pain or redness persists, seek medical attention. If eye is exposed to hot liquid, cover eyes with cloth and seek medical attention immediately.

SKIN: In case of hot liquid exposure, do not remove clothing or treat, wash only unburned area and seek medical attention immediately.

INGESTION: Do not induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Have exposed individual rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Obtain medical assistance immediately and treat as directed by a medical professional.

INHALATION: Move victim to fresh air. Call 911, emergency medical service, or Emergency Phone Numbers(s) provided in Section 1 of this SDS. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth methods if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.

ANTIDOTES: Not Established.

NOTES TO PHYSICIAN: No specific treatment. Treat symptomatically. General supportive measures with continual monitoring of gas exchange, acid-base balance, electrolytes, and fluid intake are also required. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

CLINICAL TESTING & MEDICAL MONITORING FOR DELAYED EFFECTS - Not Established.

COMMENTS: CONTRAINDICATIONS - Not Established.

5. FIRE FIGHTING MEASURES

FLASH POINT: <38°C (100°F)

FLAMMABLE LIMITS: 1 to 15

AUTOIGNITION TEMPERATURE: Not Established.

FIRE FIGHTING PROCEDURES: PROTECTIVE ACTIONS TO TAKE DURING FIRE FIGHTING - Move containers from fire area if you can do it without risk. Dike fire-control water for later disposal; do not scatter the material. Do not get water inside containers. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or

safety devices; icing may occur. Persons involved in fire fighting response involving this product and its containers/packaging should refer to Section 8 of this SDS for the proper selection of exposure controls and personal protective equipment.

FIRE FIGHTING EQUIPMENT: PRECAUTIONS FOR FIRE INVOLVING TANKS OR CAR/TRAILER LOADS - Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

COMMENTS:

SPECIFIC HAZARDS THAT MAY ARISE FROM THE PRODUCT - Vapors are flammable and heavier than air. Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger. Sudden reaction and fire may result if product is mixed with an oxidizing agent.

FIRE EXPLOSION: This product is primarily water but can have hydrocarbon gas that can be released with the potential of a fire hazard. Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Many liquids are lighter than water. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated.

SENSITIVE TO STATIC DISCHARGE: Not Established.

SENSITIVITY TO IMPACT: Not Established.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: For emergency information and procedures to follow in the case of an accidental release, call the Emergency Telephone Number(s) listed in Section 1 of this SDS. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). As an immediate precautionary measure, isolate spill or leak area 50 meters (160 feet) in all directions. Evacuate building and all affected areas. Keep unauthorized personnel away. Do not touch or walk through spilled material. Stay upwind. Keep out of low areas. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. Dike far ahead of liquid for later disposal. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material. Water spray may reduce vapor; but may not prevent ignition in closed spaces. A vapor suppressing foam may be used to reduce vapors. Provide sufficient ventilation in the affected area(s) and wear appropriate personal protective equipment as indicated in Section 8 when handling spill material.

LARGE SPILL: Use similar response procedures as indicated under Small Spill. Consider initial downwind evacuation for at least 100 meters (330 feet). Large releases may require the notification of local emergency response agencies. Wear self-contained breathing apparatus if conditions or air monitoring warrants.

7. HANDLING AND STORAGE

GENERAL PROCEDURES: Handle in accordance with good industrial hygiene and safety practices. These practices include but are not limited to avoiding unnecessary exposure and prompt removal of material from eyes, skin and clothing. Wash exposed skin and clothing frequently. If needed, take first aid actions as indicated in Section 4 of this SDS.

HANDLING: Wear appropriate personal protective equipment and use exposure controls as indicated in Section 8. Vent slowly to the atmosphere when opening. Avoid all contact with skin and eyes. Avoid breathing product dust or vapors. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Remove contaminated clothing immediately. Wash with soap and water after working with this product.

STORAGE: Keep in airtight container away from all heat sources. Store in a segregated and approved area. Store in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Keep container in a well-ventilated area. Ground all containers during transfer. Store away from incompatible materials. Cylinders should be separated from oxygen cylinders or other oxidizers by a minimum distance of 20 feet, or by a barrier of non-combustible material at least 5 feet high having a fire resistance rating of at least 1/2 hour. Store in the original container or an approved alternative made from compatible material. Do not store in unlabeled containers. Treat empty containers in a similar fashion as residual product may exist. Use appropriate containment to avoid environmental contamination.

STORAGE TEMPERATURE: Store containers of product in cool (between 50°F or below), well ventilated location.

STORAGE PRESSURE: Store in a room with ambient pressure.

ELECTROSTATIC ACCUMULATION HAZARD: Not Established.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE GUIDELINES

OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)			
		EXPOSURE LIMITS	
		OSHA PEL	ACGIH TLV
Chemical Name		ppm	ppm
Calcium Chloride	TWA	N/E	N/E
	STEL	N/E	N/E
Potassium Chloride	TWA	NE	N/E
	STEL	N/E	N/E
Sodium Chloride	TWA	N/E	N/E
	STEL	N/E	N/E
Benzene	TWA	0.1	0.5
	STEL	1	2.5
Toluene	TWA	200	20
	STEL	300	N/E
Ethyl benzene	TWA	100	20
	STEL	N/E	N/E
m-p Xylene	TWA	100	100
	STEL	N/E	150
o- Xylene	TWA	100	100
	STEL	N/E	150
Hexane	TWA	500	50
	STEL	N/E	N/E
Hydrogen Sulfide	TWA	N/E	1
	STEL	20	5

Footnotes:
1. OSHA has also assigned H_2S a STEL value of 50 ppm for a 10-minute peak that may be reached only once per 8-hour shift.
C = Ceiling

ENGINEERING CONTROLS: Provide adequate general and local ventilation to maintain airborne chemical concentrations below applicable exposure limits, to prevent accumulation of flammable vapors and formation of explosive atmospheres, and to prevent formation of oxygen deficient atmospheres, especially in confined spaces. This product may release gases or vapors that can displace oxygen in enclosed areas.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Employees should be provided with and required to use splash-proof safety goggles and full face splash shields where there is any possibility of product coming in contact with eyes. Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of contact lenses. Ensure that eye wash station is operable and nearby.

SKIN: Consider wearing long-sleeve, FRC, otherwise normal working clothes should be worn. Wash contaminated clothing prior to reuse. If gloves are required for job operations involving this product, wear nitrile rubber or polyvinylalcohol (PVAL) gloves.

RESPIRATORY: Respiratory protection is normally not required except in emergencies or when conditions cause excessive airborne levels of mists or vapors. Select NIOSH-approved organic vapor air-purifying respirator, SCBA or air-supplied respirator where there may be potential for overexposure.

PROTECTIVE CLOTHING: Long sleeve shirt and long pants or coveralls. Consider wearing butyl rubber apron or outerwear where splashing may occur. Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire.

WORK HYGIENIC PRACTICES: Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove contaminated clothing and launder before reuse. Shower after work using plenty of soap and water.

OTHER USE PRECAUTIONS: FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR DEATH CONDITIONS - A self-contained breathing apparatus with full face piece operated in a pressure-demand or other positive pressure mode is recommended for firefighting or other immediately dangerous to life and death conditions. Supplied-air respirator with full face piece and operated in pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode may also be used.

COMMENTS: EXPOSURE LIMITS & SOURCES - Refer to Section 16 Table 1 for additional exposure limits and sources for this product or its components, whichever applies.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR: Hydrocarbon.

APPEARANCE: Dark Brown to Black.

pH: 6 to 8

PERCENT VOLATILE: Negligible.

VAPOR PRESSURE: Not Established.

VAPOR DENSITY: 1.2 (Air = 1)

BOILING POINT: Varies widely depending on hydrocarbon content.

FREEZING POINT: < 0°C (32°F)

POUR POINT: Not Established.

FLASH POINT: Variable organic oil and dissolved gas maybe flammable.

SOLUBILITY IN WATER: Not Established.

EVAPORATION RATE: Not Established.

SPECIFIC GRAVITY: > 1.000 at 0°C (32°F)

VISCOSITY: Not Established.

COEFF. OIL/WATER: Not Established.

ODOR THRESHOLD: Not Established.

10. STABILITY AND REACTIVITY

STABLE: Yes

HAZARDOUS POLYMERIZATION: No

STABILITY: CHEMICAL STABILITY - This product is anticipated to be stable under normal ambient storage and handling conditions of temperature and pressure.

POLYMERIZATION: This product is not anticipated to cause hazardous reactions or polymerizations under normal ambient storage and handling conditions of temperature and pressure.

CONDITIONS TO AVOID: Avoid contact with incompatible materials such as heat, open flame, other sources of ignition, and oxidizing materials such as chlorine and concentrated nitric acid.

HAZARDOUS DECOMPOSITION PRODUCTS: This product may produce carbon monoxide and carbon dioxide during decomposition.

11. TOXICOLOGICAL INFORMATION

ACUTE

Chemical Name	ORAL LD_{50} (rat)	DERMAL LD_{50} (rabbit)	INHALATION LC_{50} (rat)
Sodium Chloride	3000 mg/kg	N/E	N/E
Calcium Chloride	1000 mg/kg	2630 mg/kg	Not Established.
Xylene	5000 mg/kg	12400 mg/kg	4550 ppm (4 hours)
Hexane	25 g/kg	Not Established.	48000 ppm (4 hours)
Crude Oil	> 5000 mg/kg	> 2000 mg/kg	Not Established.
Toluene	636 mg/kg	14100 ug/kg	49 g/m^3 (4 hours)
Benzene	930 mg/kg	> 9400 ug/kg	10000 ppm (7 hours)
Ethyl benzene	<= 3500 mg/kg	<= 3500 mg/kg	<= 55000 mg/m^3
Hydrogen Sulfide	Not Established.	Not Established.	700 mg/m3 (4 hours)

EYE EFFECTS: May cause moderate to severe eye irritation.

SKIN EFFECTS: May cause mild skin irritation. Prolonged or repeated contact may result in mild irritation. May be absorbed through skin with toxic effects.

CHRONIC: This product contains benzene, which can cause degeneration in blood forming bone marrow leading to anemia, which may further degrade to leukemia, a type of cancer. Chronic exposure affects the hematopoietic system causing blood disorders including anemia and pancytopenia.

CARCINOGENICITY

Chemical Name	NTP Status	IARC Status	OSHA Status
Crude Oil		3	
Benzene	1	1	Carcinogen.

SENSITIZATION: This product is not expected to be a skin sensitizer.

NEUROTOXICITY: Not Established. **GENETIC**

EFFECTS: Not Established. **REPRODUCTIVE**

EFFECTS: Not Established. **TERATOG ENIC**

EFFECTS: Not Established. **MUTAGENICITY:**

Not Established.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA: MOBILITY IN SOIL POTENTIAL - Not Established.

BIOACCUMULATION/ACCUMULATION: Not Established.

DISTRIBUTIO N: Do not discharge into or allow runoff to flow into sewers and natural waterways. Contain spill material and dike for proper disposal.

AQUATIC TOXICITY (ACUTE): This product is not expected to be harmful to aquatic life.

96-HOUR LC_{50}: 3930 - 5360 mg/L Pimephales promelas for calcium chloride.

48-HOUR EC_{50}: 52 mg/L for Daphnia magna for calcium chloride.

CHEMICAL FATE INFORMATION: PERSISTENCE & DEGRADABILITY - Not Established.

GENERAL COMMENTS: Any other adverse environmental effects, such as environmental fate (exposure), ozone depletion potential, photochemical ozone creation potential, endocrine disrupting potential, and global warming potential are indicated in this section if data exists. Otherwise, this data has not been established.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: This product is not a listed hazardous waste. However, when disposed of in containers it may meet the criteria of being an ignitable waste. It is the responsibility of the user to determine if the material disposed of meets federal, state, or local criteria to be defined as a hazardous waste and dispose of accordance with applicable Federal, state and local regulations.

EMPTY CONTAINER: Offer rinsed packaging material to local recycling facilities.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATIO N)

PROPER SHIPPING NAME: Flammable liquid, n.o.s.

PRIMARY HAZARD CLASS/DIVISION: 3

UN/NA NUMBER: 1993

PACKING GROUP: II

NAERG: 128

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

311/312 HAZARD CATEGORIES: Fire hazard. Immediate (acute) health hazard. Delayed (chronic) health hazard.

FIRE: Yes **PRESSURE GENERATING:** No **REACTIVITY:** No **ACUTE:** Yes **CHRONIC:** Yes

EPCRA SECTION 313 SUPPLIER NOTIFICATION

Chemical Name	Vol. %	CAS
Benzene	>0-1.0	71-43-2

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

Chemical Name	Vol. %	CERCLA RQ
Benzene	>0-1.0	10
Hydrogen Sulfide	>0-1.0	100

TSCA (TOXIC SUBSTANCE CONTROL ACT)

Chemical Name	CAS
Sodium Chloride	7647-14-5
Calcium Chloride	10043-52-4
Crude Oil	8002-05-9
Benzene	71-43-2
Hydrogen Sulfide	7783-06-4

CLEAN AIR ACT

Chemical Name	Vol. %	CAS
Hydrogen Sulfide	>0-1.0	7783-06-4

STATES WITH SPECIAL REQUIREMENTS

Chemical Name	Requirements
Crude Oil	Massachusetts Hazardous Substance Minnesota Hazardous Substance Pennsylvania Hazardous Substance
Benzene	CA Hazardous Substance Delaware Air Quality Management Illinois Toxic Air Contaminant Maine Hazardous Air Pollutant Massachusetts Hazardous Substance Michigan Critical Material Minnesota Hazardous Substance New Jersey RTK Hazardous Substance New York Hazardous Substance North Carolina Toxic Air Contaminant Pennsylvania Hazardous Substance Washington PELs for Air Contaminants West Virginia Toxic Air Pollutant Wisconsin Hazardous Air Containment
Hydrogen Sulfide	CA Hazardous Substance Delaware Air Quality Management Idaho Air Pollutant Massachusetts Hazardous Substance Maine Hazardous Air Pollutant Minnesota Hazardous Substance New Jersey RTK Hazardous Substance New Jersey TCPA EHS New York Hazardous Substance North Carolina Toxic Air Contaminant Pennsylvania Hazardous Substance Washington PELs for Air Contaminants Wisconsin Hazardous Air Containment

CALIFORNIA PROPOSITION 65

Chemical Name	Vol. %	Listed
Benzene	< 1	Developmental Toxicity Male Reproductive

16. OTHER INFORMATIO N

RELEVANT R-PHRASES:R36/37/38: Irritating to eyes, respiratory system and skin.
R45: May cause cancer.
R46: May cause heritable genetic damage.
R11: Highly flammable.
R36/38: Irritating to eyes and skin.
R65: Harmful: may cause lung damage if swallowed.
R12: Extremely flammable.
R26: Very toxic by inhalation.
R50: Very toxic to aquatic organisms.

PREPARED BY: SLR International Corporation

REVISION SUMMARY:

NATIONAL FIRE PROTECTION ASSOCIATION®HAZARD RATING

HEALTH:	2-Hazardous
FIRE:	3-Below 100°F (flashpoint)
REACTIVITY:	0- Stable

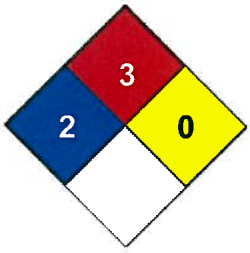
HAZARDOUS MATERIAL IDENTIFICATION SYSTEM®HAZARD RATING

HEALTH:	2*- Moderate Hazard (*Chronic)
FIRE:	3- Serious Hazard
PHYSICAL:	0- Minimal Hazard

HMIS RATING

HEALTH *	2
FLAMMABILITY	3
PHYSICAL HAZARD	0
PERSONAL PROTECTION	G

NFPA CODES



DATA SOURCES:

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UNECE. Globally Harmonized System of Classification and labeling of Chemicals (GHS). Third Revised Edition. New York and Geneva. United Nations, 2009.
US DOT; Pipeline and Hazardous Materials Safety Administration. 2008 Emergency Response Guidebook. Neenah, WI. J.J. Keller & Associates, Inc. 2008.
US EPA. Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-To-Know Act (EPCRA) and Section 112(r) of the Clean Air Act. [Available] Online: http://www.epa.gov/ceppo/pubs/title3.pdf. Retrieved 02/02/2011.

ADDITIONAL MSDS INFORMATION:

KEY / LEGEND

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous Goods by Road
CAA - Clean Air Act
CAS - Chemical Abstracts Service Registry Number
CDG - Carriage of Dangerous Goods By Road and Rail Manual
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
CFR - Code of Federal Regulations
EINECS - European Inventory of Existing Chemical Substances Registry Number

ERG - Emergency Response Guidebook
EPCRA - Emergency Planning and Community Right-to-Know Act
GHS - Globally Harmonized System of Classification and Labeling of Chemicals
IARC - International Agency for Research on Cancer
IATA - International Air Transport Association
ICAO - International Civil Aviation Organization
IMDG - International Maritime Dangerous Goods Code
IMO - International Maritime Organization
N/E - Not Established
NTP - National Toxicology Program
OSHA - Occupational Safety and Health Administration
PEL - Permissible Exposure Limit
PPE - Personal Protective Equipment
RCRA - Resource Conversation and Recovery Act
RID - Regulations Concerning the International Transport of Dangerous Goods by Rail
RQ - Reportable Quantities
SARA - Superfund Amendments and Reauthorization Act of 1986
SDS - Safety Data Sheet
TCC - Tag Closed Cup
TDG - Transportation of Dangerous Goods
TLV - Threshold Limit Value
TSCA - Toxic Substance Control Act
UN/NA - United Nations / North American Number
UNECE - United Nations Economic Commission for Europe
US DOT - United States Department of Transportation
US EPA - United States Environmental Protection Agency
Vol. - Volume
WHMIS - Workplace Hazardous Materials Information System

GENERAL STATEMENTS: Other information not included anywhere else in this SDS is included in this section if, in fact, such data exists.

MANUFACTURER DISCLAIMER: This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. NO WARRANTY OF MERCANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION HEREIN PROVIDED. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

SAFETY DATA SHEET

Date Issued : 10/26/2012
SDS No : CA201-006
Date Revised : 12/20/2012
Revision No : 1

Sweet Natural Gas

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Sweet Natural Gas
CHEMICAL FAMILY: Hydrocarbon Mixture; Aliphatic Hydrocarbon
ALTERNATE TRADE NAME(S): Well Head Gas, Casing Head Gas

24 HR. EMERGENCY TELEPHONE NUMBERS

(281) 589-4600

2. HAZARDS IDENTIFICATION

GHS CLASSIFICATIONS

Health	Physical
Carcinogenicity, Category 1 Hazard Not Otherwise Classified, Simple Asphyxiant	Gases Under Pressure, Liquefied gas Flammable Gases, Category 1

GHS LABEL

<table>
<tr><td></td><td rowspan="2">  Flame</td></tr>
<tr><td>WARNING
H000: May displace oxygen and cause rapid suffocation.</td></tr>
<tr><td></td><td>DANGER
H220: Extremely flammable gas.</td></tr>
<tr><td>  Gas cylinder</td><td>  Health hazard</td></tr>
<tr><td>WARNING
H280: Contains gas under pressure; may explode if heated.</td><td>DANGER
H350: May cause cancer.</td></tr>
</table>

PRECAUTIONARY STATEMENT(S)

Prevention:

P210: Keep away from heat/sparks/open flames/hot surfaces – no smoking.
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P281: Use personal protective equipment as required.

Response:

P377: Leaking gas fire: Do not extinguish unless leak can be stopped safely.
P381: Eliminate all ignition sources if safe to do so.
P308+P313: IF exposed or concerned: Get medical advice/attention.

Storage:

P403: Store in a well-ventilated place.
P410+P403: Protect from sunlight. Store in a well-ventilated place.

Disposal:

P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

EMERGENCY OVERVIEW

IMMEDIATE CONCERNS: HAZARD DESCRIPTION / WARNING INFORMATION SUMMARY - This material is a flammable gas. This product is toxic; inhalation of this material may cause severe injury or death. Please read entire contents of Section 2 of this Safety Data Sheet (SDS) for details.

POTENTIAL HEALTH EFFECTS

EYES: This product is unlikely to cause eye irritation.

SKIN: This product is unlikely to cause skin irritation or injury.

INGESTION: This product is a compressed gas; hence oral exposure and resulting acute toxicity are unlikely.

INHALATION: This product is a simple asphyxiant. Excessive exposure may cause central nervous system effects such as dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure and death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

CARCINOGENICITY: No component of this product present at levels greater than or equal to 0.1% is identified as a probable, possible, or confirmed carcinogen by IARC, NTP, OSHA or ACGIH.

MUTAGENICITY: Not Established.

REPRODUCTIVE TOXICITY

REPRODUCTIVE EFFECTS: Not Established.

TERATOGENIC EFFECTS: Not Established.

MEDICAL CONDITIONS AGGRAVATED: Persons with pre-existing central nervous system disorders should refrain from contact with this material.

ROUTES OF ENTRY: Inhalation, skin contact, eye contact.

TARGET ORGAN STATEMENT: May cause damage to lungs and central nervous system.

SENSITIZATION: Not Established.

COMMENTS: OTHER HAZARDS - Not Established.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Vol. %	CAS	EINECS	Classification
Methane	70 - 94	74-82-8	200-812-7	T+,N; R61, R26, R48/23, R50/53
Ethane	5 - 10	74-84-0	200-814-8	F+; R12
Propane	1 - 4	74-98-6	200-827-9	F+; R12
i-Butane	0.5 - 3	75-28-5	200-857-2	F+; R12
n-Butane	0.5 - 2	106-97-8	203-448-7	F+; R12
Carbon Dioxide	0.5 - 10	124-38-9	204-696-9	
Nitrogen	0.5 - 10	7727-37-9	231-783-9	
Benzene	may contain	71-43-2	200-753-7	F, T; R45, R46, R11, R36/38, R48/23/24/25, R65
Hydrogen Sulfide	may contain	7783-06-4	231-977-3	F+, T+, N; R12, R26, R50

COMMENTS: This may not be a complete list of components. Compositions given are typical values, not specifications.

(Full text of R-Phrases can be found under heading 16)

4. FIRST AID MEASURES

EYES: Immediately flush eyes with plenty of water. Get medical attention, if irritation persists.

SKIN: Wash with soap and water. Get medical attention if irritation develops or persists.

INGESTION: This is not considered a major potential route of exposure.

INHALATION: Move victim to fresh air. Call 911, emergency medical service, or Emergency Phone Numbers(s) provided in Section 1 of this SDS. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper resipratory medical device. Administer oxygen if breathing is difficult.

ANTIDOTES: Not Established.

NOTES TO PHYSICIAN: CLINICAL TESTING & MEDICAL MONITORING FOR DELAYED EFFECTS - Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed. Provide general supportive measures and treat symptomatically.

5. FIRE FIGHTING MEASURES

FLASH POINT: -188°C (-306.4°F)

Notes: Based on methane.

FLAMMABLE LIMITS: 1.0 to 15.0

Notes: Flammable Limits given as percentage volume in air at normal atmospheric temperature and pressure.

AUTOIGNITION TEMPERATURE: 482°C (900°F) to 649°C (1200°F)

GENERAL HAZARD: DECOMPOSITION TEMPERATURE - Not Established.

EXTINGUISHING MEDIA:

SMALL FIRE - Class B fire extinguisher, carbon dioxide, multipurpose dry chemical, water fog or alcohol-resistant foam.
LARGE FIRE - Water fog or alcohol-resistant foam.

HAZARDOUS COMBUSTION PRODUCTS: Any combustion, including incomplete combustion, may form carbon monoxide and carbon dioxide. Burning produces noxious and toxic fumes. Downwind personnel must be evacuated.

OTHER CONSIDERATIONS: INAPPROPRIATE EXTINGUISHING MEDIA - Do not use water jet.

FIRE FIGHTING PROCEDURES:

PROTECTIVE ACTIONS TO TAKE DURING FIRE FIGHTING - DO NOT extinguish a leaking gas flame unless the leak can be stopped. In many cases it will be preferable to allow continued burning. Move containers from fire area if you can do it without risk. Dike fire-control water for later disposal; do not scatter the material. Do not get water inside containers. Use water spray or fog; do not use straight streams. Note: Use of water spray when fighitng fire may be inefficient or cause a chemical reaction. Persons involved in fire fighting response involving this product and its containers/packaging should refer to Section 8 of this SDS for the proper selection of exposure controls and personal protective equipment.

FIRE FIGHTING EQUIPMENT: PRECAUTIONS FOR FIRE INVOLVING TANKS OR CAR/TRAILER LOADS - Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. Isolate for 1600 meters (1 mile) in all directions; also consider initial evacuation for 1600 meters (1 mile) in all directions. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

FIRE EXPLOSION: HIGHLY FLAMMABLE. Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated.

COMMENTS:

SPECIFIC HAZARDS THAT MAY ARISE FROM THE PRODUCT - Vapors are flammable and heavier than air. Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: For emergency information and procedures to follow in the case of an accidental release, call the Emergency Telephone Number(s) listed in Section 1 of this SDS. Remove any ignition sources and protect from ignition. Water spray may reduce vapor but may not prevent ignition in closed spaces. A vapor suppressing foam may be used to reduce vapors. Provide sufficient ventilation in the affected area(s) and wear appropriate personal protective equipment as indicated in Section 8 of this

SDS when handling spill material. Isolate the area until gas has dispersed. Never discharge releases directly into sewers or surface waters.

LARGE SPILL: Use similar response procedures as indicated under Small Spill.

GENERAL PROCEDURES: MATERIALS & METHODS (EQUIPMENT & TECHNIQUES) FOR CONTAINMENT & CLEANUP - Call Emergency Telephone Number(s) provided in Section 1 of this SDS. As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering.

RELEASE NOTES: ENVIRONMENTAL PRECAUTIONS - Prevent entry into waterways, sewers, basements or confined areas. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Avoid allowing water runoff to contact spilled material.

SPECIAL PROTECTIVE EQUIPMENT: EMERGENCY & NON-EMERGENCY RESPONDERS - Refer to Section 8 of this SDS for appropriate exposure controls and personal protective equipment (PPE).

7. HANDLING AND STORAGE

GENERAL PROCEDURES: Handle in accordance with good industrial hygiene and safety practices. These practices include but are not limited to avoiding unnecessary exposure and prompt removal of material from eyes, skin and clothing. If needed, take first aid actions as indicated in Section 4 of this SDS.

HANDLING: Use only with adequate ventilation. Wear appropriate personal protective equipment and use exposure controls as indicated in Section 8 of this SDS. Vent slowly to the atmosphere when opening. Avoid all contact with skin and eyes. Avoid breathing product dust or vapors. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not reuse container. Remove contaminated clothing immediately. Wash with soap and water after working with this product.

STORAGE: Keep in airtight container away from all heat sources. Store in a segregated and approved area. Store in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Keep container in a well-ventilated area. Ground all containers during transfer. Store away from incompatible materials. Cylinders should be separated from oxygen cylinders or other oxidizers by a minimum distance of 20 feet, or by a barrier of non-combustible material at least 5 feet high having a fire resistance rating of at least 1/2 hour. Store in the orginal container or an approved alternative made from compatible material. Do not store in unlabeled containers. Treat empty containers in a similar fashion as residual product may exist. Use appropriate containment to avoid environmental contamination.

STORAGE TEMPERATURE: Store containers in a room with ambient temperature.

STORAGE PRESSURE: Containers should be stored in room with ambient pressure.

SHELF LIFE:

HOW TO MAINTAIN THE INTEGRITY OF THE SUBSTANCE BY USE OF STABILIZERS OR ANTIOXIDANTS - Not Established.

ELECTROSTATIC ACCUMULATION HAZARD: To minimize the hazard of static electricity during transfer operations, bonding and grounding may be neccessary, but may not by themselves be sufficient. For more information, refer to OSHA Standard 29 CFR 1910.106; National Fire Protection Standard (NFPA) 77 - "Recommended Practice on Static Electricity"; and/or the American Petroleum Institute (API) Recommended Practice 2003 - "Protection Against Ignitions Arising Out of Static, Lighting and Stray Currents."

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE GUIDELINES

OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)					
		EXPOSURE LIMITS			
		OSHA PEL		ACGIH TLV	
Chemical Name		**ppm**	**mg/m³**	**ppm**	**mg/m³**
Ethane	**TWA**	N/E	N/E	1000	N/E
	STEL	N/E	N/E	N/E	N/E
Propane	**TWA**	1000	1800	1000	N/E
	STEL	N/E	N/E	N/E	N/E
i-Butane	**TWA**	N/E	N/E	1000	N/E
	STEL	N/E	N/E	N/E	N/E
n-Butane	**TWA**	N/E	N/E	1000	N/E
	STEL	N/E	N/E	N/E	N/E
Carbon Dioxide	**TWA**	5000	9000	5000	9000
	STEL	N/E	N/E	30000	54000

ENGINEERING CONTROLS: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Employees should be provided with and required to use splash-proof safety goggles and splash shields where there is any possibility of product coming in contact with eyes. Ensure that eye wash station is operable and nearby.

SKIN: GLOVES AND BOOTS - Any impervious gloves and boots including butyl rubber, nitrile rubber or neoprene rubber.

RESPIRATORY: Depending on airborne concentration a full-face supplied air respirator is recommended, because air purifying respirators can not provide adequate protection.

PROTECTIVE CLOTHING: Depending on the conditions of use, protective gloves, apron, boots, head and face protection should be worn. Cotton clothing is recommended.

WORK HYGIENIC PRACTICES: Consider the potential hazards of this material, applicable exposure limits, job activities, environmental working conditions, and other substances in the workplace when designing engineering controls and selecting personal protective equipment (PPE). The user should read and understand all manufacturer instructions and limitations supplied with the personal protection equipment before use.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR: Generally odorless (if no H_2S is present and no no mercaptan added for odor).

APPEARANCE: Colorless gas.

pH: Not Applicable.

PERCENT VOLATILE: 100

VAPOR PRESSURE: Not Established.

VAPOR DENSITY: 0.6 to 0.8 (Air = 1)

BOILING POINT: -161 °C (-258 °F)

Notes: Based on methane.

FREEZING POINT: Not Applicable.

MELTING POINT: Not Applicable.

FLASH POINT: -188 °C (-306.4 °F)

Notes: Based on methane.

EVAPORATION RATE: Not Established.

DENSITY: Not Established.

SPECIFIC GRAVITY: Not Established.

VISCOSITY: Not Applicable.

COEFF. OIL/WATER: Not Established.

ODOR THRESHOLD: Not Established.

COMMENTS: FLAMMABILITY - Refer to Section 2 and Section 5 of this SDS for classification and flammability characteristics.

10. STABILITY AND REACTIVITY

STABLE: Yes

HAZARDOUS POLYMERIZATION: No

STABILITY: This product is anticipated to be stable under normal ambient storage and handling conditions of temperature and pressure.

POLYMERIZATION: This product is not anticipated to cause hazardous reactions or polymerizations under normal ambient storage and handling conditions of temperature and pressure.

CONDITIONS TO AVOID: Avoid contact with incompatible materials. Avoid exposure to excess heat, sparks, open flame, or other potential ignition sources. Prevent vapor accumulation.

HAZARDOUS DECOMPOSITION PRODUCTS: Products of thermal decomposition include carbon oxides and nitrogen oxides.

INCOMPATIBLE MATERIALS: Strong oxidizing agents, liquid oxygen, mineral acids and metal catalysts.

11. TOXICOLOGICAL INFORMATION

ACUTE

Chemical Name	**ORAL LD_{50} (rat)**	**DERMAL LD_{50} (rabbit)**	**INHALATION LC_{50} (rat)**
Ethane	Not Established.	Not Established.	> 800000 ppm (15 min)
Propane	Not Established.	Not Established.	658 mg/L (4 hours)
i-Butane	Not Established.	Not Established.	658 mg/L (4 hours)
n-Butane	Not Established.	Not Established.	658 g/m^3
Carbon Dioxide	Not Established.	Not Established.	30000 to 50000 ppm (30 min)
Benzene	930 mg/kg	> 9400 ug/kg	10000 ppm (7 hours)
Hydrogen Sulfide	Not Established.	Not Established.	444 ppm

NOTES: ACUTE TOXICITY & HEALTH EFFECTS - This product is a simple asphyxiant; higher concentrations may cause dizziness. Refer to Section 2 of this SDS for additional hazards identification.

EYE EFFECTS: Not expected to cause prolonged or significant eye irritation.

SKIN EFFECTS: Not expected to cause prolonged or significant skin irritation.

CHRONIC: TOXICITY & HEALTH EFFECTS - This product is not expected to be toxic. Refer to Section 2 of this SDS for additional hazards identification.

CARCINOGENICITY

Chemical Name	NTP Status	IARC Status	OSHA Status
Benzene	1	1	Carcinogen.

Notes: No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH, the International Agency for Research on Cancer (ARC), the U.S. National Toxicology Program (NTP) or the U.S. Occupational Safety and Health Act (OSHA).

SENSITIZATION: Not Established.

NEUROTOXICITY: Not Established.

GENETIC EFFECTS: Not Established.

REPRODUCTIVE EFFECTS: Not Established.

TARGET ORGANS: Contact may cause damage to the lungs and central nervous system.

TERATOGENIC EFFECTS: Not Established.

MUTAGENICITY: Not Established.

SYNERGISTIC MATERIALS: Not Established.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA: MOBILITY IN SOIL POTENTIAL - Not Established.

ECOTOXICOLOGICAL INFORMATION: TERRESTRIAL/MICROORGANISM TOXICITY -

ACUTE: Ecological data does not exist for this mixture.

CHRONIC: Ecological data does not exist for this mixture.

BIOACCUMULATION/ACCUMULATION: Ecological data does not exist for this mixture.

AQUATIC TOXICITY (ACUTE): Ecological data does not exist for this mixture.

Notes: (CHRONIC) - Ecological data does not exist for this mixture.

CHEMICAL FATE INFORMATION: PERSISTENCE & DEGRADABILITY - Not Established.

GENERAL COMMENTS: Any other adverse environmental effects, such as environmental fate (exposure), ozone depletion potential, photochemical ozone creation potential, endocrine disrupting potential, and global warming potential are indicated in this section if data exists. Otherwise, this data has not been established.

COMMENTS: Data from laboratory studies and from scientific literature is noted in this section if available. Otherwise, data has not been established.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: It is recommended that this product, in any form, be incinerated in a suitable combustion chamber for disposal. Empty containers should be disposed of in a similar fashion due to presence of product residue. Follow applicable Federal, state, and local regulations.

PRODUCT DISPOSAL: Persons conducting disposal of this product and its containers/packaging should refer to Section 8 of this SDS for the proper selection of exposure controls and personal protective equipment.

EMPTY CONTAINER: Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static eclectricity, or other sources of ignition. They may explode and cause injury or death.

GENERAL COMMENTS: PHYSICAL & CHEMICAL PROPERTIES THAT MAY AFFECT DISPOSAL OPTIONS - Not Established.

COMMENTS: Dispose of material in accordance with national, state, regional, and local regulations. Never discharge directly into sewers or surface waters. Consult with environmental regulatory agencies for guidance on acceptable disposal practices for the product, in any form, and its containers/packaging.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: Compressed gas, flammable, n.o.s.

PRIMARY HAZARD CLASS/DIVISION: 2.1

UN/NA NUMBER: 1954

NAERG: 115

LABEL: 2.1: Flammable Gas

MARINE POLLUTANT #1: Not Listed.

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

311/312 HAZARD CATEGORIES: Fire Hazard. Immediate (Acute) Health Hazard.

FIRE: Yes **PRESSURE GENERATING:** No **REACTIVITY:** No **ACUTE:** Yes **CHRONIC:** Yes

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

Chemical Name	Wt.%	CERCLA RQ
Benzene	may contain	10
Hydrogen Sulfide	may contain	100

TSCA (TOXIC SUBSTANCE CONTROL ACT)

Chemical Name	CAS
Methane	74-82-8
Ethane	74-84-0
Propane	74-98-6
i-Butane	75-28-5
n-Butane	106-97-8
Carbon Dioxide	124-38-9
Nitrogen	7727-37-9

CLEAN AIR ACT

Chemical Name	Vol. %	CAS
Ethane	5 - 10	74-84-0
Propane	1 - 4	74-98-6
i-Butane	0.5 - 3	75-28-5
n-Butane	0.5 - 2	106-97-8

STATES WITH SPECIAL REQUIREMENTS

Chemical Name	Requirements
Ethane	Delaware Air Quality Management Massachusetts Hazardous Substance Minnesota Hazardous Substance New Jersey RTK Hazardous Substance New Jersey TCPA EHS Pennsylvania Hazardous Substance Washington PELs for Air Contaminants
Propane	Delaware Air Quality Management Massachusetts Hazardous Substance Minnesota Hazardous Substance New Jersey RTK Hazardous Substance Pennsylvania Hazardous Substance Washington PELs for Air Contaminants
	CA Hazardous Substance Delaware Air Quality Management Massachusetts Hazardous Substance

n-Butane	Minnesota Hazardous Substance New Jersey RTK Hazardous Substance Pennsylvania Hazardous Substance Pennsylvania Hazardous Substance Washington PELs for Air Contaminants
Carbon Dioxide	CA Hazardous Substance Maine Hazardous Air Pollutant Massachusetts Hazardous Substance Minnesota Hazardous Substance Pennsylvania Hazardous Substance Washington PELs for Air Contaminants
Benzene	CA Hazardous Substance Delaware Air Quality Management Illinois Toxic Air Contaminant Maine Hazardous Air Pollutant Massachusetts Hazardous Substance Michigan Critical Material Minnesota Hazardous Substance New Jersey RTK Hazardous Substance New York Hazardous Substance North Carolina Toxic Air Contaminant Pennsylvania Hazardous Substance Washington PELs for Air Contaminants West Virginia Toxic Air Pollutant Wisconsin Hazardous Air Containment
Hydrogen Sulfide	CA Hazardous Substance Delaware Air Quality Management Idaho Air Pollutant Massachusetts Hazardous Substance Maine Hazardous Air Pollutant Minnesota Hazardous Substance New Jersey RTK Hazardous Substance New Jersey TCPA EHS New York Hazardous Substance North Carolina Toxic Air Contaminant Pennsylvania Hazardous Substance Washington PELs for Air Contaminants Wisconsin Hazardous Air Containment

16. OTHER INFORMATION

RELEVANT R-PHRASES:R61: May cause harm to the unborn child.
R26: Very toxic by inhalation.
R48/23: Toxic : danger of serious damage to health by prolonged exposure through inhalation.
R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R12: Extremely flammable.
R45: May cause cancer.
R46: May cause heritable genetic damage.
R11: Highly flammable.
R36/38: Irritating to eyes and skin.
R65: Harmful: may cause lung damage if swallowed.

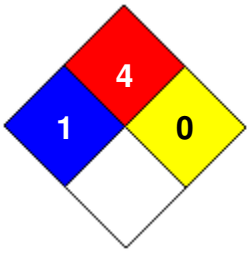
PREPARED BY: Total Safety d/b/a EHS Services

REVISION SUMMARY: This MSDS replaces the 10/26/2012 MSDS.

HMIS RATING

HEALTH	1
FLAMMABILITY	4
PHYSICAL HAZARD	0
PERSONAL PROTECTION	H

NFPA CODES



HMIS RATINGS NOTES: Please refer to Section 8 of this SDS for recommended personal protective equipment.

DATA SOURCES:

REFERENCES

ACGIH. 2012 Guide to Occupational Exposure Values. Cincinnati, OH. Signature Publications, 2012.
Forsberg, K.; Mansdorf, S.Z. Quick Selection Guide to Chemical Protective Clothing. Fifth Edition. Hoboken, NJ. John Wiley & Sons, 2007.
Lide, D.R. CRC Handbook of Chemistry and Physics. 88th Edition. Boca Raton, FL. CRC Press, 2008.
UNECE. Globally Harmonized System of Classification and labelling of Chemicals (GHS). Third Revised Edition. New York and Geneva. United Nations, 2009.
US DOT; Pipeline and Hazardous Materials Safety Administration. 2008 Emergency Response Guidebook. Neenah, WI. J.J. Keller & Associates, Inc. 2008.
US EPA. Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-To-Know Act (EPCRA) and Section 112(r) of the Clean Air Act. [Available] Online: http://www.epa.gov/ceppo/pubs/title3.pdf. Retrieved 02/02/2011.

ADDITIONAL MSDS INFORMATION:

KEY / LEGEND

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous Goods by Road
CAA - Clean Air Act
CAS - Chemical Abstracts Service Registry Number
CDG - Carriage of Dangerous Goods By Road and Rail Manual
CERCLA - Comprehensive Environmental Response, Conmensation, and Liability Act
CFR - Code of Federal Regulations
EINECS - European Inventory of Existing Chemical Substances Registry Number
ERG - Emergency Response Guidebook
EPCRA - Emergency Planning and Community Right-to-Know Act
GHS - Globally Harmonized System of Classification and Labelling of Chemicals
IARC - International Agency for Research on Cancer
IATA - International Air Transport Association
ICAO - International Civil Aviation Organization
IMDG - International Maritime Dangerous Goods Code
IMO - International Maritime Organization
N/E - Not Established
NTP - National Toxicology Program
OSHA - Occupational Safety and Health Administration
PEL - Permissible Exposure Limit
PPE - Personal Protective Equipment
RCRA - Resource Conversation and Recovery Act
RID - Regulations Concerning the International Transport of Dangerous Goods by Rail
RQ - Reportable Quantities
SARA - Superfund Amendments and Reauthorization Act of 1986
SDS - Safety Data Sheet
TCC - Tag Closed Cup
TDG - Transportation of Dangerous Goods
TLV - Threshold Limit Value
TSCA - Toxic Substance Control Act
UN/NA - United Nations / North American Number
UNECE - United Nations Economic Commission for Europe

US DOT - United States Department of Transportation
US EPA - United States Environmental Protection Agency
Vol. - Volume
WHMIS - Workplace Hazardous Materials Information System

GENERAL STATEMENTS: Other information not included anywhere else in this SDS is included in this section if, in fact, such data exists.

MANUFACTURER DISCLAIMER: This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. NO WARRANTY OF MERCANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION HEREIN PROVIDED. It is the user's responsibility to satisfy himself as to the suitabliity and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

ATTACHMENT I

EMISSION UNITS TABLE

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
#1	001-02	Reciprocating Engine; CAT 398-SI; 4SRB	1985	412 hp	Grandfathered	None
#2	001-03	Reciprocating Engine; CAT 398-SI; 4SRB	1985	412 hp	Grandfathered	None
RBV-1	001-04A	Dehydration Unit Reboiler; FLAMECO; Model # SB20-12	2011	0.75 mmBtu/hr	Existing	None
RSV-1	001-04B	Dehydration Unit Still Column; Sivalls; Model # UK	2011	12 mmscf/d	Modification	1C
#3	001-05	Reciprocating Engine; Cooper Bessemer GMX-A6; 2SLB	1975	375 hp	Grandfathered	None
#4	001-005	Reciprocating Engine; AJAX DPC 120; 2SLB	2013	115 bhp	Modification	None
T01	T01	Engine Oil Storage Tank	NA	3,000 gallons	Removal	NA
T02	T02	Used Oil Storage Tank	NA	2,150 gallons	Existing	NA
T03	T03	Pipeline Fluids AST	2011	2,100 gallons	Existing	NA
T04	T04	Glycol (TEG) Storage Tank	NA	300 gallons	Removal	NA
1C	001-04B	JATCO No. 5-96 BTEX Eliminator	2011	Control Efficiency - 98% (VOCs & HAPs)	Existing	--
T05	T05	Pipeline Liquids AST	2013	1,050 gallons	New	NA
T06	T06	Pipeline Liquids AST	2013	1,050 gallons	New	NA
TL-1	TL-1	Pipeline Liquids - Truck Loading	1983	229,950 gal/yr	New	NA
CE-BD	Blowdowns	Compressor Engine Blowdown Venting Emissions	1983	NA	New	NA

Equipment Leaks	Fugitives	Equipment Leaks	1983	NA	Existing	NA

[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] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

ATTACHMENT J

EMISSION POINTS DATA SUMMARY SHEET(S)

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
001-04A	Vertical Stack	RBV-1	Dehydration Unit Reboiler; FLAMECO; Model # SB20-12	NA	NA	NA	NA	NO_X CO VOC SO_2 PM_{10} Total HAPs CO2e	0.07 0.06 <0.01 <0.01 0.01 <0.01 87.76	0.33 0.28 0.02 <0.01 0.02 0.01 384.38	--	--	Gas/ Vapor	EE	Can Supply Upon Request
001-04B	Vertical Stack	RSV-1	Dehydration Unit Still Column; Sivalls; Model # UK	NA	NA	NA	NA	VOC Benzene Toluene Ethylbenzene Xylene n-Hexane Total HAPs	0.30 0.03 0.02 <0.01 0.02 0.02 0.08	1.29 0.11 0.08 0.01 0.01 0.07 0.37	--	--	Gas/ Vapor	EE	Can Supply Upon Request
001-005	Vertical Stack	#4	Reciprocating Engine; AJAX DPC 120; 2SLB	NA	NA	NA	NA	NO_X CO VOC SO_2 PM_{10} CH_2O Total HAPs CO2e	1.40 0.43 0.26 <0.01 0.05 0.08 0.10 121.11	6.11 1.89 1.11 0.01 0.22 0.34 0.44 530.44	--	--	Gas/ Vapor	EE	Can Supply Upon Request
T03	Relief Vent	T03	Pipeline Fluids AST	NA	NA	NA	NA	VOC	0.07	0.32	--	--	Gas/ Vapor	EE	Can Supply Upon Request
T04	Relief Vent	T04	Pipeline Fluids AST	NA	NA	NA	NA	VOC	0.07	0.32	--	--	Gas/ Vapor	EE	Can Supply Upon Request
T05	Relief Vent	T05	Pipeline Fluids AST	NA	NA	NA	NA	VOC	0.07	0.32	--	--	Gas/ Vapor	EE	Can Supply Upon Request
TL-1	Relief Vent	TL-1	Truck Loading	NA	NA	NA	NA	VOC	0.10	0.42	--	--	Gas/ Vapor	EE	Can Supply Upon Request

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

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

ATTACHMENT K

FUGITIVE EMISSIONS DATA SUMMARY SHEET(S)

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☐ Yes ☒ No ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☒ Yes ☐ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No ☐ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads		--	--	--	--	EE
Unpaved Haul Roads		--	--	--	--	EE
Storage Pile Emissions		--	--	--	--	EE
Loading/Unloading Operations	VOC	0.10	0.42	--	--	EE
Wastewater Treatment Evaporation & Operations		--	--	--	--	EE
Equipment Leaks	VOC CO_2e	0.07 1.60	0.32 7.00	--	--	EE
General Clean-up VOC Emissions		--	--	--	--	EE
Other		--	--	--	--	EE

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

ATTACHMENT L

EMISSION UNIT DATA SHEET(S)

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

ATTACHMENT L – 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: Sivalls	Model: UK
Max. Dry Gas Flow Rate: 12.00 mmscf/day	Reboiler Design Heat Input: 0.75 MMBTU/hr
Design Type: ☒ TEG ☐ DEG ☐ EG	Source Status[1]: ES / MS
Date Installed/Modified/Removed[2]: 1977 / 2011	Regenerator Still Vent APCD/ERD[3]: CD
Control Device/ERD ID#[3]: 1C	Fuel HV (BTU/scf): 1,020
H_2S Content (gr/100 scf): 0.25	Operation (hours/year): 8,760
Pump Rate (scfm): 5.00 gpm TEG	
Water Content (wt %) in: Wet Gas: Saturated	Dry Gas: 7.0 lbs H2O / 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

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

Recycling the glycol dehydration unit back to the flame zone of the reboiler.
☒ Yes ☐ No
If yes:
Is the reboiler configured to accept flash drum vapors (straight from the glycol dehydrator)? ☐ Yes ☒ No
Is the reboiler configured to accept still vent vapors (after a condenser)? ☒ Yes ☐ No
Is the reboiler configured to accept both in the same operation? ☐ 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 (%)
VOCs & HAPs	98%

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)
RBV-1/ 001-04A	Reboiler Vent	AP	NO_x	0.07	0.33
		AP	CO	0.06	0.28
		AP	VOC	<0.01	0.02

		AP	SO_2	<0.01	<0.01
		AP	PM_{10}	0.01	0.02
		AP	GHG (CO_2e)	87.76	384.38
RSV-1/ 001-004B	Glycol Regenerator Still Vent	GRI-GlyCalc™	VOC	0.29	1.25
		GRI-GlyCalc™	Benzene	0.03	0.11
		GRI-GlyCalc™	Toluene	0.02	0.08
		GRI-GlyCalc™	Ethylbenzene	<0.01	0.01
		GRI-GlyCalc™	Xylenes	0.02	0.01
		GRI-GlyCalc™	n-Hexane	0.02	0.07
FLT-1	Glycol Flash Tank	GRI-GlyCalc™	VOC	0.01	0.04
		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

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 compressor station incorporates multiple glycol dehydration units, a Glycol Dehydration Emission Unit Data Sheet all 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.

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Staten Run Compressor Station
File Name: N:\West Virginia\Nytis\Projects\Glasgow Sissonville\Air Permitting\Staten Run\GlyCalc Staten Run R13 PTE_Apr2018.ddf
Date: April 05, 2018

DESCRIPTION:

Description: Wet Gas Sample taken (2/21/2017)
Annual Emissions based on rolling totals
(11/16 - 10/17)
Max PTE for R13 Application

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 71.83 deg. F
Pressure: 74.08 psig
Wet Gas Water Content: Subsaturated
Specified Wet Gas Water Content: 64.17 lbs. H2O/MMSCF

Component	Conc. (vol %)
Carbon Dioxide	0.0580
Nitrogen	0.3420
Methane	88.3930
Ethane	7.0520
Propane	2.2350
Isobutane	0.3700
n-Butane	0.6260
Isopentane	0.2360
n-Pentane	0.1810
Cyclopentane	0.0001
n-Hexane	0.0830
Cyclohexane	0.0170
Other Hexanes	0.1560
Heptanes	0.1240
Methylcyclohexane	0.0310
2,2,4-Trimethylpentane	0.0001
Benzene	0.0030
Toluene	0.0040
Ethylbenzene	0.0001
Xylenes	0.0020
C8+ Heavies	0.0870

DRY GAS:

Flow Rate: 12.0 MMSCF/day
Water Content: 21.5 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 5.0 gpm

PUMP:

Glycol Pump Type: Electric/Pneumatic

FLASH TANK:

Flash Control: Combustion device
Flash Control Efficiency: 50.00 %
Temperature: 100.0 deg. F
Pressure: 70.0 psig

STRIPPING GAS:

Source of Gas: Dry Gas
Gas Flow Rate: 5.000 scfm

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device: Condenser
Temperature: 78.0 deg. F
Pressure: 14.7 psia

Control Device: Combustion Device
Destruction Efficiency: 95.0 %
Excess Oxygen: 5.0 %
Ambient Air Temperature: 55.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Staten Run Compressor Station
File Name: N:\West Virginia\Nytis\Projects\Glasgow Sissonville\Air Permitting\Staten Run\GlyCalc Staten Run R13 PTE_Apr2018.ddf
Date: April 05, 2018

DESCRIPTION:

Description: Wet Gas Sample taken (2/21/2017)
Annual Emissions based on rolling totals
(11/16 - 10/17)
Max PTE for R13 Application

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.5993	14.383	2.6248
Ethane	0.1111	2.665	0.4865
Propane	0.0681	1.634	0.2983
Isobutane	0.0194	0.465	0.0849
n-Butane	0.0397	0.952	0.1738
Isopentane	0.0199	0.477	0.0870
n-Pentane	0.0177	0.425	0.0776
Cyclopentane	<0.0001	0.001	0.0001
n-Hexane	0.0134	0.321	0.0586
Cyclohexane	0.0085	0.205	0.0374
Other Hexanes	0.0213	0.510	0.0931
Heptanes	0.0284	0.681	0.1243
Methylcyclohexane	0.0167	0.400	0.0730
2,2,4-Trimethylpentane	<0.0001	<0.001	0.0001
Benzene	0.0123	0.296	0.0539
Toluene	0.0132	0.316	0.0577
Ethylbenzene	0.0003	0.006	0.0012
Xylenes	0.0052	0.125	0.0229
C8+ Heavies	0.0014	0.033	0.0061
Total Emissions	0.9957	23.898	4.3614
Total Hydrocarbon Emissions	0.9957	23.898	4.3614
Total VOC Emissions	0.2854	6.850	1.2501
Total HAP Emissions	0.0444	1.065	0.1944
Total BTEX Emissions	0.0310	0.744	0.1357

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	11.9949	287.878	52.5378
Ethane	2.2322	53.573	9.7771
Propane	1.3981	33.554	6.1236
Isobutane	0.4099	9.839	1.7956
n-Butane	0.8578	20.587	3.7571
Isopentane	0.4784	11.481	2.0952

Component	lbs/hr	lbs/day	tons/yr
n-Pentane	0.4545	10.909	1.9908
Cyclopentane	0.0008	0.020	0.0037
n-Hexane	0.4693	11.263	2.0554
Cyclohexane	0.3611	8.667	1.5817
Other Hexanes	0.6615	15.877	2.8975
Heptanes	1.8583	44.599	8.1394
Methylcyclohexane	1.0960	26.304	4.8004
2,2,4-Trimethylpentane	0.0008	0.020	0.0036
Benzene	0.4852	11.645	2.1252
Toluene	1.2785	30.683	5.5997
Ethylbenzene	0.0606	1.455	0.2655
Xylenes	1.5254	36.610	6.6814
C8+ Heavies	13.6375	327.300	59.7322
Total Emissions	39.2609	942.263	171.9630
Total Hydrocarbon Emissions	39.2609	942.263	171.9630
Total VOC Emissions	25.0338	600.811	109.6480
Total HAP Emissions	3.8198	91.676	16.7308
Total BTEX Emissions	3.3497	80.393	14.6717

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0348	0.836	0.1525
Ethane	0.0062	0.148	0.0271
Propane	0.0031	0.074	0.0136
Isobutane	0.0007	0.018	0.0032
n-Butane	0.0013	0.031	0.0057
Isopentane	0.0006	0.015	0.0028
n-Pentane	0.0005	0.012	0.0022
Cyclopentane	<0.0001	<0.001	<0.0001
n-Hexane	0.0003	0.007	0.0013
Cyclohexane	0.0001	0.001	0.0003
Other Hexanes	0.0006	0.013	0.0024
Heptanes	0.0006	0.014	0.0025
Methylcyclohexane	0.0001	0.003	0.0006
2,2,4-Trimethylpentane	<0.0001	<0.001	<0.0001
Benzene	<0.0001	<0.001	<0.0001
Toluene	<0.0001	<0.001	0.0001
Ethylbenzene	<0.0001	<0.001	<0.0001
Xylenes	<0.0001	<0.001	<0.0001
C8+ Heavies	0.0004	0.009	0.0017
Total Emissions	0.0494	1.184	0.2162
Total Hydrocarbon Emissions	0.0494	1.184	0.2162
Total VOC Emissions	0.0083	0.200	0.0365
Total HAP Emissions	0.0003	0.008	0.0015
Total BTEX Emissions	<0.0001	0.001	0.0002

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0697	1.672	0.3051
Ethane	0.0124	0.297	0.0542
Propane	0.0062	0.149	0.0272
Isobutane	0.0015	0.035	0.0065
n-Butane	0.0026	0.062	0.0113

Isopentane	0.0013	0.031	0.0056
n-Pentane	0.0010	0.024	0.0044
Cyclopentane	<0.0001	<0.001	<0.0001
n-Hexane	0.0006	0.015	0.0027
Cyclohexane	0.0001	0.003	0.0005
Other Hexanes	0.0011	0.026	0.0048
Heptanes	0.0012	0.028	0.0050
Methylcyclohexane	0.0003	0.007	0.0012
2,2,4-Trimethylpentane	<0.0001	<0.001	<0.0001
Benzene	<0.0001	0.001	0.0001
Toluene	<0.0001	0.001	0.0001
Ethylbenzene	<0.0001	<0.001	<0.0001
Xylenes	<0.0001	<0.001	0.0001
C8+ Heavies	0.0008	0.019	0.0035
Total Emissions	0.0987	2.369	0.4323
Total Hydrocarbon Emissions	0.0987	2.369	0.4323
Total VOC Emissions	0.0167	0.400	0.0731
Total HAP Emissions	0.0007	0.016	0.0030
Total BTEX Emissions	0.0001	0.002	0.0003

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.6341	15.218	2.7774
Ethane	0.1172	2.814	0.5135
Propane	0.0712	1.709	0.3119
Isobutane	0.0201	0.483	0.0882
n-Butane	0.0410	0.983	0.1794
Isopentane	0.0205	0.492	0.0898
n-Pentane	0.0182	0.438	0.0799
Cyclopentane	<0.0001	0.001	0.0001
n-Hexane	0.0137	0.329	0.0600
Cyclohexane	0.0086	0.206	0.0377
Other Hexanes	0.0218	0.523	0.0955
Heptanes	0.0289	0.695	0.1268
Methylcyclohexane	0.0168	0.404	0.0737
2,2,4-Trimethylpentane	<0.0001	<0.001	0.0001
Benzene	0.0123	0.296	0.0540
Toluene	0.0132	0.317	0.0578
Ethylbenzene	0.0003	0.006	0.0012
Xylenes	0.0052	0.126	0.0229
C8+ Heavies	0.0018	0.043	0.0078
Total Emissions	1.0451	25.082	4.5775
Total Hydrocarbon Emissions	1.0451	25.082	4.5775
Total VOC Emissions	0.2937	7.050	1.2866
Total HAP Emissions	0.0447	1.074	0.1959
Total BTEX Emissions	0.0310	0.745	0.1359

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction

Methane	52.8429	2.7774	94.74
Ethane	9.8313	0.5135	94.78
Propane	6.1507	0.3119	94.93
Isobutane	1.8020	0.0882	95.11
n-Butane	3.7685	0.1794	95.24
Isopentane	2.1008	0.0898	95.72
n-Pentane	1.9953	0.0799	96.00
Cyclopentane	0.0037	0.0001	96.48
n-Hexane	2.0581	0.0600	97.09
Cyclohexane	1.5822	0.0377	97.62
Other Hexanes	2.9023	0.0955	96.71
Heptanes	8.1444	0.1268	98.44
Methylcyclohexane	4.8017	0.0737	98.47
2,2,4-Trimethylpentane	0.0037	0.0001	98.42
Benzene	2.1253	0.0540	97.46
Toluene	5.5998	0.0578	98.97
Ethylbenzene	0.2655	0.0012	99.56
Xylenes	6.6814	0.0229	99.66
C8+ Heavies	59.7357	0.0078	99.99
Total Emissions	172.3953	4.5775	97.34
Total Hydrocarbon Emissions	172.3953	4.5775	97.34
Total VOC Emissions	109.7211	1.2866	98.83
Total HAP Emissions	16.7338	0.1959	98.83
Total BTEX Emissions	14.6720	0.1359	99.07

EQUIPMENT REPORTS:

CONDENSER AND COMBUSTION DEVICE

Condenser Outlet Temperature:	78.00 deg. F
Condenser Pressure:	14.70 psia
Condenser Duty:	9.05e-002 MM BTU/hr
Hydrocarbon Recovery:	1.56 bbls/day
Produced Water:	1.87 bbls/day
Ambient Temperature:	55.00 deg. F
Excess Oxygen:	5.00 %
Combustion Efficiency:	95.00 %
Supplemental Fuel Requirement:	9.05e-002 MM BTU/hr

Component	Emitted	Destroyed
Methane	5.00%	95.00%
Ethane	4.98%	95.02%
Propane	4.87%	95.13%
Isobutane	4.73%	95.27%
n-Butane	4.62%	95.38%
Isopentane	4.15%	95.85%
n-Pentane	3.90%	96.10%
Cyclopentane	3.49%	96.51%
n-Hexane	2.85%	97.15%
Cyclohexane	2.36%	97.64%
Other Hexanes	3.21%	96.79%
Heptanes	1.53%	98.47%
Methylcyclohexane	1.52%	98.48%
2,2,4-Trimethylpentane	1.52%	98.48%
Benzene	2.54%	97.46%

Toluene	1.03%	98.97%
Ethylbenzene	0.44%	99.56%
Xylenes	0.34%	99.66%
C8+ Heavies	0.01%	99.99%

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:	8.67 lbs. H2O/MMSCF
Temperature:	71.8 deg. F
Pressure:	74.1 psig
Dry Gas Flow Rate:	12.0000 MMSCF/day
Glycol Losses with Dry Gas:	0.0210 lb/hr
Wet Gas Water Content:	Subsaturated
Specified Wet Gas Water Content:	64.17 lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	10.80 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	13.50%	86.50%
Carbon Dioxide	99.92%	0.08%
Nitrogen	100.00%	0.00%
Methane	100.00%	0.00%
Ethane	99.98%	0.02%
Propane	99.95%	0.05%
Isobutane	99.91%	0.09%
n-Butane	99.88%	0.12%
Isopentane	99.85%	0.15%
n-Pentane	99.80%	0.20%
Cyclopentane	99.15%	0.85%
n-Hexane	99.56%	0.44%
Cyclohexane	98.14%	1.86%
Other Hexanes	99.69%	0.31%
Heptanes	98.92%	1.08%
Methylcyclohexane	97.33%	2.67%
2,2,4-Trimethylpentane	99.51%	0.49%
Benzene	84.34%	15.66%
Toluene	73.72%	26.28%
Ethylbenzene	56.72%	43.28%
Xylenes	45.52%	54.48%
C8+ Heavies	93.07%	6.93%

FLASH TANK

Flash Control:	Combustion device
Flash Control Efficiency:	50.00 %
Flash Temperature:	100.0 deg. F
Flash Pressure:	70.0 psig

Component	Left in Glycol	Removed in Flash Gas

Water	100.00%	0.00%
Carbon Dioxide	99.39%	0.61%
Nitrogen	91.60%	8.40%
Methane	91.85%	8.15%
Ethane	97.82%	2.18%
Propane	99.01%	0.99%
Isobutane	99.39%	0.61%
n-Butane	99.55%	0.45%
Isopentane	99.63%	0.37%
n-Pentane	99.71%	0.29%
Cyclopentane	99.93%	0.07%
n-Hexane	99.85%	0.15%
Cyclohexane	99.97%	0.03%
Other Hexanes	99.80%	0.20%
Heptanes	99.94%	0.06%
Methylcyclohexane	99.98%	0.02%
2,2,4-Trimethylpentane	99.87%	0.13%
Benzene	100.00%	0.00%
Toluene	100.00%	0.00%
Ethylbenzene	100.00%	0.00%
Xylenes	100.00%	0.00%
C8+ Heavies	99.99%	0.01%

REGENERATOR

Regenerator Stripping Gas:
Dry Product Gas
Stripping Gas Flow Rate: 5.0000 scfm

Component	Remaining in Glycol	Distilled Overhead
Water	60.28%	39.72%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.50%	99.50%
n-Pentane	0.50%	99.50%
Cyclopentane	0.50%	99.50%
n-Hexane	0.50%	99.50%
Cyclohexane	3.20%	96.80%
Other Hexanes	1.00%	99.00%
Heptanes	0.50%	99.50%
Methylcyclohexane	4.00%	96.00%
2,2,4-Trimethylpentane	1.50%	98.50%
Benzene	5.00%	95.00%
Toluene	7.90%	92.10%
Ethylbenzene	10.40%	89.60%
Xylenes	12.90%	87.10%
C8+ Heavies	12.00%	88.00%

STREAM REPORTS:

WET GAS STREAM

Temperature: 71.83 deg. F
Pressure: 88.78 psia
Flow Rate: 5.01e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.35e-001	3.21e+001
Carbon Dioxide	5.79e-002	3.36e+001
Nitrogen	3.42e-001	1.26e+002
Methane	8.83e+001	1.87e+004
Ethane	7.04e+000	2.79e+003
Propane	2.23e+000	1.30e+003
Isobutane	3.69e-001	2.83e+002
n-Butane	6.25e-001	4.80e+002
Isopentane	2.36e-001	2.24e+002
n-Pentane	1.81e-001	1.72e+002
Cyclopentane	9.99e-005	9.24e-002
n-Hexane	8.29e-002	9.43e+001
Cyclohexane	1.70e-002	1.89e+001
Other Hexanes	1.56e-001	1.77e+002
Heptanes	1.24e-001	1.64e+002
Methylcyclohexane	3.10e-002	4.01e+001
2,2,4-Trimethylpentane	9.99e-005	1.51e-001
Benzene	3.00e-003	3.09e+000
Toluene	3.99e-003	4.86e+000
Ethylbenzene	9.99e-005	1.40e-001
Xylenes	2.00e-003	2.80e+000
C8+ Heavies	8.69e-002	1.95e+002
Total Components	100.00	2.48e+004

DRY GAS STREAM

Temperature: 71.83 deg. F
Pressure: 88.78 psia
Flow Rate: 5.00e+005 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.83e-002	4.34e+000
Carbon Dioxide	5.80e-002	3.36e+001
Nitrogen	3.42e-001	1.26e+002
Methane	8.84e+001	1.87e+004
Ethane	7.05e+000	2.79e+003
Propane	2.23e+000	1.30e+003
Isobutane	3.70e-001	2.83e+002
n-Butane	6.25e-001	4.79e+002
Isopentane	2.36e-001	2.24e+002
n-Pentane	1.81e-001	1.72e+002
Cyclopentane	9.92e-005	9.16e-002
n-Hexane	8.26e-002	9.39e+001
Cyclohexane	1.67e-002	1.85e+001
Other Hexanes	1.56e-001	1.77e+002
Heptanes	1.23e-001	1.62e+002

Methylcyclohexane	3.02e-002	3.90e+001
2,2,4-Trimethylpentane	9.95e-005	1.50e-001
Benzene	2.53e-003	2.60e+000
Toluene	2.95e-003	3.58e+000
Ethylbenzene	5.67e-005	7.94e-002
Xylenes	9.10e-004	1.27e+000
C8+ Heavies	8.10e-002	1.82e+002
Total Components	100.00	2.48e+004

LEAN GLYCOL STREAM

Temperature: 71.83 deg. F
Flow Rate: 5.00e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.84e+001	2.77e+003
Water	1.50e+000	4.22e+001
Carbon Dioxide	9.96e-014	2.80e-012
Nitrogen	2.02e-014	5.67e-013
Methane	1.02e-018	2.87e-017
Ethane	9.54e-009	2.68e-007
Propane	9.05e-010	2.55e-008
Isobutane	2.58e-010	7.25e-009
n-Butane	5.05e-010	1.42e-008
Isopentane	6.17e-005	1.73e-003
n-Pentane	6.30e-005	1.77e-003
Cyclopentane	1.41e-007	3.95e-006
n-Hexane	7.39e-005	2.08e-003
Cyclohexane	4.12e-004	1.16e-002
Other Hexanes	2.00e-004	5.62e-003
Heptanes	3.15e-004	8.86e-003
Methylcyclohexane	1.59e-003	4.47e-002
2,2,4-Trimethylpentane	4.03e-007	1.13e-005
Benzene	9.05e-004	2.55e-002
Toluene	3.89e-003	1.09e-001
Ethylbenzene	2.50e-004	7.03e-003
Xylenes	8.03e-003	2.26e-001
C8+ Heavies	6.56e-002	1.84e+000
Total Components	100.00	2.81e+003

RICH GLYCOL STREAM

Temperature: 71.83 deg. F
Pressure: 88.78 psia
Flow Rate: 5.10e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.66e+001	2.77e+003
Water	2.44e+000	7.00e+001
Carbon Dioxide	9.77e-004	2.80e-002
Nitrogen	1.98e-004	5.66e-003
Methane	2.98e-002	8.55e-001

Ethane	1.98e-002	5.68e-001
Propane	2.18e-002	6.25e-001
Isobutane	8.43e-003	2.42e-001
n-Butane	2.00e-002	5.73e-001
Isopentane	1.21e-002	3.47e-001
n-Pentane	1.24e-002	3.54e-001
Cyclopentane	2.76e-005	7.91e-004
n-Hexane	1.45e-002	4.16e-001
Cyclohexane	1.26e-002	3.62e-001
Other Hexanes	1.96e-002	5.62e-001
Heptanes	6.18e-002	1.77e+000
Methylcyclohexane	3.90e-002	1.12e+000
2,2,4-Trimethylpentane	2.64e-005	7.55e-004
Benzene	1.78e-002	5.09e-001
Toluene	4.84e-002	1.39e+000
Ethylbenzene	2.36e-003	6.76e-002
Xylenes	6.11e-002	1.75e+000
C8+ Heavies	5.37e-001	1.54e+001
Total Components	100.00	2.86e+003

FLASH TANK OFF GAS STREAM

Temperature: 100.00 deg. F
Pressure: 84.70 psia
Flow Rate: 1.92e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.30e-002	5.74e-005
Carbon Dioxide	7.69e-002	1.71e-004
Nitrogen	3.35e-001	4.75e-004
Methane	8.58e+001	6.97e-002
Ethane	8.13e+000	1.24e-002
Propane	2.78e+000	6.21e-003
Isobutane	5.01e-001	1.47e-003
n-Butane	8.80e-001	2.59e-003
Isopentane	3.50e-001	1.28e-003
n-Pentane	2.77e-001	1.01e-003
Cyclopentane	1.56e-004	5.54e-007
n-Hexane	1.39e-001	6.06e-004
Cyclohexane	2.90e-002	1.24e-004
Other Hexanes	2.52e-001	1.10e-003
Heptanes	2.27e-001	1.15e-003
Methylcyclohexane	5.61e-002	2.79e-004
2,2,4-Trimethylpentane	1.73e-004	1.00e-006
Benzene	5.51e-003	2.18e-005
Toluene	7.23e-003	3.37e-005
Ethylbenzene	1.59e-004	8.54e-007
Xylenes	2.71e-003	1.46e-005
C8+ Heavies	9.14e-002	7.88e-004
Total Components	100.00	9.94e-002

FLASH TANK GLYCOL STREAM

Temperature: 100.00 deg. F
Flow Rate: 5.10e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.66e+001	2.77e+003
Water	2.44e+000	7.00e+001
Carbon Dioxide	9.71e-004	2.78e-002
Nitrogen	1.81e-004	5.18e-003
Methane	2.74e-002	7.85e-001
Ethane	1.94e-002	5.56e-001
Propane	2.16e-002	6.19e-001
Isobutane	8.38e-003	2.40e-001
n-Butane	1.99e-002	5.70e-001
Isopentane	1.21e-002	3.46e-001
n-Pentane	1.23e-002	3.53e-001
Cyclopentane	2.76e-005	7.90e-004
n-Hexane	1.45e-002	4.15e-001
Cyclohexane	1.26e-002	3.62e-001
Other Hexanes	1.96e-002	5.61e-001
Heptanes	6.18e-002	1.77e+000
Methylcyclohexane	3.90e-002	1.12e+000
2,2,4-Trimethylpentane	2.63e-005	7.54e-004
Benzene	1.78e-002	5.09e-001
Toluene	4.84e-002	1.39e+000
Ethylbenzene	2.36e-003	6.76e-002
Xylenes	6.11e-002	1.75e+000
C8+ Heavies	5.37e-001	1.54e+001
Total Components	100.00	2.86e+003

FLASH GAS EMISSIONS

Flow Rate: 4.32e+000 scfh
Control Method: Combustion Device
Control Efficiency: 50.00

Component	Conc. (vol%)	Loading (lb/hr)
Water	4.99e+001	1.02e-001
Carbon Dioxide	2.78e+001	1.39e-001
Nitrogen	1.49e-001	4.75e-004
Methane	1.91e+001	3.48e-002
Ethane	1.81e+000	6.19e-003
Propane	6.19e-001	3.10e-003
Isobutane	1.11e-001	7.37e-004
n-Butane	1.96e-001	1.29e-003
Isopentane	7.79e-002	6.39e-004
n-Pentane	6.18e-002	5.07e-004
Cyclopentane	3.47e-005	2.77e-007
n-Hexane	3.09e-002	3.03e-004
Cyclohexane	6.46e-003	6.19e-005
Other Hexanes	5.62e-002	5.51e-004
Heptanes	5.05e-002	5.75e-004
Methylcyclohexane	1.25e-002	1.40e-004
2,2,4-Trimethylpentane	3.85e-005	5.01e-007
Benzene	1.23e-003	1.09e-005
Toluene	1.61e-003	1.69e-005
Ethylbenzene	3.54e-005	4.27e-007
Xylenes	6.04e-004	7.29e-006

Component		
C8+ Heavies	2.03e-002	3.94e-004
Total Components	100.00	2.91e-001

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 9.86e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	5.94e+001	2.78e+001
Carbon Dioxide	4.20e-002	4.80e-002
Nitrogen	1.11e-001	8.09e-002
Methane	2.88e+001	1.20e+001
Ethane	2.86e+000	2.23e+000
Propane	1.22e+000	1.40e+000
Isobutane	2.71e-001	4.10e-001
n-Butane	5.68e-001	8.58e-001
Isopentane	2.55e-001	4.78e-001
n-Pentane	2.42e-001	4.55e-001
Cyclopentane	4.62e-004	8.41e-004
n-Hexane	2.10e-001	4.69e-001
Cyclohexane	1.65e-001	3.61e-001
Other Hexanes	2.95e-001	6.62e-001
Heptanes	7.14e-001	1.86e+000
Methylcyclohexane	4.30e-001	1.10e+000
2,2,4-Trimethylpentane	2.80e-004	8.32e-004
Benzene	2.39e-001	4.85e-001
Toluene	5.34e-001	1.28e+000
Ethylbenzene	2.20e-002	6.06e-002
Xylenes	5.53e-001	1.53e+000
C8+ Heavies	3.08e+000	1.36e+001
Total Components	100.00	6.72e+001

CONDENSER PRODUCED WATER STREAM

Temperature: 78.00 deg. F
Flow Rate: 5.44e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	1.00e+002	2.72e+001	999859.
Carbon Dioxide	1.69e-004	4.59e-005	2.
Nitrogen	5.55e-006	1.51e-006	0.
Methane	1.76e-003	4.79e-004	18.
Ethane	4.28e-004	1.17e-004	4.
Propane	1.78e-004	4.86e-005	2.
Isobutane	2.92e-005	7.96e-006	0.
n-Butane	8.36e-005	2.28e-005	1.
Isopentane	3.15e-005	8.59e-006	0.
n-Pentane	3.13e-005	8.52e-006	0.
Cyclopentane	4.24e-007	1.16e-007	0.
n-Hexane	2.15e-005	5.85e-006	0.
Cyclohexane	8.97e-005	2.44e-005	1.
Other Hexanes	2.65e-005	7.21e-006	0.

Heptanes	2.68e-005	7.31e-006	0.
Methylcyclohexane	8.72e-005	2.37e-005	1.
2,2,4-Trimethylpentane	7.70e-009	2.10e-009	0.
Benzene	4.61e-003	1.25e-003	46.
Toluene	4.40e-003	1.20e-003	44.
Ethylbenzene	7.24e-005	1.97e-005	1.
Xylenes	2.07e-003	5.64e-004	21.
C8+ Heavies	4.82e-007	1.31e-007	0.
Total Components	100.00	2.72e+001	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 78.00 deg. F
Flow Rate: 4.55e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	1.66e-002	3.21e-003
Carbon Dioxide	4.48e-004	8.67e-005
Nitrogen	1.09e-004	2.12e-005
Methane	4.62e-002	8.93e-003
Ethane	5.62e-002	1.09e-002
Propane	1.86e-001	3.60e-002
Isobutane	1.14e-001	2.21e-002
n-Butane	3.33e-001	6.44e-002
Isopentane	4.18e-001	8.10e-002
n-Pentane	5.17e-001	1.00e-001
Cyclopentane	1.32e-003	2.55e-004
n-Hexane	1.04e+000	2.01e-001
Cyclohexane	9.84e-001	1.90e-001
Other Hexanes	1.22e+000	2.36e-001
Heptanes	6.67e+000	1.29e+000
Methylcyclohexane	3.94e+000	7.62e-001
2,2,4-Trimethylpentane	3.00e-003	5.80e-004
Benzene	1.23e+000	2.38e-001
Toluene	5.24e+000	1.01e+000
Ethylbenzene	2.86e-001	5.52e-002
Xylenes	7.34e+000	1.42e+000
C8+ Heavies	7.04e+001	1.36e+001
Total Components	100.00	1.93e+001

CONDENSER VENT STREAM

Temperature: 78.00 deg. F
Pressure: 14.70 psia
Flow Rate: 3.58e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.28e+000	5.58e-001
Carbon Dioxide	1.15e-001	4.79e-002
Nitrogen	3.06e-001	8.09e-002
Methane	7.92e+001	1.20e+001
Ethane	7.82e+000	2.22e+000
Propane	3.27e+000	1.36e+000

Isobutane	7.07e-001	3.88e-001
n-Butane	1.45e+000	7.93e-001
Isopentane	5.83e-001	3.97e-001
n-Pentane	5.21e-001	3.55e-001
Cyclopentane	8.86e-004	5.87e-004
n-Hexane	3.29e-001	2.68e-001
Cyclohexane	2.15e-001	1.71e-001
Other Hexanes	5.23e-001	4.25e-001
Heptanes	6.00e-001	5.67e-001
Methylcyclohexane	3.60e-001	3.34e-001
2,2,4-Trimethylpentane	2.34e-004	2.53e-004
Benzene	3.34e-001	2.46e-001
Toluene	3.03e-001	2.64e-001
Ethylbenzene	5.34e-003	5.35e-003
Xylenes	1.04e-001	1.05e-001
C8+ Heavies	1.72e-002	2.77e-002
Total Components	100.00	2.06e+001

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.72e+001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	8.22e+001	5.99e-001
Ethane	8.13e+000	1.11e-001
Propane	3.40e+000	6.81e-002
Isobutane	7.34e-001	1.94e-002
n-Butane	1.50e+000	3.97e-002
Isopentane	6.06e-001	1.99e-002
n-Pentane	5.41e-001	1.77e-002
Cyclopentane	9.20e-004	2.93e-005
n-Hexane	3.42e-001	1.34e-002
Cyclohexane	2.23e-001	8.53e-003
Other Hexanes	5.43e-001	2.13e-002
Heptanes	6.23e-001	2.84e-002
Methylcyclohexane	3.74e-001	1.67e-002
2,2,4-Trimethylpentane	2.43e-004	1.26e-005
Benzene	3.47e-001	1.23e-002
Toluene	3.15e-001	1.32e-002
Ethylbenzene	5.55e-003	2.68e-004
Xylenes	1.08e-001	5.23e-003
C8+ Heavies	1.79e-002	1.39e-003
Total Components	100.00	9.96e-001

March 2, 2017

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

For: SLR International Corporation
8 Capitol Street, Suite 300
Charleston, West Virginia 25301

Sample: Cabot / Cranberry Pipeline
Staten Run Pre-Dehydrator Gas
Spot Sample @ 78 psig & NA °F

Date Sampled: 02/21/2017 Job Number: 71606.071

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286

COMPONENT	MOL%	GPM
Nitrogen	0.342	
Carbon Dioxide	0.058	
Methane	88.393	
Ethane	7.052	1.881
Propane	2.235	0.614
Isobutane	0.370	0.121
n-Butane	0.615	0.193
2-2 Dimethylpropane	0.011	0.004
Isopentane	0.236	0.086
n-Pentane	0.181	0.065
Hexanes	0.239	0.098
Heptanes Plus	0.268	0.118
Totals	100.000	3.181

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.553	(Air=1)
Molecular Weight	102.62	
Gross Heating Value	5390	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	0.650	(Air=1)
Compressibility (Z)	0.9972	
Molecular Weight	18.77	
Gross Heating Value		
Dry Basis	1149	BTU/CF
Saturated Basis	1129	BTU/CF

Base Conditions: 14.650 PSI & 60 Deg F

Sampled By: SLR-RSJ
Analyst: NG
Processor: NG
Cylinder ID: T-3547

Certified: FESCO, Ltd. - Alice, Texas

David Dannhaus 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286
TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Nitrogen	0.342		0.510
Carbon Dioxide	0.058		0.136
Methane	88.393		75.549
Ethane	7.052	1.881	11.297
Propane	2.235	0.614	5.251
Isobutane	0.370	0.121	1.146
n-Butane	0.615	0.193	1.904
2,2 Dimethylpropane	0.011	0.004	0.042
Isopentane	0.236	0.086	0.907
n-Pentane	0.181	0.065	0.696
2,2 Dimethylbutane	0.014	0.006	0.064
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.021	0.009	0.096
2 Methylpentane	0.077	0.032	0.354
3 Methylpentane	0.044	0.018	0.202
n-Hexane	0.083	0.034	0.381
Methylcyclopentane	0.016	0.005	0.072
Benzene	0.003	0.001	0.012
Cyclohexane	0.017	0.006	0.076
2-Methylhexane	0.023	0.011	0.123
3-Methylhexane	0.022	0.010	0.117
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.030	0.013	0.159
n-Heptane	0.033	0.015	0.176
Methylcyclohexane	0.031	0.012	0.162
Toluene	0.004	0.001	0.020
Other C8's	0.048	0.022	0.282
n-Octane	0.016	0.008	0.097
Ethylbenzene	0.000	0.000	0.000
M & P Xylenes	0.002	0.001	0.011
O-Xylene	0.000	0.000	0.000
Other C9's	0.016	0.008	0.108
n-Nonane	0.004	0.002	0.027
Other C10's	0.002	0.001	0.015
n-Decane	0.001	0.001	0.008
Undecanes (11)	0.000	0.000	0.000
Totals	100.000	3.181	100.000

Computed Real Characteristics of Total Sample

Specific Gravity	0.650	(Air=1)
Compressibility (Z)	0.9972	
Molecular Weight	18.77	

Gross Heating Value

Dry Basis	1149	BTU/CF
Saturated Basis	1129	BTU/CF

March 2, 2017

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

Sample: Cabot / Cranberry Pipeline
Staten Run Pre-Dehydrator Gas
Spot Sample @ 78 psig & NA °F

Date Sampled: 02/21/2017 Job Number: 71606.071

GLYCALC FORMAT

COMPONENT	MOL%	GPM	Wt %
Carbon Dioxide	0.058		0.136
Hydrogen Sulfide	----		----
Nitrogen	0.342		0.510
Methane	88.393		75.549
Ethane	7.052	1.881	11.297
Propane	2.235	0.614	5.251
Isobutane	0.370	0.121	1.146
n-Butane	0.626	0.198	1.946
Isopentane	0.236	0.086	0.907
n-Pentane	0.181	0.065	0.696
Cyclopentane	0.000	0.000	0.000
n-Hexane	0.083	0.034	0.381
Cyclohexane	0.017	0.006	0.076
Other C6's	0.156	0.064	0.716
Heptanes	0.124	0.054	0.647
Methylcyclohexane	0.031	0.012	0.162
2,2,4 Trimethylpentane	0.000	0.000	0.000
Benzene	0.003	0.001	0.012
Toluene	0.004	0.001	0.020
Ethylbenzene	0.000	0.000	0.000
Xylenes	0.002	0.001	0.011
Octanes Plus	0.087	0.043	0.537
Totals	100.000	3.181	100.000

Real Characteristics Of Octanes Plus:

Specific Gravity	4.010	(Air=1)
Molecular Weight	115.81	
Gross Heating Value	5939	BTU/CF

Real Characteristics Of Total Sample:

Specific Gravity	0.650	(Air=1)
Compressibility (Z)	0.9972	
Molecular Weight	18.77	
Gross Heating Value		
Dry Basis	1149	BTU/CF
Saturated Basis	1129	BTU/CF

ATTACHMENT L – 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]
RBV-1	001-04A	FLAMECO; Dehydration Unit Reboiler; Model No. SB20-12	2011	Existing	0.75	1,020

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 L – 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]	#4		
Engine Manufacturer/Model	AJAX / DPC 120		
Manufacturers Rated bhp/rpm	115/475		
Source Status[2]	MS		
Date Installed/ Modified/Removed/Relocated[3]	7/2013		
Engine Manufactured /Reconstruction Date[4]	1965		
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]	2SLB		
APCD Type[7]	None		
Fuel Type[8]	PQ		
H_2S (gr/100 scf)	0.25		
Operating bhp/rpm	115/475		
BSFC (BTU/bhp-hr)	9,000		
Hourly Fuel Throughput	1,015.0 ft^3/hr		
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	8.90 $MMft^3/yr$		
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	1.40	6.11				
MD	CO	0.43	1.89				
MD	VOC	0.26	1.11				
AP	SO_2	<0.01	0.01				
AP	PM_{10}	0.05	0.22				
MD	Formaldehyde	0.08	0.34				
AP	Total HAPs	0.10	0.44				
AP	GHG (CO_2e)	121.11	530.44				

1 Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion compressor/generator engine located at the compressor station. Multiple compressor 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.

Estimated Exhaust Emissions Based On PLQNG, 1500 FASL Elevation and an average Ambient Temperature of 65 Degrees F

For Emissions Permits, please contact Ajax for emissions data based on specific site conditions

Ajax Engine Model	Emissions (Gm / Bhph)					BSFC	RPM	BHP	BMEP	Exhaust Stack						No. Of Cyl's	Bore	Stroke
	NOx	CO	HCT	NMHC	CH2O					Dia. (in.)	Height (in.)	Temp (Deg.F)	Flow (acfm)	Flow (lb/m)	Velocity (ft/m)			
EA-15	4.4	3.3	7.7	1.3	0.3	9900	900	14	49.6	4	31	500	140	5	1604	1	5	6.5
EA-22	4.4	3.3	7.7	1.3	0.3	9900	650	21	48.5	5	64	500	200	8	1467	1	6.5	8
EA-30	4.4	3.3	7.7	1.3	0.3	9900	650	29	53.1	5	80	500	250	10	1833	1	7.25	8
C-30	4.4	3.3	7.7	1.3	0.3	9400	525	29	49.2	5	101	450	260	11	1907	1	7.5	10
C-42	4.4	3.3	7.7	1.3	0.3	9900	525	40	53.6	6	137	565	380	14	1935	1	8.5	10
E-42	4.4	3.3	7.7	1.3	0.3	9900	525	40	53.6	6	137	565	380	14	1935	1	8.5	10
DP-60	4.4	1.7	4.4	1.0	0.3	9000	475	58	56.5	8	150	540	500	18	1432	1	9.5	12
DP-80	4.4	2.8	9.6	1.5	0.3	8900	400	77	57.1	10	164	470	610	24	1118	1	11.0	14
DP-81	6.6	1.1	3.8	0.9	0.3	8500	475	78	62.4	10	164	545	610	22	1118	1	10.5	12
DP-115	4.4	2.4	12.7	1.9	0.3	9000	360	110	55.0	12	190	440	880	36	1120	1	13.25	16
DP-125	5.0	2.7	12.0	1.8	0.3	8500	380	120	56.7	12	190	470	960	38	1222	1	13.25	16
DP-160	4.4	2.8	9.6	1.8	0.3	8900	400	154	57.1	10	164	470	1220	48	2237	2	11	14
DP-165	6.0	3.0	12.0	1.8	0.3	8500	380	158	58.4	13.25	260	450	1210	49	1264	1	15	16
DP-230	4.4	2.4	14.0	1.9	0.3	9000	360	221	55.0	12	190	440	1770	72	2254	2	13.25	16
DP-250	5.5	3.0	11.0	1.7	0.3	8500	380	240	56.7	12	190	460	1910	76	2432	2	13.25	16
DP-325	5.5	1.7	12.0	1.9	0.3	8400	380	312	57.5	13.25	260	450	2420	98	2527	2	15	16
DPC-60	4.4	1.7	4.4	1.0	0.3	9000	475	58	56.5	8	150	540	500	18	1432	1	9.5	12
DPC-80	4.4	2.8	8.8	1.5	0.3	8900	400	77	57.1	10	164	470	610	24	1118	1	11	14
DPC-81	6.6	1.1	3.8	0.9	0.3	8500	475	78	62.4	10	164	545	610	22	1118	1	10.5	12
DPC-105	4.4	2.8	6.6	1.2	0.3	8800	425	101	59.3	12	193	480	780	31	993	1	12	14
DPC-115	4.4	2.4	12.7	1.9	0.3	8700	360	110	55.0	12	190	440	870	36	1108	1	13.25	16
DPC-115 LE	2.0	2.2	7.7	1.3	0.3	8100	360	110	55.0	12	190	400	840	36	1070	1	13.25	16
DPC-120	5.5	1.7	4.4	1.0	0.3	9000	475	115	56.5	8	150	540	1000	37	2865	2	9.5	12
DPC-140	10.5	1.3	6.8	1.2	0.3	8200	400	134	60.3	12	190	490	1040	40	1324	1	13.25	16
DPC-140 LE	2.0	1.4	5.5	1.1	0.3	7800	400	134	60.3	12	190	450	1010	41	1286	1	13.25	16
DPC-160	4.4	2.7	8.8	1.4	0.3	8900	400	154	57.1	10	164	470	1220	48	2237	2	11	14
DPC-162	6.6	1.1	3.8	0.9	0.3	8500	475	156	62.4	10	164	545	1230	45	2255	2	10.5	12
DPC-180	6.3	1.4	14.6	2.1	0.3	8400	400	173	60.5	13.25	256	460	1290	52	1347	1	15	16
DPC-180 LE	2.0	1.1	6.6	1.2	0.3	7900	400	173	60.5	13.25	256	555	1450	53	1514	1	15	16

Site Altitude = 0 - 1500 FASL Date: August 2004

Site Fuel Composition = Pipeline Quality Natural Gas (PLQNG)

Ambient Temp For Defining Maximum Load = 100 Deg F

Ambient Temp For Defining Exhaust Emissions = 65 Deg F

NOx = Nitrogen Oxide

CO = Carbon Monoxide

HCT = Total Unburned Hydrocarbons

NMHC= Non-Methane Hydrocarbons

CH2O = Formaldehyde

FASL = Feet Above Sea Level

ACFM = Actual Cubic Feet Per Minute

BMEP = Brake Mean Effective Pressure

BSFC = Brake Specific Fuel Consumption

The above emissions and performance data is contingent on:

1.) Engine must be maintained in good working order.

2.) Engine modifications or upgrades from the original factory configuration must meet Ajax specifications and installation guidelines.

3.) Engine operating parameters must be consistent with those specified in the Ajax manual.

Prepared By: Bruce Chrisman

Phone (405) 619-5058

Email: chrismanb@ccc-ces.com

Fuel Composition (PLQNG):

Compound	Formula	% Volume
Nitrogen	N2	0.72
Carbon Dioxide	CO2	1.14
Methane	CH4	92.84
Ethane	C2H6	4.10
Propane	C3H8	1.20
	Total Volume % =	100.00

Estimated Exhaust Emissions Based On PLQNG, 1500 FASL Elevation and an average Ambient Temperature of 65 Degrees F

For Emissions Permits, please contact Ajax for emissions data based on specific site conditions

Ajax Engine Model	Emissions (Gm / Bhph)					BSFC	RPM	BHP	BMEP	Exhaust Stack						No. Of Cyl's	Bore	Stroke
	NOx	CO	HCT	NMHC	CH2O					Dia. (in.)	Height (in.)	Temp (Deg.F)	Flow (acfm)	Flow (lb/m)	Velocity (ft/m)			
DPC-230	4.4	2.4	12.7	1.8	0.3	8700	360	221	55.0	12	190	440	1730	71	2203	2	13.25	16
DPC-230 LE	2.0	2.2	7.7	1.3	0.3	8100	360	221	55.0	12	190	400	1670	72	2126	2	13.25	16
DPC-280	11.4	1.3	6.8	1.2	0.3	8200	400	269	60.3	12	190	470	2030	80	2585	2	13.25	16
DPC-280 LE	2.0	1.4	5.5	1.1	0.3	7800	400	269	60.3	12	190	450	1990	81	2534	2	13.25	16
DPC-300	4.1	1.9	16.0	2.2	0.3	8700	360	288	56.0	13.25	260	435	2210	91	2308	2	15	16
DPC-300 LE	2.0	1.6	8.8	1.4	0.3	8200	360	288	56.0	13.25	260	435	2230	92	2329	2	15	16
DPC-360	6.3	1.4	14.6	2.1	0.3	8400	400	346	60.5	13.25	260	480	2630	103	2747	2	15	16
DPC-360 LE	2.0	1.1	6.4	1.2	0.3	7900	400	346	60.5	13.25	260	480	2690	105	2809	2	15	16
DPC-450 LE	2.7	1.2	6.0	1.1	0.3	7800	400	432	64.6	17.25	190	500	3220	124	1984	3	13.25	16
DPC-540	8.6	1.3	12.3	1.4	0.3	8300	400	540	63.0	17.25	303	465	3890	155	2397	3	15	16
DPC-540 LE	2.0	1.0	6.0	1.1	0.3	7800	400	540	63.0	17.25	303	465	3970	158	2446	3	15	16
DPC-600	13.0	1.2	8.5	1.6	0.3	8200	400	576	67.2	17.25	303	515	4110	155	2532	3	15	16
DPC-600 LE	6.5	0.9	5.9	1.1	0.3	7800	400	576	67.2	17.25	303	515	4190	158	2582	3	15	16
DPC-720	9.5	1.3	9.0	1.8	0.3	8300	400	720	63.0	17.25	241	465	5190	207	3198	4	15	16
DPC-720 LE	2.0	1.0	6.0	1.1	0.3	7800	400	720	63.0	17.25	241	465	5300	211	3266	4	15	16
DPC-800	13.0	1.2	8.5	1.8	0.3	8200	400	768	67.2	17.25	241	515	5480	207	3377	4	15	16
DPC-800 LE	6.5	1.0	5.9	1.1	0.3	7800	400	768	67.2	17.25	241	515	5590	211	3444	4	15	16
DPC-2201	10.0	1.3	5.5	1.1	0.3	8000	440	148	60.4	12	190	490	1160	45	1477	1	13.25	16
DPC-2201 LE	2.0	1.4	5.4	1.2	0.3	7800	440	148	60.4	12	190	490	1200	47	1528	1	13.25	16
DPC-2202	10.0	1.3	5.5	1.1	0.3	8000	440	296	60.4	12	190	470	2280	90	2903	2	13.25	16
DPC-2202 LE	2.0	1.4	5.4	1.2	0.3	7800	440	296	60.4	12	190	470	2350	93	2992	2	13.25	16
DPC-2801	5.5	1.4	10.5	1.7	0.3	8200	440	192	61.1	13.25	256	460	1450	58	1514	1	15	16
DPC-2801 LE	2.0	1.2	6.1	1.2	0.3	7800	440	192	61.1	13.25	256	460	1490	60	1556	1	15	16
DPC-2802	5.5	1.3	10.5	1.7	0.3	8200	440	422	70.1	13.25	260	465	2910	116	3039	2	15	16
DPC-2802 LE	2.0	1.2	6.1	1.2	0.3	7800	440	384	61.1	13.25	260	465	3000	119	3133	2	15	16
DPC-2802 LE*	2.0	1.2	6.1	1.2	0.3	7800	440	384	61.1	14.13	260	465	3000	119	2757	2	15	16
DPC-2803	12.0	1.2	9.9	1.6	0.3	8000	440	634	67.3	17.25	303	465	4380	174	2699	3	15	16
DPC-2803 LE	2.0	1.2	6.1	1.2	0.3	7800	440	600	63.7	17.25	241	515	4740	179	2921	3	15	16
DPC-2804	12.0	1.2	9.9	1.6	0.3	8000	440	845	67.2	17.25	241	465	5840	233	3598	4	15	16
DPC-2804 LE	2.0	1.2	6.1	1.2	0.3	7800	440	800	63.7	17.25	241	515	6320	239	3894	4	15	16

Site Altitude = 0 - 1500 FASL Date: August 2004

Site Fuel Composition = Pipeline Quality Natural Gas (PLQNG)

Ambient Temp For Defining Maximum Load = 100 Deg F

Ambient Temp For Defining Exhaust Emissions = 65 Deg F

NOx = Nitrogen Oxide

CO = Carbon Monoxide

HCT = Total Unburned Hydrocarbons

NMHC= Non-Methane Hydrocarbons

CH2O = Formaldehyde

FASL = Feet Above Sea Level

ACFM = Actual Cubic Feet Per Minute

BMEP = Brake Mean Effective Pressure

BSFC = Brake Specific Fuel Consumption

The above emissions and performance data is contingent on:

1.) Engine must be maintained in good working order.

2.) Engine modifications or upgrades from the original factory configuration must meet Ajax specifications and installation guidelines.

3.) Engine operating parameters must be consistent with those specified in the Ajax manual.

* = DPC-2802LE Tilt Muffler Package

Fuel Composition (PLQNG):

Compound	Formula	% Volume
Nitrogen	N2	0.72
Carbon Dioxide	CO2	1.14
Methane	CH4	92.84
Ethane	C2H6	4.10
Propane	C3H8	1.20
	Total Volume % =	100.00

Prepared By: Bruce Chrisman, (405) 619-5058

Email: chrismanb@ccc-ces.com

ATTACHMENT L - STORAGE VESSEL DATA SHEET

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

The following information is REQUIRED:

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

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

Additional information may be requested if necessary.

GENERAL INFORMATION

1. Bulk Storage Area Name Staten Run Compressor Station	2. Tank Name Pipeline Liquids AST
3. Emission Unit ID number T03	4. Emission Point ID number T03
5. Date Installed , Modified or Relocated *(for existing tanks)* 2011 Was the tank manufactured after August 23, 2011? ☐ Yes ☒ No	6. Type of change: ☐ New construction ☐ New stored material ☒ Other ☐ Relocation
7A. Description of Tank Modification *(if applicable)* Increase Throughput through storage tank	
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 SEE ATTACHED PRESSURIZED SEPARATOR SAMPLING & EMISSIONS ESTIMATION REPORT ***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. 2100 gallons	
9A. Tank Internal Diameter (ft.)	9B. Tank Internal Height (ft.)
10A. Maximum Liquid Height (ft.)	10B. Average Liquid Height (ft.)
11A. Maximum Vapor Space Height (ft.)	11B. Average Vapor Space Height (ft.)
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume"	
13A. Maximum annual throughput (gal/yr) 76,650 gal/yr	13B. Maximum daily throughput (gal/day) 210 gal/day
14. Number of tank turnovers per year 73	15. Maximum tank fill rate (gal/min) 0.15 gal/min
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 Pressure Setting

☐ Thief Hatch Weighted ☐ Yes ☐ No

[1] Complete appropriate Air Pollution Control Device Sheet

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

Material Name	**Flashing Loss**		**Working/Breathing Loss**		**Total Emissions Loss**		**Estimation Method[1]**
	lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	
VOCs							

[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 Seams.

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

22. Shell Condition (if metal and unlined):

☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

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

23. Operating Pressure Range (psig):

Must be listed for tanks using VRUs with closed vent system.

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

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:			
30. Daily Avg. Ambient Temperature (°F):		31. Annual Avg. Maximum Temperature (°F):	
32. Annual Avg. Minimum Temperature (°F):		33. Avg. Wind Speed (mph):	
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):		35. Atmospheric Pressure (psia):	
LIQUID INFORMATION			
36. Avg. daily temperature range of bulk liquid (°F):	36A. Minimum (°F):	36B. Maximum (°F):	
37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):	37B. Maximum (psig):	
38A. Minimum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39A. Avg. liquid surface temperature (°F):		39B. Corresponding vapor pressure (psia):	
40A. Maximum liquid surface temperature (°F):		40B. Corresponding vapor pressure (psia):	
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary. SEE PROMAX MODEL IN CALCULATIONS			
41A. Material name and composition:			
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):			
41E. Vapor molecular weight (lb/lb-mole):			
41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

ATTACHMENT L - STORAGE VESSEL DATA SHEET

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

The following information is REQUIRED:

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

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

Additional information may be requested if necessary.

GENERAL INFORMATION

1. Bulk Storage Area Name Staten Run Compressor Station	2. Tank Name Pipeline Liquids AST
3. Emission Unit ID number T05 & T06	4. Emission Point ID number T05 & T06
5. Date Installed , Modified or Relocated *(for existing tanks)* 2013 Was the tank manufactured after August 23, 2011? ☐ Yes ☒ No	6. Type of change: ☐ New construction ☐ New stored material ☒ Other ☐ Relocation
7A. Description of Tank Modification *(if applicable)*	
7B. Will more than one material be stored in this tank? *If so, a separate form must be completed for each material.* ☐ Yes ☒ No	
7C. Was USEPA Tanks simulation software utilized? ☐ Yes ☒ No SEE ATTACHED PRESSURIZED SEPARATOR SAMPLING & EMISSIONS ESTIMATION REPORT ***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. 2100 gallons	
9A. Tank Internal Diameter (ft.)	9B. Tank Internal Height (ft.)
10A. Maximum Liquid Height (ft.)	10B. Average Liquid Height (ft.)
11A. Maximum Vapor Space Height (ft.)	11B. Average Vapor Space Height (ft.)
12. Nominal Capacity *(specify barrels or gallons).* This is also known as "working volume"	
13A. Maximum annual throughput (gal/yr) 76,650 gal/yr	13B. Maximum daily throughput (gal/day) 210 gal/day
14. Number of tank turnovers per year 73	15. Maximum tank fill rate (gal/min) 0.15 gal/min
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 Pressure Setting
☐ Thief Hatch Weighted ☐ Yes ☐ No

[1] Complete appropriate Air Pollution Control Device Sheet

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

Material Name	**Flashing Loss**		**Working/Breathing Loss**		**Total Emissions Loss**		**Estimation Method[1]**
	lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	
VOCs							

[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 Seams.

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

22. Shell Condition (if metal and unlined):

☒ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

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

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

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

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:			
30. Daily Avg. Ambient Temperature (°F):		31. Annual Avg. Maximum Temperature (°F):	
32. Annual Avg. Minimum Temperature (°F):		33. Avg. Wind Speed (mph):	
34. Annual Avg. Solar Insulation Factor (BTU/ft^2-day):		35. Atmospheric Pressure (psia):	
LIQUID INFORMATION			
36. Avg. daily temperature range of bulk liquid (°F):	36A. Minimum (°F):	36B. Maximum (°F):	
37. Avg. operating pressure range of tank (psig):	37A. Minimum (psig):	37B. Maximum (psig):	
38A. Minimum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39A. Avg. liquid surface temperature (°F):		39B. Corresponding vapor pressure (psia):	
40A. Maximum liquid surface temperature (°F):		40B. Corresponding vapor pressure (psia):	
41. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary. SEE PROMAX MODEL IN CALCULATIONS			
41A. Material name and composition:			
41B. CAS number:			
41C. Liquid density (lb/gal):			
41D. Liquid molecular weight (lb/lb-mole):			
41E. Vapor molecular weight (lb/lb-mole):			
41F. Maximum true vapor pressure (psia):			
41G. Maximum Reid vapor pressure (psia):			
41H. Months Storage per year. From: To:			
42. Final maximum gauge pressure and temperature prior to transfer into tank used as inputs into flashing emission calculations.			

STORAGE TANK DATA TABLE

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

Source ID #[1]	Status[2]	Content[3]	Volume[4]
T02	Exist	Used Oil	2,150
T07	New	TEG	520
T08	New	Engine Oil	1,000

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.

global environmental solutions

Putnam B6 Compressor Station

Cranberry Pipeline Corporation

Glasgow District, West Virginia

Pressurized Separator Sampling and Emissions Estimation Report

SLR Ref: 116.00400.00064

August 2013

APPENDIX A

GPA METHOD 2286 LABORATORY RESULTS

Pressurized Separator Sampling and Emissions Estimation Report

Cranberry Pipeline Corporation
c/o Cabot Oil & Gas Corporation
900 Lee Street East
Suite 1500
Charleston, West Virginia 25301

August 2013

May 22, 2013

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

For: SLR International Corporation
900 Lee Street, Suite 200
Charleston, West Virginia 25301

Sample: Cabot Oil & Gas - Puttman B6
Separator Hydrocarbon Liquid
Sampled @ 28 psig & 60 °F

Date Sampled: 04/25/13 Job Number: 33213.002

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2186-M

COMPONENT	MOL %	LIQ VOL %	WT %
Nitrogen	0.019	0.002	0.002
Carbon Dioxide	0.044	0.007	0.007
Methane	1.228	0.194	0.068
Ethane	1.343	0.335	0.139
Propane	1.724	0.443	0.262
Isobutane	0.292	0.089	0.058
n-Butane	1.395	0.410	0.279
2,2 Dimethylpropane	0.048	0.017	0.012
Isopentane	0.610	0.208	0.151
n-Pentane	0.932	0.315	0.231
2,2 Dimethylbutane	0.012	0.005	0.003
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.120	0.046	0.036
2 Methylpentane	0.457	0.177	0.136
3 Methylpentane	0.283	0.108	0.084
n-Hexane	0.940	0.360	0.279
Heptanes Plus	90.554	97.285	98.254
Totals:	100.000	100.000	100.000

Characteristics of Heptanes Plus:

Specific Gravity	0.8672	(Water=1)
°API Gravity	31.66	@ 60°F
Molecular Weight	315.3	
Vapor Volume	8.73	CF/Gal
Weight	7.23	Lbs/Gal

Characteristics of Total Sample:

Specific Gravity	0.8587	(Water=1)
°API Gravity	33.29	@ 60°F
Molecular Weight	290.6	
Vapor Volume	9.38	CF/Gal
Weight	7.15	Lbs/Gal

Base Conditions: 14.650 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: JCM
Processor: Aldjv
Cylinder ID: W-1109

David Dannhaus 361-661-7015

TOTAL EXTENDED REPORT

COMPONENT	Mol %	LiqVol %	Wt %
Nitrogen	0.019	0.002	0.002
Carbon Dioxide	0.044	0.007	0.007
Methane	1.228	0.194	0.068
Ethane	1.343	0.335	0.139
Propane	1.724	0.443	0.262
Isobutane	0.292	0.089	0.058
n-Butane	1.395	0.410	0.279
2,2 Dimethylpropane	0.048	0.017	0.012
Isopentane	0.610	0.208	0.151
n-Pentane	0.932	0.315	0.231
2,2 Dimethylbutane	0.012	0.005	0.003
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.120	0.046	0.036
2 Methylpentane	0.457	0.177	0.136
3 Methylpentane	0.283	0.108	0.084
n-Hexane	0.940	0.360	0.279
Methylcyclopentane	0.528	0.174	0.153
Benzene	0.054	0.014	0.015
Cyclohexane	0.519	0.165	0.150
2-Methylhexane	0.418	0.181	0.144
3-Methylhexane	0.379	0.162	0.131
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C-7's	0.550	0.226	0.188
n-Heptane	1.093	0.470	0.377
Methylcyclohexane	1.528	0.573	0.516
Toluene	0.251	0.079	0.080
Other C-8's	2.887	1.279	1.095
n-Octane	1.425	0.681	0.560
E-Benzene	0.220	0.079	0.080
M & P Xylenes	0.586	0.212	0.214
O-Xylene	0.471	0.167	0.172
Other C-9's	2.953	1.461	1.283
n-Nonane	1.635	0.858	0.722
Other C-10's	4.741	2.578	2.305
n-decane	1.254	0.718	0.614
Undecanes(11)	5.356	2.989	2.710
Dodecanes(12)	5.045	3.041	2.795
Tridecanes(13)	4.918	3.178	2.962
Tetradecanes(14)	4.334	3.000	2.834
Pentadecanes(15)	3.784	2.806	2.682
Hexadecanes(16)	3.075	2.437	2.350
Heptadecanes(17)	2.764	2.316	2.254
Octadecanes(18)	2.683	2.367	2.317
Nonadecanes(19)	2.474	2.274	2.239
Eicosanes(20)	2.166	2.069	2.050
Heneicosanes(21)	1.881	1.891	1.884
Docosanes(22)	1.954	2.047	2.051
Tricosanes(23)	1.593	1.729	1.743
Tetracosanes(24)	1.905	2.143	2.170
Pentacosanes(25)	1.406	1.641	1.669
Hexacosanes(26)	1.487	1.799	1.838
Heptacosanes(27)	1.631	2.046	2.099
Octacosanes(28)	1.481	1.920	1.977
Nonacosanes(29)	1.181	1.581	1.634
Triacontanes(30)	1.004	1.386	1.437
Hentriacontanes Plus(31+)	16.940	42.546	45.761
Total	100.000	100.000	100.000

Cabot Oil & Gas - Poca Coal No. 6 Condensate Tank -T-001.

Component	Carbon Numer	*Results (Mol%)*	Inputs to E&P Tanks
CO2		0.0440	**0.0440**
O2		0.0000	**0.0000**
H2S		0.0000	**0.0000**
Nitrogen		0.0190	**0.0190**
Methane	C1	1.2280	**1.2280**
Ethane	C2	1.3430	**1.3430**
Propane	C3	1.7240	**1.7240**
iso-Butane	C4H10	0.2920	**0.2920**
n-Butane	C4H10	1.3950	**1.3950**
Iso-Pentane	C5H12	0.6100	**0.6100**
n-Pentane	C5H12	0.9320	**0.9320**
n-Hexane	C6H14	**0.9400**	**0.9400**
Cyclohexane	C6H12	0.5190	**1.9190**
Hexanes	C6H14	**1.4000**	
Heptanes	C7H16	2.4400	**3.9680**
Methylcyclohexane	C7H14	1.5280	
2,2,4- Trimethylpentane	C8H18	0.0000	**0.0000**
Benzene	C6H6	**0.0540**	**0.0540**
Toluene	C7H8	**0.2510**	**0.2510**
Ethylbenzene	C8H10	**0.2200**	**0.2200**
Xylenes (listed below)	C8H10	**1.0570**	**1.0570**
m/p- Xylene	C8H10	0.5860	
o- Xylene	C8H10	0.4710	
C8 Heavies (listed below)		4.3120	**4.3120**
Octanes	C8H18	1.4250	
Other C-8's	C8	2.8870	
C9 Heavies (listed below)		4.5880	**4.5880**
Nonanes		1.6350	
Other C-9's	C9	2.9530	
Sum Total (C1 through C9)		24.8960	
All Other components	C+10	75.1040	75.1040
	TOTAL	100.0000	100.0000

Hexanes	Liq. Vol/ %
2, 2 Dimethylbutane	**0.012**
2, 3 Dimethylbutane	**0.12**
2 Methylpentane	**0.457**
3 Methylpentane	**0.283**
Methylcyclopentane	**0.528**

Heptanes	Liq. Vol/ %
2-methylhexane	0.418
3-methylhexane	0.379
n-Heptane	1.093
Other C-7's	0.55

APPENDIX C

E&P TANKS VERSION 3.0 EMISSION ESTIMATE

Pressurized Separator Sampling and Emissions Estimation Report

Cranberry Pipeline Corporation
c/o Cabot Oil & Gas Corporation
900 Lee Street East
Suite 1500
Charleston, West Virginia 25301

August 2013

```
*********************************************************************************
******
*     Project Setup Information
    *
*********************************************************************************
******
Project File              : N:\West Virginia\Cabot\Projects\2013\Testing
Sampling\Tank Sampling\April 2013\Poca Coal No. 6  4-25-13 - Tanks Sampling\APPENDIX
C - Poca Coal 6.ept
Flowsheet Selection       : Oil Tank with Separator
Calculation Method        : AP42
Control Efficiency        : 100.0%
Known Separator Stream    : Low Pressure Oil
Entering Air Composition  : No

Date                      : 2013.07.23


*********************************************************************************
******
*     Data Input
    *
*********************************************************************************
******

Separator Pressure        : 28.00[psig]
Separator Temperature     : 60.00[F]
Ambient Pressure          : 14.70[psia]
Ambient Temperature       : 70.00[F]
C10+ SG                   : 0.8672
C10+ MW                   : 315.30

-- Low Pressure Oil
-------------------------------------------------------------------------
   No.    Component             mol %
   1      H2S                    0.0000
   2      O2                     0.0000
   3      CO2                    0.0440
   4      N2                     0.0190
   5      C1                     1.2280
   6      C2                     1.3430
   7      C3                     1.7240
   8      i-C4                   0.2920
   9      n-C4                   1.3950
   10     i-C5                   0.6100
   11     n-C5                   0.9800
   12     C6                     1.9190
   13     C7                     3.9680
   14     C8                     4.3120
   15     C9                     4.5880
   16     C10+                  75.0560
   17     Benzene                0.0540
   18     Toluene                0.2510
   19     E-Benzene              0.2200
   20     Xylenes                1.0570
   21     n-C6                   0.9400
   22     224Trimethylp          0.0000

-- Sales Oil
-------------------------------------------------------------------------
Production Rate           : 5[bbl/day]
Days of Annual Operation  : 365 [days/year]
```

API Gravity : 33.29
Reid Vapor Pressure : 7.70[psia]
Bulk Temperature : 60.00[F]

-- Tank and Shell Data

Diameter : 6.00[ft]
Shell Height : 11.50[ft]
Cone Roof Slope : 0.06
Average Liquid Height : 8.00[ft]
Vent Pressure Range : 0.06[psi]
Solar Absorbance : 0.17

-- Meteorological Data

City : Charleston, WV

Ambient Pressure : 14.70[psia]
Ambient Temperature : 70.00[F]
Min Ambient Temperature : 44.00[F]
Max Ambient Temperature : 65.50[F]
Total Solar Insolation : 1123.00[Btu/ft^2*day]

****
******
* Calculation Results
*
****
******

-- Emission Summary

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
Total HAPs	0.000	0.000
Total HC	0.717	0.164
VOCs, C2+	0.536	0.122
VOCs, C3+	0.316	0.072

Emission Factor lb VOC/bbl
(0.072 lb/hr)*(24hr/day)/(5bbl/day)=0.35 lbVOC/bbl

Uncontrolled Recovery Info.

Vapor	52.5300 x1E-3	[MSCFD]
HC Vapor	51.5000 x1E-3	[MSCFD]
GOR	10.51	[SCF/bbl]

-- Emission Composition

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]
1	H2S	0.000	0.000
2	O2	0.000	0.000
3	CO2	0.014	0.003
4	N2	0.005	0.001
5	C1	0.181	0.041
6	C2	0.220	0.050
7	C3	0.182	0.042
8	i-C4	0.018	0.004
9	n-C4	0.062	0.014
10	i-C5	0.013	0.003
11	n-C5	0.015	0.003
12	C6	0.009	0.002

13	C7	0.007	0.002
14	C8	0.003	0.001
15	C9	0.001	0.000
16	C10+	0.000	0.000
17	Benzene	0.000	0.000
18	Toluene	0.000	0.000
19	E-Benzene	0.000	0.000
20	Xylenes	0.000	0.000
21	n-C6	0.004	0.001
22	224Trimethylp	0.000	0.000
	Total	0.734	0.168

-- Stream Data

No.	Component	MW	LP Oil	Flash Oil	Sale Oil	Flash Gas	W&S Gas Total Emissions
			mol %	mol %	mol %	mol %	mol %
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.0440	0.0187	0.0123	1.1961	1.3910
4	N2	28.01	0.0190	0.0014	0.0000	0.8212	0.0005
5	C1	16.04	1.2280	0.2362	0.0545	46.3174	29.1183
6	C2	30.07	1.3430	0.7543	0.5963	28.1077	36.5488
7	C3	44.10	1.7240	1.4153	1.3282	15.7583	22.1847
8	i-C4	58.12	0.2920	0.2727	0.2671	1.1707	1.6499
9	n-C4	58.12	1.3950	1.3365	1.3192	4.0547	5.6824
10	i-C5	72.15	0.6100	0.6084	0.6075	0.6818	0.9360
11	n-C5	72.15	0.9800	0.9835	0.9837	0.8200	1.1143
12	C6	86.16	1.9190	1.9517	1.9589	0.4339	0.5689
13	C7	100.20	3.9680	4.0488	4.0671	0.2966	0.3757
14	C8	114.23	4.3120	4.4046	4.4258	0.1008	0.1231

15	C9	128.28	4.5880	4.6881	4.7110	0.0367	0.0433
16	C10+	315.30	75.0560	76.7069	77.0841	0.0000	0.0000
17	Benzene	78.11	0.0540	0.0550	0.0552	0.0091	0.0119
18	Toluene	92.13	0.2510	0.2563	0.2575	0.0118	0.0149
19	E-Benzene	106.17	0.2200	0.2248	0.2259	0.0034	0.0041
20	Xylenes	106.17	1.0570	1.0799	1.0852	0.0141	0.0170
21	n-C6	86.18	0.9400	0.9570	0.9608	0.1658	0.2153
22	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000

0.0000						
MW		258.27	263.32	263.94	28.70	33.06
29.10						
Stream Mole Ratio		1.0000	0.9785	0.9763	0.0215	0.0022
0.0237						
Heating Value	[BTU/SCF]				1647.41	1890.56
1670.06						
Gas Gravity	[Gas/Air]				0.99	1.14
1.00						
Bubble Pt. @ 100F	[psia]	57.57	18.33	10.94		
RVP @ 100F	[psia]	65.45	37.28	30.77		
Spec. Gravity @ 100F		0.721	0.722	0.722		

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

Identification

User Identification:	Staten Run - T02 - Used Oil
City:	Montgomery
State:	West Virginia
Company:	Nytis Exploration
Type of Tank:	Vertical Fixed Roof Tank
Description:	Staten Run Compressor Station

Tank Dimensions

Shell Height (ft):	5.00
Diameter (ft):	8.50
Liquid Height (ft) :	5.00
Avg. Liquid Height (ft):	3.00
Volume (gallons):	2,150.00
Turnovers:	5.00
Net Throughput(gal/yr):	10,750.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	8.50

Breather Vent Settings

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

Meterological Data used in Emissions Calculations: Charleston, West Virginia (Avg Atmospheric Pressure = 14.25 psia)

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

Staten Run - T02 - Used Oil - Vertical Fixed Roof Tank
Montgomery, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	56.67	51.31	62.04	55.00	0.0058	0.0048	0.0070	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

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

Staten Run - T02 - Used Oil - Vertical Fixed Roof Tank
Montgomery, West Virginia

Annual Emission Calcaulations	
Standing Losses (lb):	0.2666
Vapor Space Volume (cu ft):	142.3861
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0375
Vented Vapor Saturation Factor:	0.9992
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	142.3861
Tank Diameter (ft):	8.5000
Vapor Space Outage (ft):	2.5092
Tank Shell Height (ft):	5.0000
Average Liquid Height (ft):	3.0000
Roof Outage (ft):	0.5092
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5092
Dome Radius (ft):	8.5000
Shell Radius (ft):	4.2500
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Daily Avg. Liquid Surface Temp. (deg. R):	516.3441
Daily Average Ambient Temp. (deg. F):	54.9833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	514.6733
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,250.5726
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0375
Daily Vapor Temperature Range (deg. R):	21.4567
Daily Vapor Pressure Range (psia):	0.0022
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0070
Daily Avg. Liquid Surface Temp. (deg R):	516.3441
Daily Min. Liquid Surface Temp. (deg R):	510.9799
Daily Max. Liquid Surface Temp. (deg R):	521.7082
Daily Ambient Temp. Range (deg. R):	21.5333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9992
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	0.0058
Vapor Space Outage (ft):	2.5092
Working Losses (lb):	0.1941
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Annual Net Throughput (gal/yr.):	10,750.0000
Annual Turnovers:	5.0000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	2,150.0000
Maximum Liquid Height (ft):	5.0000
Tank Diameter (ft):	8.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.4607

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

Emissions Report for: Annual

Staten Run - T02 - Used Oil - Vertical Fixed Roof Tank
Montgomery, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.19	0.27	0.46

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

Identification

User Identification:	Staten Run - T07 - TEG
City:	Montgomery
State:	West Virginia
Company:	Nytis Exploration
Type of Tank:	Horizontal Tank
Description:	Staten Run Compressor Station

Tank Dimensions

Shell Length (ft):	5.50
Diameter (ft):	4.00
Volume (gallons):	520.00
Turnovers:	0.00
Net Throughput(gal/yr):	2,600.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good

Breather Vent Settings

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

Meterological Data used in Emissions Calculations: Charleston, West Virginia (Avg Atmospheric Pressure = 14.25 psia)

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

Staten Run - T07 - TEG - Horizontal Tank
Montgomery, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Propylene glycol	All	63.43	53.60	73.25	58.06	0.0011	0.0007	0.0019	76.1100			76.11	Option 2: A=8.2082, B=2085.9, C=203.54

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

Staten Run - T07 - TEG - Horizontal Tank
Montgomery, West Virginia

Annual Emission Calcaulations	
Standing Losses (lb):	0.0176
Vapor Space Volume (cu ft):	44.0223
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0710
Vented Vapor Saturation Factor:	0.9999
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	44.0223
Tank Diameter (ft):	4.0000
Effective Diameter (ft):	5.2939
Vapor Space Outage (ft):	2.0000
Tank Shell Length (ft):	5.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011
Daily Avg. Liquid Surface Temp. (deg. R):	523.0962
Daily Average Ambient Temp. (deg. F):	54.9833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	517.7333
Tank Paint Solar Absorptance (Shell):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,250.5726
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0710
Daily Vapor Temperature Range (deg. R):	39.3149
Daily Vapor Pressure Range (psia):	0.0013
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0007
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0019
Daily Avg. Liquid Surface Temp. (deg R):	523.0962
Daily Min. Liquid Surface Temp. (deg R):	513.2675
Daily Max. Liquid Surface Temp. (deg R):	532.9249
Daily Ambient Temp. Range (deg. R):	21.5333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9999
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	0.0011
Vapor Space Outage (ft):	2.0000
Working Losses (lb):	0.0054
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011
Annual Net Throughput (gal/yr.):	2,600.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	4.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0230

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

Emissions Report for: Annual

Staten Run - T07 - TEG - Horizontal Tank
Montgomery, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Propylene glycol	0.01	0.02	0.02

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

Identification

User Identification:	Staten Run - T08 - Engine Oil
City:	Montgomery
State:	West Virginia
Company:	Nytis Exploration
Type of Tank:	Horizontal Tank
Description:	Staten Run Compressor Station

Tank Dimensions

Shell Length (ft):	10.00
Diameter (ft):	4.25
Volume (gallons):	1,000.00
Turnovers:	0.00
Net Throughput(gal/yr):	5,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Red/Primer
Shell Condition	Good

Breather Vent Settings

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

Meterological Data used in Emissions Calculations: Charleston, West Virginia (Avg Atmospheric Pressure = 14.25 psia)

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

Staten Run - T08 - Engine Oil - Horizontal Tank
Montgomery, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	66.21	54.54	77.87	59.32	0.0081	0.0054	0.0114	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

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

Staten Run - T08 - Engine Oil - Horizontal Tank
Montgomery, West Virginia

Annual Emission Calcaulations	
Standing Losses (lb):	0.5192
Vapor Space Volume (cu ft):	90.3583
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0849
Vented Vapor Saturation Factor:	0.9991
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	90.3583
Tank Diameter (ft):	4.2500
Effective Diameter (ft):	7.3580
Vapor Space Outage (ft):	2.1250
Tank Shell Length (ft):	10.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0081
Daily Avg. Liquid Surface Temp. (deg. R):	525.8765
Daily Average Ambient Temp. (deg. F):	54.9833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9933
Tank Paint Solar Absorptance (Shell):	0.8900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,250.5726
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0849
Daily Vapor Temperature Range (deg. R):	46.6683
Daily Vapor Pressure Range (psia):	0.0060
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0081
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0054
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0114
Daily Avg. Liquid Surface Temp. (deg R):	525.8765
Daily Min. Liquid Surface Temp. (deg R):	514.2094
Daily Max. Liquid Surface Temp. (deg R):	537.5436
Daily Ambient Temp. Range (deg. R):	21.5333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9991
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	0.0081
Vapor Space Outage (ft):	2.1250
Working Losses (lb):	0.1246
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0081
Annual Net Throughput (gal/yr.):	5,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	4.2500
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.6438

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

Emissions Report for: Annual

Staten Run - T08 - Engine Oil - Horizontal Tank
Montgomery, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.12	0.52	0.64

ATTACHMENT L - TANKER TRUCK 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. Use extra pages if necessary.

Truck Loadout Collection Efficiencies

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

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

Compliance with this requirement shall be demonstrated by keeping records of the applicable MACT or NSPS Annual Leak Test certification for ***every*** truck and railcar loaded/unloaded. This requirement can be satisfied if the trucking company provided certification that its entire fleet was compliant. This certification must be submitted in writing to the Director of the DAQ. These additional requirements must be noted in the Registration Application and will be noted on the issued G35-C Registration.

Emission Unit ID#: TL-1	Emission Point ID#: TL-1	Year Installed/Modified: 1983
Emission Unit Description: Emissions from Truck Loading are vented to Atmosphere		
Loading Area Data		
Number of Pumps: 1 / On Truck	Number of Liquids Loaded: 1	Max number of trucks loading at one (1) time: 1
Are tanker trucks pressure tested for leaks at this or any other location? ☐ Yes ☐ No ☒ Not Required If Yes, Please describe:		
Provide description of closed vent system and any bypasses.		
Are any of the following truck loadout systems utilized? ☐ Closed System to tanker truck passing a MACT level annual leak test? ☐ Closed System to tanker truck passing a NSPS level annual leak test? ☐ Closed System to tanker truck not passing an annual leak test and has vapor return?		

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

Time	Jan – Mar	Apr - Jun	Jul – Sept	Oct - Dec
Hours/day	24	24	24	24
Days/week	7	7	7	7

Bulk Liquid Data (use extra pages as necessary)

Liquid Name	Pipeline Liquids		
Max. Daily Throughput (1000 gal/day)	0.63		
Max. Annual Throughput (1000 gal/yr)	229.95		
Loading Method[1]	SUB		
Max. Fill Rate (gal/min)	0.44		
Average Fill Time (min/loading)	60		
Max. Bulk Liquid Temperature (^{o}F)	65		
True Vapor Pressure[2]	7.70		

Cargo Vessel Condition[3]		C		
Control Equipment or Method[4]		None		
Max. Collection Efficiency (%)		0		
Max. Control Efficiency (%)		0		
Max.VOC Emission Rate	Loading (lb/hr)	0.10		
	Annual (ton/yr)	0.42		
Max.HAP Emission Rate	Loading (lb/hr)	0.00		
	Annual (ton/yr)	0.00		
Estimation Method[5]		EPA		

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 M

AIR POLLUTION CONTROL DEVICE SHEET(S)

NOT APPLICABLE (SEE NOTES)

No change to APCD associated with this permit modification

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

ATTACHMENT N

SUPPORTING EMISSIONS CALCULATIONS

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

Table 1. Annual Potential To Emit (PTE) Summary
Nytis Exploration Company - Staten Run Compressor Station

Criteria Pollutants

Current WV NSR Permit (R13-2863A) Allowables - Criteria Pollutants

Source	PM	PM10	PM2.5	SO2	NOx	CO	VOC	CO2e
Engine (ton/yr)	0.177	0.177	0.177	0.002	6.11	1.89	0.437	--
Reboiler (ton/yr)	0.024	0.024	0.024	0.002	0.33	0.28	0.02	--
Dehy Unit (ton/yr)	--	--	--	--	--	--	1.260	--
Fugitives (ton/yr)	--	--	--	--	--	--	0.317	6.999
Total Emissions (ton/yr)	0.201	0.201	0.201	0.004	6.437	2.168	2.032	6.999
Total Emissions (lb/hr)	0.046	0.046	0.046	0.001	1.470	0.495	0.464	1.598

Hazardous Air Pollutants (HAPs)

Current WV NSR Permit (R13-2863A) Allowables - HAPs

Source		Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Formaldehyde	Total HAPs
Engine (ton/yr)	--	0.007	0.004	0.000	0.001	0.002	0.33	0.422
Reboiler (ton/yr)	--	0.000	0.000	--	--	0.006	0.000	0.006
Dehy Unit (ton/yr)	--	0.110	0.080	0.010	0.100	0.070	--	0.370
Fugitives (ton/yr)	--	0.000	0.000	0.000	0.000	0.006	--	0.006
Total Emissions (ton/yr)	--	0.117	0.084	0.010	0.101	0.083	0.333	0.804
Total Emissions (lb/hr)	--	0.027	0.019	0.002	0.023	0.019	0.076	0.184

Criteria Pollutants

Proposed Increase in Emissions - Criteria Pollutants

Source	PM	PM10	PM2.5	SO2	NOx	CO	VOC	CO2e
Total Emissions (ton/yr)	0.042	0.042	0.042	--	--	--	2.081	984.319
Total Emissions (lb/hr)	0.010	0.010	0.010	--	--	--	0.475	224.730

Hazardous Air Pollutants (HAPs)

Proposed Increase in Emissions - HAPs

Source		Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Formaldehyde	Total HAPs
Total Emissions (ton/yr)	--	--	--	--	--	--	--	0.022
Total Emissions (lb/hr)	--	--	--	--	--	--	--	0.005

Criteria Pollutants

Proposed R13 Permit Modification Allowables - Criteria Pollutants

Source	PM	PM10	PM2.5	SO2	NOx	CO	VOC	CO2e
Engine (ton/yr)	0.219	0.219	0.219	0.003	6.107	1.888	1.110	530.441
Reboiler (ton/yr)	0.024	0.024	0.024	0.002	0.330	0.280	0.020	384.378
Dehy Unit (ton/yr)	--	--	--	--	--	--	1.287	69.500
Tanks (ton/yr)	--	--	--	--	--	--	0.959	--
Truck Loading (ton/yr)	--	--	--	--	--	--	0.421	--
Fugitives (ton/yr)	--	--	--	--	--	--	0.317	6.999
Total Emissions (ton/yr)	0.243	0.243	0.243	0.005	6.437	2.168	4.113	991.317
Total Emissions (lb/hr)	0.056	0.056	0.056	0.001	1.470	0.495	0.939	226.328

Hazardous Air Pollutants (HAPs)

Proposed R13 Permit Modification Allowables - HAPs **

Source		Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Formaldehyde	Total HAPs
Engine (ton/yr)	--	0.009	0.004	0.000	0.001	0.002	0.333	0.443
Reboiler (ton/yr)	--	0.000	0.000	--	--	0.006	0.000	0.006
Dehy Unit (ton/yr)	--	0.110	0.080	0.010	0.100	0.070	--	0.370
Tanks (ton/yr)	--	--	--	--	--	--	--	--
Truck Loading (ton/yr)	--	--	--	--	--	--	--	--
Fugitives (ton/yr)	--	0.000	0.000	0.000	0.000	0.006	--	0.006
Total Emissions (ton/yr)	--	0.119	0.085	0.010	0.101	0.084	0.333	0.826
Total Emissions (lb/hr)	--	0.027	0.019	0.002	0.023	0.019	0.076	0.189

** Proposed HAP limits remain at previously permitted levels

Criteria Pollutants

Proposed Facility Wide PTE for Title V Applicability Status Determination - Criteria Pollutants

Source	PM	PM10	PM2.5	SO2	NOx	CO	VOC	CO2e
Engine (ton/yr)	1.172	1.172	1.172	0.024	179.940	11.690	11.727	5078.032
Reboiler (ton/yr)	0.024	0.024	0.024	0.002	0.330	0.280	0.020	384.378
Dehy Unit (ton/yr)	--	--	--	--	--	--	1.287	69.500
Tanks (ton/yr)	--	--	--	--	--	--	0.959	--
Truck Loading (ton/yr)	--	--	--	--	--	--	0.421	--
Fugitives (ton/yr)	--	--	--	--	--	--	0.317	6.999
Total Emissions (ton/yr)	1.196	1.196	1.196	0.026	180.270	11.970	14.730	5538.909
Total Emissions (lb/hr)	0.273	0.273	0.273	0.006	41.158	2.733	3.363	1264.591

Hazardous Air Pollutants (HAPs)

Proposed Facility Wide PTE for Title V Applicability Status Determination - HAPs

Source		Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Formaldehyde	Total HAPs
Engine (ton/yr)	--	0.069	0.028	0.002	0.009	0.006	1.377	2.023
Reboiler (ton/yr)	--	0.000	0.000	--	--	0.006	0.000	0.006
Dehy Unit (ton/yr)	--	0.110	0.080	0.010	0.100	0.070	--	0.370
Tanks (ton/yr)	--	--	--	--	--	--	--	--
Truck Loading (ton/yr)	--	--	--	--	--	--	--	--
Fugitives (ton/yr)	--	0.000	0.000	0.000	0.000	0.006	--	0.006
Total Emissions (ton/yr)	--	0.110	0.080	0.010	0.100	0.082	0.000	0.382
Total Emissions (lb/hr)	--	0.025	0.018	0.002	0.023	0.019	0.000	0.087

Table 2. Reciprocating Engine / Compressor Emissions (#1)
Caterpillar G398-SI; 4SRB (Grandfathered Unit - 1985)
Nytis Exploration Company - Staten Run Compressor Station

Pollutant	Emission Factor			PTE per Engine (lb/hr)	PTE per Engine (tons/yr)
Criteria Pollutants					
PM/PM10/PM2.5**	1.94E-02	lb/MMBtu	(1)	0.060	0.261
SO_2	5.88E-04	lb/MMBtu	(1)	0.002	0.008
NOx	1.83E+01	g/hp-hr	(2)	16.622	72.803
CO	8.00E-01	g/hp-hr	(2)	0.727	3.183
VOC	1.20E+00	g/hp-hr	(2)	1.090	4.774
Hazardous Air Pollutants					
1,1,2,2-Tetrachloroethane	2.53E-05	lb/MMBtu	(1)	0.000	0.000
1,1,2-Trichloroethane	1.53E-05	lb/MMBtu	(1)	0.000	0.000
1,3-Butadiene	6.63E-04	lb/MMBtu	(1)	0.002	0.009
1,3-Dichloropropene	1.27E-05	lb/MMBtu	(1)	0.000	0.000
Acetaldehyde	2.73E-03	lb/MMBtu	(1)	0.008	0.037
Acrolein	2.63E-03	lb/MMBtu	(1)	0.008	0.035
Benzene	1.58E-03	lb/MMBtu	(1)	0.005	0.021
Carbon Tetrachloride	1.77E-05	lb/MMBtu	(1)	0.000	0.000
Chlorobenzene	1.29E-05	lb/MMBtu	(1)	0.000	0.000
Chloroform	1.37E-05	lb/MMBtu	(1)	0.000	0.000
Ethylbenzene	2.48E-05	lb/MMBtu	(1)	0.000	0.000
Ethylene Dibromide	2.13E-05	lb/MMBtu	(1)	0.000	0.000
Formaldehyde	2.05E-02	lb/MMBtu	(2)	0.063	0.276
Methanol	3.06E-03	lb/MMBtu	(1)	0.009	0.041
Methylene Chloride	4.12E-05	lb/MMBtu	(1)	0.000	0.001
Naphthalene	9.71E-05	lb/MMBtu	(1)	0.000	0.001
PAH (POM)	1.41E-04	lb/MMBtu	(1)	0.000	0.002
Styrene	1.19E-05	lb/MMBtu	(1)	0.000	0.000
Toluene	5.58E-04	lb/MMBtu	(1)	0.002	0.008
Vinyl Chloride	7.18E-06	lb/MMBtu	(1)	0.000	0.000
Xylenes	1.95E-04	lb/MMBtu	(1)	0.001	0.003
Total HAP				**0.099**	**0.436**
Greenhouse Gas Emissions					
CO_2	116.89	lb/MMBtu	(3)	359.26	1573.56
CH_4	2.2E-03	lb/MMBtu	(3)	0.01	0.03
N_2O	2.2E-04	lb/MMBtu	(3)	0.00	0.00
$CO_2e^{(b)}$	-	-		359.63	1575.19

** PM Emission Factor includes condesables and filterables

Hourly Emissions - If emission factor note 1 or 3 is used, use calculation (a). If emission factor note 2 is used, use calculation (b).

(a) Hourly Emissions (lb/hr) = Emission factor (lb/MMBtu) * (1MMBtu/1000000 Btu) * Engine Power Output (hp) * BSFC (Btu/hp-hr)

(b) Hourly Emissions (lb/hr) = Emission factor (g/hp-hr) * Engine Power Output (hp) * (lb/453.6g)

Annual Emissions - If emission factor note 1 or 3 is used, use calculation (c). If emission factor note 2 is used, use calculation (d).

(c) Annual emissions (tons/yr) = Emission factor (lb/MMBtu) * (1MMBtu/1000000Btu) * Engine Power Output (hp) * BSFC (Btu/hp-hr) * Annual Hours of operation (hr/yr) * (1ton/2000lbs)

(d) Annual emissions (tons/yr) = Emission factor (g/hp-hr) * Engine Power Output (hp) * Annual Hours of operation (hr/yr) * (1ton/2000lbs) * (lb/453.6g)

EMISSON INPUTS TABLE		
Engine Power Output (kW) =	307	
Engine Power Output (hp) =	412	
Average BSFC (BTU/HP-hr) =	7,460	(4)
Heat Content Natural Gas(Btu/scf) =	1,020.0	(5)
Fuel Throughput (ft3/hr) =	3,013.3	(6)
PTE Hours of Operation =	8,760	

(b) CO_2 equivalent = [(CO_2 emissions)*(GWP_{CO2})]+[(CH_4 emissions)*(GWP_{CH4})]+[(N_2O emissions)*(GWP_{N2O})]
Global Warming Potential (GWP)

CO_2	1	(7)
CH_4	25	(7)
N_2O	298	(7)

Notes:

(1) AP-42, Chapter 3.2, Table 3.2-3. Natural Gas-fired Reciprocating Engines (7/00). Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines.

(2) Manufacturers Spec Sheet

(3) Emission factors are from 40 CFR 98, Subpart C, Table C-1 and C-2.

(4) Fuel consumption from manufacturer's specification sheet.

(5) Value obtained from AP-42, section 3.2

(6) Fuel throughput = BSFC (BTU/HP-hr) x Power (HP) / Heat Content (BTU/scf)

(7) Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

Table 3. Reciprocating Engine / Compressor Emissions (#2)
Caterpillar G398-SI; 4SRB (Grandfathered Unit - 1985)
Nytis Exploration Company - Staten Run Compressor Station

Pollutant	Emission Factor			PTE per Engine (lb/hr)	PTE per Engine (tons/yr)
Criteria Pollutants					
PM/PM10/PM2.5**	1.94E-02	lb/MMBtu	(1)	0.060	0.261
SO_2	5.88E-04	lb/MMBtu	(1)	0.002	0.008
NOx	1.83E+01	g/hp-hr	(2)	16.622	72.803
CO	8.00E-01	g/hp-hr	(2)	0.727	3.183
VOC	1.20E+00	g/hp-hr	(2)	1.090	4.774
Hazardous Air Pollutants					
1,1,2,2-Tetrachloroethane	2.53E-05	lb/MMBtu	(1)	0.000	0.000
1,1,2-Trichloroethane	1.53E-05	lb/MMBtu	(1)	0.000	0.000
1,3-Butadiene	6.63E-04	lb/MMBtu	(1)	0.002	0.009
1,3-Dichloropropene	1.27E-05	lb/MMBtu	(1)	0.000	0.000
Acetaldehyde	2.73E-03	lb/MMBtu	(1)	0.008	0.037
Acrolein	2.63E-03	lb/MMBtu	(1)	0.008	0.035
Benzene	1.58E-03	lb/MMBtu	(1)	0.005	0.021
Carbon Tetrachloride	1.77E-05	lb/MMBtu	(1)	0.000	0.000
Chlorobenzene	1.29E-05	lb/MMBtu	(1)	0.000	0.000
Chloroform	1.37E-05	lb/MMBtu	(1)	0.000	0.000
Ethylbenzene	2.48E-05	lb/MMBtu	(1)	0.000	0.000
Ethylene Dibromide	2.13E-05	lb/MMBtu	(1)	0.000	0.000
Formaldehyde	2.05E-02	lb/MMBtu	(2)	0.063	0.276
Methanol	3.06E-03	lb/MMBtu	(1)	0.009	0.041
Methylene Chloride	4.12E-05	lb/MMBtu	(1)	0.000	0.001
Naphthalene	9.71E-05	lb/MMBtu	(1)	0.000	0.001
PAH (POM)	1.41E-04	lb/MMBtu	(1)	0.000	0.002
Styrene	1.19E-05	lb/MMBtu	(1)	0.000	0.000
Toluene	5.58E-04	lb/MMBtu	(1)	0.002	0.008
Vinyl Chloride	7.18E-06	lb/MMBtu	(1)	0.000	0.000
Xylenes	1.95E-04	lb/MMBtu	(1)	0.001	0.003
Total HAP				**0.099**	**0.436**
Greenhouse Gas Emissions					
CO_2	116.89	lb/MMBtu	(3)	359.26	1573.56
CH_4	2.2E-03	lb/MMBtu	(3)	0.01	0.03
N_2O	2.2E-04	lb/MMBtu	(3)	0.00	0.00
$CO_2e^{(b)}$	-	-		359.63	1575.19

** PM Emission Factor includes condesables and filterables

Hourly Emissions - If emission factor note 1 or 3 is used, use calculation (a). If emission factor note 2 is used, use calculation (b).

(a) Hourly Emissions (lb/hr) = Emission factor (lb/MMBtu) * (1MMBtu/1000000 Btu) * Engine Power Output (hp) * BSFC (Btu/hp-hr)

(b) Hourly Emissions (lb/hr) = Emission factor (g/hp-hr) * Engine Power Output (hp) * (lb/453.6g)

Annual Emissions - If emission factor note 1 or 3 is used, use calculation (c). If emission factor note 2 is used, use calculation (d).

(c) Annual emissions (tons/yr) = Emission factor (lb/MMBtu) * (1MMBtu/1000000Btu) * Engine Power Output (hp) * BSFC (Btu/hp-hr) * Annual Hours of operation (hr/yr) * (1ton/2000lbs)

(d) Annual emissions (tons/yr) = Emission factor (g/hp-hr) * Engine Power Output (hp) * Annual Hours of operation (hr/yr) * (1ton/2000lbs) * (lb/453.6g)

EMISSON INPUTS TABLE		
Engine Power Output (kW) =	307	
Engine Power Output (hp) =	412	
Average BSFC (BTU/HP-hr) =	7,460	(4)
Heat Content Natural Gas(Btu/scf) =	1,020.0	(5)
Fuel Throughput (ft3/hr) =	3,013.3	(6)
PTE Hours of Operation =	8,760	

(b) CO_2 equivalent = [(CO_2 emissions)*(GWP_{CO2})]+[(CH_4 emissions)*(GWP_{CH4})]+[(N_2O emissions)*(GWP_{N2O})]
Global Warming Potential (GWP)

CO_2	1	(7)
CH_4	25	(7)
N_2O	298	(7)

Notes:

(1) AP-42, Chapter 3.2, Table 3.2-3. Natural Gas-fired Reciprocating Engines (7/00). Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines.

(2) Manufacturers Spec Sheet

(3) Emission factors are from 40 CFR 98, Subpart C, Table C-1 and C-2.

(4) Fuel consumption from manufacturer's specification sheet.

(5) Value obtained from AP-42, section 3.2

(6) Fuel throughput = BSFC (BTU/HP-hr) x Power (HP) / Heat Content (BTU/scf)

(7) Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

Table 4. Reciprocating Engine / Compressor Emissions (#3)
Cooper Bessemer GMX-A6; 2SLB (Grandfathered Unit - 1975)
Nytis Exploration Company - Staten Run Compressor Station

Pollutant	Emission Factor			PTE per Engine (lb/hr)	PTE per Engine (tons/yr)
Criteria Pollutants					
PM/PM10/PM2.5**	4.83E-02	lb/MMBtu	(2)	0.132	0.430
SO_2	5.88E-04	lb/MMBtu	(2)	0.002	0.005
NOx	3.17E+00	lb/MMBtu	(2)	8.642	28.227
CO	3.86E-01	lb/MMBtu	(2)	1.052	3.437
VOC	1.20E-01	lb/MMBtu	(2)	0.327	1.069
Hazardous Air Pollutants					
1,1,2,2-Tetrachloroethane	6.63E-05	lb/MMBtu	(2)	0.000	0.001
1,1,2-Trichloroethane	5.27E-05	lb/MMBtu	(2)	0.000	0.000
1,3-Butadiene	8.20E-04	lb/MMBtu	(2)	0.002	0.007
1,3-Dichloropropene	4.38E-05	lb/MMBtu	(2)	0.000	0.000
2-Methylnappthalene	2.14E-05	lb/MMBtu	(2)	0.000	0.000
2,2,4-Trimethylpentane	8.46E-04	lb/MMBtu	(2)	0.002	0.008
Acetaldehyde	7.76E-03	lb/MMBtu	(2)	0.021	0.069
Acrolein	7.78E-03	lb/MMBtu	(2)	0.021	0.069
Benzene	1.94E-03	lb/MMBtu	(2)	0.005	0.017
Biphenyl	3.95E-06	lb/MMBtu	(2)	0.000	0.000
Carbon Tetrachloride	6.07E-05	lb/MMBtu	(2)	0.000	0.001
Chlorobenzene	4.44E-05	lb/MMBtu	(2)	0.000	0.000
Chloroform	4.71E-05	lb/MMBtu	(2)	0.000	0.000
Ethylbenzene	1.08E-04	lb/MMBtu	(2)	0.000	0.001
Ethylene Dibromide	7.34E-05	lb/MMBtu	(2)	0.000	0.001
Formaldehyde	5.52E-02	lb/MMBtu	(2)	0.150	0.492
Methanol	2.48E-03	lb/MMBtu	(2)	0.007	0.022
Methylene Chloride	1.47E-04	lb/MMBtu	(2)	0.000	0.001
n-Hexane	4.45E-04	lb/MMBtu	(2)	0.001	0.004
Naphthalene	9.63E-05	lb/MMBtu	(2)	0.000	0.001
PAH (POM)	1.34E-04	lb/MMBtu	(2)	0.000	0.001
Phenol	4.21E-05	lb/MMBtu	(2)	0.000	0.000
Styrene	5.48E-05	lb/MMBtu	(2)	0.000	0.000
Toluene	9.63E-04	lb/MMBtu	(2)	0.003	0.009
Vinyl Chloride	2.47E-05	lb/MMBtu	(2)	0.000	0.000
Xylenes	2.68E-04	lb/MMBtu	(2)	0.001	0.002
Total HAP				**0.162**	**0.708**
Greenhouse Gas Emissions					
CO_2	116.89	lb/MMBtu	(3)	318.67	1395.77
CH_4	2.2E-03	lb/MMBtu	(3)	0.01	0.03
N_2O	2.2E-04	lb/MMBtu	(3)	0.00	0.00
CO_2e[(b)]	-	-		319.00	1397.21

** PM Emission Factor includes condesables and filterables

Hourly Emissions - If emission factor note 1 or 3 is used, use calculation (a). If emission factor note 2 is used, use calculation (b).

(a) Hourly Emissions (lb/hr) = Emission factor (lb/MMBtu) * (1MMBtu/1000000 Btu) * Engine Power Output (hp) * BSFC (Btu/hp-hr)

(b) Hourly Emissions (lb/hr) = Emission factor (g/hp-hr) * Engine Power Output (hp) * (lb/453.6g)

Annual Emissions - If emission factor note 1 or 3 is used, use calculation (c). If emission factor note 2 is used, use calculation (d).

(c) Annual emissions (tons/yr) = Emission factor (lb/MMBtu) * (1MMBtu/1000000Btu) * Engine Power Output (hp) * BSFC (Btu/hp-hr) * Annual Hours of operation (hr/yr) * (1ton/2000lbs)

(d) Annual emissions (tons/yr) = [Emission Factor (lbs/MMBtu)] x Brake Specific Fuel Consumption (BTU/HP-hr)] x Power Output (HP)] x [Number of engines] x [8760 (hrs/yr)] x [1 ton/2000 lbs)

EMISSION INPUTS TABLE		
Engine Power Output (kW) =	280	
Engine Power Output (hp) =	375	
Average BSFC (BTU/HP-hr) =	7,270	(4)
Heat Content Natural Gas(Btu/scf) =	1,020.0	(5)
Fuel Throughput (ft3/hr) =	2,672.8	(6)
PTE Hours of Operation =	8,760	

(b) CO_2 equivalent = [(CO_2 emissions)*(GWP_{CO2})]+[(CH_4 emissions)*(GWP_{CH4})]+[(N_2O emissions)*(GWP_{N2O})]
Global Warming Potential (GWP)

CO_2	1	(7)
CH_4	25	(7)
N_2O	298	(7)

Notes:

(1) Manufacturers Spec Sheet

(2) AP-42, Chapter 3.2, Table 3.2-1. *Natural Gas-fired Reciprocating Engines* (7/00). Uncontrolled Emission Factors for 2-Stroke Lean-Burn Engines.

(3) Emission factors are from 40 CFR 98, Subpart C, Table C-1 and C-2.

(4) Fuel consumption from manufacturer's specification sheet.

(5) Value obtained from AP-42, section 3.2

(6) Fuel throughput = BSFC (BTU/HP-hr) x Power (HP) / Heat Content (BTU/scf)

(7) Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

Table 5. Reciprocating Engine / Compressor Emissions (#4)
AJAX DPC 120 2SLB
Nytis Exploration Company - Staten Run Compressor Station

Pollutant	Emission Factor			PTE per Engine (lb/hr)	PTE per Engine (tons/yr)
Criteria Pollutants					
PM/PM10/PM2.5**	4.83E-02	lb/MMBtu	(1)	0.050	0.219
SO_2	5.88E-04	lb/MMBtu	(1)	0.001	0.003
NOx	5.50E+00	g/hp-hr	(2)	1.394	6.107
CO	1.70E+00	g/hp-hr	(2)	0.431	1.888
VOC	1.00E+00	g/hp-hr	(2)	0.254	1.110
Hazardous Air Pollutants					
1,1,2,2-Tetrachloroethane	6.63E-05	lb/MMBtu	(1)	0.000	0.000
1,1,2-Trichloroethane	5.27E-05	lb/MMBtu	(1)	0.000	0.000
1,3-Butadiene	8.20E-04	lb/MMBtu	(1)	0.001	0.004
1,3-Dichloropropene	4.38E-05	lb/MMBtu	(1)	0.000	0.000
2-Methylnappthalene	2.14E-05	lb/MMBtu	(1)	0.000	0.000
2,2,4-Trimethylpentane	8.46E-04	lb/MMBtu	(1)	0.001	0.004
Acetaldehyde	7.76E-03	lb/MMBtu	(1)	0.008	0.035
Acrolein	7.78E-03	lb/MMBtu	(1)	0.008	0.035
Benzene	1.94E-03	lb/MMBtu	(1)	0.002	0.009
Biphenyl	3.95E-06	lb/MMBtu	(1)	0.000	0.000
Carbon Tetrachloride	6.07E-05	lb/MMBtu	(1)	0.000	0.000
Chlorobenzene	4.44E-05	lb/MMBtu	(1)	0.000	0.000
Chloroform	4.71E-05	lb/MMBtu	(1)	0.000	0.000
Ethylbenzene	1.08E-04	lb/MMBtu	(1)	0.000	0.000
Ethylene Dibromide	7.34E-05	lb/MMBtu	(1)	0.000	0.000
Formaldehyde	3.00E-01	g/hp-hr	(2)	0.076	0.333
Methanol	2.48E-03	lb/MMBtu	(1)	0.003	0.011
Methylene Chloride	1.47E-04	lb/MMBtu	(1)	0.000	0.001
n-Hexane	4.45E-04	lb/MMBtu	(1)	0.000	0.002
Naphthalene	9.63E-05	lb/MMBtu	(1)	0.000	0.000
PAH (POM)	1.34E-04	lb/MMBtu	(1)	0.000	0.001
Phenol	4.21E-05	lb/MMBtu	(1)	0.000	0.000
Styrene	5.48E-05	lb/MMBtu	(1)	0.000	0.000
Toluene	9.63E-04	lb/MMBtu	(1)	0.001	0.004
Vinyl Chloride	2.47E-05	lb/MMBtu	(1)	0.000	0.000
Xylenes	2.68E-04	lb/MMBtu	(1)	0.000	0.001
Total HAP				**0.101**	**0.443**
Greenhouse Gas Emissions					
CO_2	116.89	lb/MMBtu	(3)	120.98	529.89
CH_4	2.2E-03	lb/MMBtu	(3)	0.00	0.01
N_2O	2.2E-04	lb/MMBtu	(3)	0.00	0.00
CO_2e[(b)]	-	-		121.11	530.44

** PM Emission Factor includes condesables and filterables

Hourly Emissions - If emission factor note 1 or 3 is used, use calculation (a). If emission factor note 2 is used, use calculation (b).

(a) Hourly Emissions (lb/hr) = Emission factor (lb/MMBtu) * (1MMBtu/1000000 Btu) * Engine Power Output (hp) * BSFC (Btu/hp-hr)

(b) Hourly Emissions (lb/hr) = Emission factor (g/hp-hr) * Engine Power Output (hp) * (lb/453.6g)

Annual Emissions - If emission factor note 1 or 3 is used, use calculation (c). If emission factor note 2 is used, use calculation (d).

(c) Annual emissions (tons/yr) = Emission factor (lb/MMBtu) * (1MMBtu/1000000Btu) * Engine Power Output (hp) * BSFC (Btu/hp-hr) * Annual Hours of operation (hr/yr) * (1ton/2000lbs)

(d) Annual emissions (tons/yr) = Emission factor (g/hp-hr) * Engine Power Output (hp) * Annual Hours of operation (hr/yr) * (1ton/2000lbs) * (lb/453.6g)

EMISSON INPUTS TABLE		
Engine Power Output (kW) =	86	
Engine Power Output (hp) =	115	
Average BSFC (BTU/HP-hr) =	9,000	(4)
Heat Content Natural Gas(Btu/scf) =	1,020.0	(5)
Fuel Throughput (ft3/hr) =	1,014.7	(6)
PTE Hours of Operation =	8,760	

(b) CO_2 equivalent = [(CO_2 emissions)*(GWP_{CO2})]+[(CH_4 emissions)*(GWP_{CH4})]+[(N_2O emissions)*(GWP_{N2O})]
Global Warming Potential (GWP)

CO_2	1	(7)
CH_4	25	(7)
N_2O	298	(7)

Notes:

(1) AP-42, Chapter 3.2, Table 3.2-1. Natural Gas-fired Reciprocating Engines (7/00). Uncontrolled Emission Factors for 2-Stroke Lean-Burn Engines.

(2) Manufacturers Spec Sheets

(3) Emission factors are from 40 CFR 98, Subpart C, Table C-1 and C-2.

(4) Fuel consumption from manufacturer's specification sheet.

(5) Value obtained from AP-42, section 3.2

(6) Fuel throughput = BSFC (BTU/HP-hr) x Power (HP) / Heat Content (BTU/scf)

(7) Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

Table 6. TEG Dehydration Unit Reboiler Emissions (RBV-1)
FLAMECO; Model # SB20-12
Nytis Exploration Company - Staten Run Compressor Station

Pollutant	Emission Factor			PTE per Burner (lb/hr)		PTE per Burner (ton/yr)	
Criteria Pollutants							
PM/PM10/PM2.5	7.6	lb/MMcf	(1)	0.006	(a)	0.024	(b)
SO_2	0.6	lb/MMcf	(1)	0.000	(e)	0.002	(f)
NOx	100	lb/MMcf	(2)	0.074	(a)	0.322	(b)
CO	84	lb/MMcf	(2)	0.062	(a)	0.271	(b)
VOC	5.5	lb/MMcf	(1)	0.004	(a)	0.018	(b)
Hazardous Air Pollutants							
Arsenic	2.00E-04	lb/MMcf	(3)	0.000	(a)	0.000	(b)
Benzene	2.10E-03	lb/MMcf	(4)	0.000	(a)	0.000	(b)
Beryllium	1.20E-05	lb/MMcf	(3)	0.000	(a)	0.000	(b)
Cadmium	1.10E-03	lb/MMcf	(3)	0.000	(a)	0.000	(b)
Chromium	1.40E-03	lb/MMcf	(3)	0.000	(a)	0.000	(b)
Cobalt	8.40E-05	lb/MMcf	(3)	0.000	(a)	0.000	(b)
Dichlorobenzene	1.20E-03	lb/MMcf	(4)	0.000	(a)	0.000	(b)
Formaldehyde	7.50E-02	lb/MMcf	(4)	0.000	(a)	0.000	(b)
Hexane	1.80E+00	lb/MMcf	(4)	0.001	(a)	0.006	(b)
Lead	5.00E-04	lb/MMcf	(3)	0.000	(a)	0.000	(b)
Manganese	3.80E-04	lb/MMcf	(3)	0.000	(a)	0.000	(b)
Mercury	2.60E-04	lb/MMcf	(3)	0.000	(a)	0.000	(b)
Naphthalene	6.10E-04	lb/MMcf	(4)	0.000	(a)	0.000	(b)
Nickel	2.10E-03	lb/MMcf	(3)	0.000	(a)	0.000	(b)
PAH/POM	1.29E-03	lb/MMcf	(4)	0.000	(a)	0.000	(b)
Selenium	2.40E-05	lb/MMcf	(3)	0.000	(a)	0.000	(b)
Toluene	3.40E-03	lb/MMcf	(4)	0.000	(a)	0.000	(b)
Total HAP				0.00		0.006	
Greenhouse Gas Emissions							
CO_2	116.89	lb/MMBtu	(6)	87.67	(c)	383.98	(d)
CH_4	2.2E-03	lb/MMBtu	(6)	0.00	(c)	0.01	(d)
N_2O	2.2E-04	lb/MMBtu	(6)	0.00	(c)	0.00	(d)
$CO_2e^{(g)}$	-	-		87.76		384.38	

Calculations:

LB/MMCF

(a) Hourly emissions (lb/hr) = Emission Factor (lb/MMcf) * Fuel Use (MMCF/yr) / Annual hours of operation (hr/yr)

(b) Annual emissions (ton/yr) = Emission Factor (lb/MMcf) * Fuel Use (MMcf/yr) * (1ton/2000lbs)

LB/MMBTU

(c) Hourly Emissions (lb/hr) = Emission Factor (lb/MMBtu) * Fuel Use (MMBtu/hr)

(d) Annual Emissions (ton/yr) = Emission Factor (lb/MMBtu) * Fuel Use (MMBtu/hr) * Hours of operation (hr/yr) * (1ton/2000lbs)

EMISSION INPUTS TABLE	
Fuel Use (MMBtu/hr) =	0.75
Number of Reboilers =	1
Hours of Operation (hr/yr) =	8760
MMBtu/MMcf =	1020
PTE Fuel Use (MMft3/yr) =	6.44

(g) CO_2 equivalent = [(CO_2 emissions)*(GWP_{CO2})]+[(CH_4 emissions)*(GWP_{CH4})]+[(N_2O emissions)*(GWP_{N2O})]

Global Warming Potential (GWP)

CO_2	1	(7)
CH_4	25	(7)
N_2O	298	(7)

Notes:

(1) AP-42, Chapter 1.4, Table 1.4-2. Emission Factors For Criteria Pollutants and Greenhouse Gases From Natural Gas Combustion, July 1998.

(2) AP-42, Chapter 1.4, Table 1.4-1. Emission Factors For Nitrogen Oxides (Nox) and Carbon Monoxide(CO) From Natural Gas Combustion, July 1998.

(3) AP-42, Chapter 1.4, Table 1.4-4. Emission Factors For Metals From Natural Gas Combustion, July 1998.

(4) AP-42, Chapter 1.4, Table 1.4-3. Emission Factors for Speciated Organic Compounds from Natural Gas Combustion, July 1998.

(5) AP-42, Chapter 5.3, Section 5.3.1

(6) Emission factors are from 40 CFR 98, Subpart C, Table C-1 and C-2.

(7) Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

Table 7. Dehydration Unit Still Column Emissions (RSV-1)
Sivalls; Model # UK
Nytis Exploration Company - Staten Run Compressor Station

Pollutant	PTE [(1)] (lbs/hr)	PTE [(1)] (lbs/day)	PTE [(1)] (tons/yr)	R13-2863A Allowables (ton/yr)	Proposed R13 Allowables (tons/yr)
Criteria Pollutants					
VOC	0.29	7.05	1.29	1.26	1.29
Hazardous Air Pollutants					
Benzene	0.01	0.30	0.05	0.11	0.11
Toluene	0.01	0.32	0.06	0.08	0.08
Ethylbenzene	0.00	0.01	0.00	0.01	0.01
Xylenes	0.01	0.13	0.02	0.10	0.10
n-Hexane	0.01	0.33	0.06	0.07	0.07
Total HAPs	**0.04**	**1.07**	**0.20**	**0.37**	**0.37**
Greenhouse Gas Emissions					
CO_2	--	--	--	--	--
CH_4	0.63	15.22	2.78	--	2.78
N_2O	--	--	--	--	--
CO_2e[(a)]	15.85	380.47	69.44	--	69.50

Calculations:

GLYCALC 4.0 EMISSION ESTIMATES INPUTS	
Dehy Design Rating (MMscf/d) =	12.0
TEG Pump Rate (gpm) =	5.0
Pressure (psig) =	74.08
Temperature (^{0}F) =	71.83
Wet Gas Water Content (lb H2O/mmscf) =	64.2
Dry Gas Water Content (lb H2O/mmscf) =	21.5
Hours of Operation =	8760

(a) CO_2 equivalent = [(CO_2 emissions)*(GWP_{CO2})]+[(CH_4 emissions)*(GWP_{CH4})]+[(N_2O emissions)*(GWP_{N2O})]

Global Warming Potential (GWP)

CO_2	1	(2)
CH_4	25	(2)
N_2O	298	(2)

Notes:

(1) Current PTE emissions based on most recent wet gas analysis from 2017 are calculated utilizing GRI-GLYCalc 4.0 and reflect the controlled combined regenerator vent/flash gas emissions

(2) Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

Table 8. Tank Emissions
Nytis Exploration Company - Staten Run Compressor Station

Emission Unit ID	Tank Capacity (gal)	Tank Contents	Control Devices	Tank Throughput (bbls/day)	VOC Emission Factor (lbs/bbls)		VOC Emissions (lbs/yr)[a]	VOC Emissions (lb/hr)[b]	VOC Emissions (tons/yr)[c]
T02	2150	Used Oil	None	0.70	1.80E-03	(2)	0.46	0.000	0.000
T03	2100	Pipeline Liquids	None	5.00	3.50E-01	(1)	638.75	0.073	0.319
T05	1050	Pipeline Liquids	None	5.00	3.50E-01	(1)	638.75	0.073	0.319
T06	1050	Pipeline Liquids	None	5.00	3.50E-01	(1)	638.75	0.073	0.319
T07	520	TEG	None	0.17	3.23E-04	(2)	0.02	0.000	0.000
T08	1000	Engine Oil	None	0.33	5.38E-03	(2)	0.64	0.000	0.000
Totals							**1917.37**	**0.22**	**0.96**

Calculations:

(a) VOC Emissions (lb/day) = Tank Throughput (bbls/day) * VOC Emission Factor (lbs/bbls)

(b) VOC Emissions (lb/hr) = VOC Emissions (lbs/yr) * (yr/8760hr)

(c) VOC Emissions (ton/yr) = VOC Emissions (lbs/yr) * (1ton/2000lbs)

Notes:

(1) VOC emission factor includes Flashing/Working/Breathing losses calculated from pressurized liquid sample (GOR= 0.35 lb VOC/bbl) direct flash measurement. The pressurized liquid sample was taken from the Putnam B6 site on 4/25/2013 and is considered to be worst case representative with respect to gas composition and pressure at the Station

(2) VOC emission factor includes Working/Breathing losses as calculated from TANKS 4.0.9.d

Table 9. Truck Loading (TL-1) VOC Emissions
Nytis Exploration Company - Staten Run Compressor Station

Contents	Volume Transferred [3]	Loading Loss [(a)] (lb VOC/1000gal)	PTE VOC Emissions (lb/hr)	PTE VOC Emissions (ton/yr) [(b)]
Pipeline Liquids	229,950 gal/yr	3.659	0.096	0.421
Total			**0.096**	**0.421**

Calculations:

(a) Loading Loss (lbs/1000 gal) = 12.46x[Saturation Factor] x [True Vapor Pressure of Liquid Loaded (psia)] x[Molecular Weight of Vapors(lbs/lbmole)]/ [Temperature of Bulk Liquid Loaded(°R)]

(b) Annual Emissions(tons/yr) = [Loading Loss (lb VOC/ 1000 gal)]*[Volume Transferred(gal/yr)]/1000/2000

	Pipeline liquids	
Saturation factor	0.60	Note [(1)]
Pvap (psia)	7.70	Note [(2)]
Molecular Weight Vap (lb/lbmol)	33.37	Note [(2)]
Bulk Liquid Tempurature (F)	65.00	Note [(2)]

Notes:

(1) AP-42 Section 5.2, Table 5.2-1 Saturation Factors for Calculating Petroleum Liquid Loading Losses, Submerged loading - dedicated normal service

(2) Putnam B6 Compressor Station Pressurized Separator Sampling and Emission Estimation Report, August 2013

(3) Annual rates based on maximum throughput of 5 bbls/d

Table 10. Fugitive Leak Emissions
Nytis Exploration Company - Staten Run Compressor Station

Pollutant	Emission Factor (1)		PTE[(a) Gas Service] (tons/yr)	PTE VOC emissions (ton/yr)	PTE CO_2e emissions (ton/yr)	PTE Total HAPs emissions (ton/yr)
Valves	9.9E-03	lb/hr/source	4.82	0.22	4.85	0.00
Pressure Relief Valves	1.9E-02	lb/hr/source	0.25	0.01	0.26	0.00
Connectors (2)	8.6E-04	lb/hr/source	1.80	0.08	1.81	0.00
Open Ended Lines	4.4E-03	lb/hr/source	0.08	0.00	0.08	0.00
Total	-	-	6.95	0.32	7.00	0.01

Pollutant	PTE Benzene emissions (ton/yr)	PTE Toluene emissions (ton/yr)	PTE Ethylbenzene emissions (ton/yr)	PTE Xylenes emissions (ton/yr)	PTE n-Hexane emissions (ton/yr)
Valves	1.45E-04	1.93E-04	0.00E+00	9.64E-05	4.00E-03
Pressure Relief Valves	7.64E-06	1.02E-05	0.00E+00	5.09E-06	2.11E-04
Connectors (2)	5.41E-05	7.21E-05	0.00E+00	3.60E-05	1.50E-03
Open Ended Lines	2.32E-06	3.09E-06	0.00E+00	1.54E-06	6.41E-05
Total	0.00	0.00	0.00	0.00	0.01

Calculations:

(a) Annual emissions (tons/yr) = [Emission Factor (lb/hr/source)] x [Number of Sources] x [Hours of Operation per Year] x [ton/2000lb]

WET GAS INPUTS TABLE	
Gas Stream Components	**Wt Percent**
Methane	88.39%
Ethane	7.05%
VOC	4.56%
Benzene	0.00%
Toluene	0.00%
Ethylbenzene	0.00%
Xylenes	0.00%
n-Hexane	0.08%

(3) Number of Components in Gas Service

Valves =	111
Pressure Relief Valves =	3
Connectors =	479
Open Ended Lines =	4
Maximum Hour of Operation =	8,760

Global Warming Potential (GWP)

CO_2	1	(4)
CH_4	25	(4)
N_2O	298	(4)

(1) Emission factors from 1995 EPA Protocol for Equipment Leak Emission Estimates, Table 2-4 Oil and Gas Production

(2) Connectors is assumed to include flange connections in the total count

(3) *Default Average Component Counts for Major Onshore Natural Gas Production Equipment* from 40 CFR 98, Subpart W, Table W-1B

(4) Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

Table 11. Reciprocating Engine / Compressor Emissions (#1 through #4) Blowdown Venting
Nytis Exploration Company - Staten Run Compressor Station

Pollutant	Maximum Hourly Emissions		Annual Emissions	
	Emission Factor	PTE per Engine Event (lb/hr)	Emission Factor	Annual PTE (tons/yr)
Criteria Pollutants				
VOC	1.59E+00 lb/Event (1)	1.59 (a)	1.59E+00 lb/Event (1)	0.04 (a)

(1) 1.59 lbs VOC / Engine blowdown event; based on 717 scf/event of 18.77 MW gas with 4.56 wt % VOC

(a) Worst case blowdown events per year = 48 : 1 per unit per month x 4 units x 12 months = 48 blowdown events per year

ATTACHMENT O

MONITORING/RECORDKEEPING/REPORTING/ TESTING PLANS

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Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

MONITORING, RECORD KEEPING, REPORTING, TESTING PLANS

Monitoring

The company will at a minimum monitor hours of operation, site production throughputs, as well as planned and unplanned maintenance of permitted equipment comprising the facility.

Recordkeeping

Records of maintenance conducted on the unit, #4, shall be kept in accordance with §63.6655 and Table 2d (Line 6).

The unit, #4, will also be subject to the rod packing standards of §60.5385 that require them to be replaced/rebuilt every 26,000 hrs or 3 years. Records shall be maintained based on months or hours of operations since initial startup and each subsequent rebuild or replacement of the compressor's rod packing.

The company will retain records for five (5) years, two (2) years on site, certified by a company official at such time that the DAQ may request said records.

In addition to those mentioned above, the company will keep records of the items monitored, such as station throughput, hours of operation, benzene emissions, planned and unplanned maintenance activities, and any complaints regarding the facility.

Reporting

The company will report any equipment malfunctions, emission limit or visible emissions (VE) deviations.

Testing

The wet gas to the dehy will be sampled and tested periodically to assess compliance with TEG dehy's emission limitations.

ATTACHMENT P

PUBLIC NOTICE

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

April 2018

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Nytis Exploration Company LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Modification Permit, for a natural gas compressor station located off U.S. Route 60 near Montgomery, in Kanawha County, West Virginia. The latitude and longitude coordinates are: 38.18817, -80.32226.

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

Pollutant	Tons/yr
VOCs	2.08
PM/PM_{10}/$PM_{2.5}$	0.04
Total HAPs	0.02

Modification of operations are after the fact and are a result of estimating emissions with more accurate data. 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 ____th of April, 2018.

By: Nytis Exploration Company LLC
Lloyd A. Hall
Vice President of Operations
2480 Fortune Dr., Suite 300
Lexington, KY 40509

ATTACHMENT Q

BUSINESS CONFIDENTIAL CLAIMS

NOT APPLICABLE (SEE NOTES)

No information contained within this application claimed as confidential

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Staten Run Compressor Station,
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ATTACHMENT R

AUTHORITY FORMS

NOT APPLICABLE (SEE NOTES)

No delegation of authority necessary

Rule 13 Permit Modification Application

Staten Run Compressor Station,
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ATTACHMENT S

TITLE V PERMIT REVISION INFORMATION

Rule 13 Permit Modification Application

Staten Run Compressor Station,
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Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

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Attachment S

Title V Permit Revision Information

1. New Applicable Requirements Summary	
Mark all applicable requirements associated with the changes involved with this permit revision:	
☒ SIP	☐ FIP
☒ Minor source NSR (45CSR13)	☐ PSD (45CSR14)
☐ NESHAP (45CSR15)	☐ Nonattainment NSR (45CSR19)
☐ Section 111 NSPS (Subpart(s)_____)	☐ Section 112(d) MACT standards (Subpart(s)_____)
☐ Section 112(g) Case-by-case MACT	☐ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts.	☐ Stratospheric ozone (Title VI)
☐ Tank vessel reqt., section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☐ 45CSR27 State enforceable only rule
☐ 45CSR4 State enforceable only rule	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ Compliance Assurance Monitoring (40CFR64) (1)
☐ NO_x Budget Trading Program Non-EGUs (45CSR1)	☐ NO_x Budget Trading Program EGUs (45CSR26)

(1) If this box is checked, please include **Compliance Assurance Monitoring (CAM) Form(s)** for each Pollutants Specific Emission Unit (PSEU) (See Attachment H to Title V Application). If this box is not checked, please explain why **Compliance Assurance Monitoring** is not applicable:

2. Non Applicability Determinations

List all requirements, which the source has determined not applicable to this permit revision and for which a permit shield is requested. The listing shall also include the rule citation and a rationale for the determination.

☐ **Permit Shield Requested** *(not applicable to Minor Modifications)*

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

3. Suggested Title V Draft Permit Language

Are there any changes involved with this Title V Permit revision outside of the scope of the NSR Permit revision? ☒ Yes ☐ No If Yes, describe the changes below.

Also, please provide **Suggested Title V Draft Permit language** for the proposed Title V Permit revision (including all applicable requirements associated with the permit revision and any associated monitoring /recordkeeping/ reporting requirements), OR attach a marked up pages of current Title V Permit. Please include appropriate citations (Permit or Consent Order number, condition number and/or rule citation (e.g. 45CSR§7-4.1)) for those requirements being added / revised.

As the DAQ has noted, the updated PTE estimates NYTIS submitted to the agency were identified as exceeding Major Source Title V thresholds (NOx emissions at ~180 TPY). The Staten Run facility will be subject to 45CSR30 permitting requirements. Nytis Exploration requests to reopen Title V permit R30-03900044-2007 in active status. The permit was placed in inactive status after HAP emissions decreased below Title V Major Source thresholds in April 2011.

Attach "marked up pages" of previous/inactive Title V permit.

4. Active NSR Permits/Permit Determinations/Consent Orders Associated With This Permit Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
R13-2863A	11/19/2013	
	/ /	
	/ /	

5. Inactive NSR Permits/Obsolete Permit or Consent Orders Conditions Associated With This Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
R13-2863	01/11/2011	
R30-03900044-2007	01/23/2007	
	/ /	

6. Change in Potential Emissions

Pollutant	Change in Potential Emissions (+ or -), TPY
NOx	+ 52.49 TPY
CO	- 91.73 TPY
VOC	+ 9.69 TPY
SO2	- 0.01 TPY

PM/PM10/ PM2.5	- 0.12 TPY
Formaldehyde	- 0.39 TPY
All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.	

7. Certification For Use Of Minor Modification Procedures *(Required Only for Minor Modification Requests)*

Note:	*This certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete. The criteria for allowing the use of Minor Modification Procedures are as follows:*

i. Proposed changes do not violate any applicable requirement;

ii. Proposed changes do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;

iii. Proposed changes do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient air quality impacts, or a visibility increment analysis;

iv. Proposed changes do not seek to establish or change a permit term or condition for which there is no underlying applicable requirement and which permit or condition has been used to avoid an applicable requirement to which the source would otherwise be subject (synthetic minor). Such terms and conditions include, but are not limited to a federally enforceable emissions cap used to avoid classification as a modification under any provision of Title I or any alternative emissions limit approved pursuant to regulations promulgated under § 112(j)(5) of the Clean Air Act;

v. Proposed changes do not involve preconstruction review under Title I of the Clean Air Act or 45CSR14 and 45CSR19;

vi. Proposed changes are not required under any rule of the Director to be processed as a significant modification;

Notwithstanding subparagraph 45CSR§30-6.5.a.1.A. (items i through vi above), minor permit modification procedures may be used for permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, to the extent that such minor permit modification procedures are explicitly provided for in rules of the Director which are approved by the U.S. EPA as a part of the State Implementation Plan under the Clean Air Act, or which may be otherwise provided for in the Title V operating permit issued under 45CSR30.

Pursuant to 45CSR§30-6.5.a.2.C., the proposed modification contained herein meets the criteria for use of Minor permit modification procedures as set forth in Section 45CSR§30-6.5.a.1.A. The use of Minor permit modification procedures are hereby requested for processing of this application.

(Signed):	_____ *(Please use blue ink)*	Date:	____ / ____ / ____ *(Please use blue ink)*
Named (typed):		Title:	

Note: Please check if the following included (if applicable):

☐	Compliance Assurance Monitoring Form(s)
☐	Suggested Title V Draft Permit Language

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

APPLICATION FEE

Rule 13 Permit Modification Application

Staten Run Compressor Station,
Montgomery, West Virginia

Nytis Exploration Company LLC

102 3rd St.
Glasgow, West Virginia

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