April 18, 2017



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

**Re: Columbia Gas Transmission, LLC (CGT), Title V Renewal Application, R30-04300002-2017**

Dear Mr. Durham,

Columbia Gas Transmission, LLC (CGT) and SLR International Corporation have prepared the attached 45CSR30 Title V Renewal Application for the Hubball Compressor Station located in Lincoln County, West Virginia (Facility ID 043-00002). The facility is currently operating under Title V operating permit number R30-04300002-2017.

In preparation for this renewal the existing terms and conditions of the Title V permit were reviewed and evaluated. As a result of this evaluation, suggested Title V permit language has been developed that moves away from the old natural gas General Permit format. This is in an effort to enhance compliance clarity and bring the permit up to EPA's current expectations. These suggested changes to permit content and format have been compiled within a proposed permit document submitted for consideration within this application. The proposed permit has also been supplied in Microsoft Word format within the electronic submittal in hopes of being a useful tool for the reviewing Engineer's convenience.

SLR would be more than happy to discuss the details of the proposed permit language or the Title V Renewal Application at your convenience. If any additional information is needed, please feel free to contact me by telephone at (304) 545-8563 or by e-mail at jhanshaw@slrconsulting.com

Sincerely,
**SLR International Corporation**

Jesse Hanshaw

Jesse Hanshaw
Principal Engineer

Cc: Mr. Mitch Lagerstrom, CGT Air Compliance Manager

global environmental solutions

# Columbia Gas Transmission, LLC

## Hubball Compressor Station

## Facility ID No. 043-00002

## Branchland, West Virginia

## Title V Operating Permit Renewal Application

SLR Ref: 116.01272.00011

April 2017

Columbia Gas Transmission

# Title V Operating Permit Renewal Application

Prepared for:

**Columbia Gas Transmission, LLC**
1700 MacCorkle Avenue, SE
Charleston, West Virginia 25314

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

Jesse Hanshaw, P.E.
Principal Engineer

Columbia Gas Transmission

# CONTENTS

**ATTACHMENTS**



Notes:
ATTACHMENT F – N/A – Source is in compliance with all facility wide requirements
ATTACHMENT H – N/A – No CAM plan requirements at the facility

# APPLICATION FOR PERMIT

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**DIVISION OF AIR QUALITY**

601 57th Street SE

Charleston, WV 25304

Phone: (304) 926-0475

www.dep.wv.gov/daq

# INITIAL/RENEWAL TITLE V PERMIT APPLICATION - GENERAL FORMS

***Section 1: General Information***

| | |
|---|---|
| 1. **Name of Applicant (As registered with the WV Secretary of State's Office):**<br>Columbia Gas Transmission, LLC | **2. Facility Name or Location:**<br>Hubball Compressor Station |
| **3. DAQ Plant ID No.:**<br>043-00002 | **4. Federal Employer ID No. (FEIN):**<br>31-0802435-30 |

5. **Permit Application Type:**

☐ Initial Permit — When did operations commence? 1948

☒ Permit Renewal — What is the expiration date of the existing permit? 10/31/2017

☐ Update to Initial/Renewal Permit Application

**6. Type of Business Entity:**

☐ Corporation ☐ Governmental Agency ☒ LLC

☐ Partnership ☐ Limited Partnership

**7. Is the Applicant the:**

☐ Owner ☐ Operator ☒ Both

If the Applicant is not both the owner and operator, please provide the name and address of the other party.

_____

_____

_____

**8. Number of onsite employees:**

Less than ten (10) employees

**9. Governmental Code:**

☒ Privately owned and operated; 0

☐ Federally owned and operated; 1

☐ State government owned and operated; 2

☐ County government owned and operated; 3

☐ Municipality government owned and operated; 4

☐ District government owned and operated; 5

**10. 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.

| **11. Mailing Address** | | |
|---|---|---|
| **Street or P.O. Box:**<br>5151 San Felipe St., Suite 2400 | | |
| **City:** Houston | **State:** TX | **Zip:** 77056 |
| **Telephone Number:** (713) 386 3701 | **Fax Number:** (713) 386 3456 | |

| **12. Facility Location** | | |
|---|---|---|
| **Street:** Secondary Route 36/1 | **City:** Branchland | **County:** Lincoln |
| **UTM Easting:** 396.016 km | **UTM Northing:** 4,228.873 km | **Zone:** ☒ 17 or ☐ 18 |
| **Directions:**<br>Take Exit 11 from Interstate 64 to State Route 10 South. Travel along SR 10 South to Branchland. At Branchland, cross the bridge to Secondary Route 36/1, then go approximately 2 miles south on 36/1 to Hubball Station. | | |
| **Portable Source?** ☐ Yes ☒ No | | |
| **Is facility located within a nonattainment area?** ☐ Yes ☒ No | | **If yes, for what air pollutants?** |
| **Is facility located within 50 miles of another state?** ☒ Yes ☐ No | | **If yes, name the affected state(s).**<br>Kentucky<br>Ohio |
| **Is facility located within 100 km of a Class I Area[1]?** ☐ Yes ☒ No<br>**If no, do emissions impact a Class I Area[1]?** ☐ Yes ☒ No | | **If yes, name the area(s).** |

[1] *Class I areas include Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and Shenandoah National Park and James River Face Wilderness Area in Virginia.*

| **13. Contact Information** | | |
|---|---|---|
| **Responsible Official:** John Corlis | | **Title:** Manager of Operations |
| **Street or P.O. Box:**<br>1675 Muddy Creek Rd. | | |
| **City:** Winchester | **State:** KY | **Zip:** 40392 |
| **Telephone Number:** (859) 745 6403 | **Fax Number:** (304) 357-2770 | |
| **E-mail address:** john_corlis@transcanada.com | | |
| **Environmental Contact:** Mili Patel | | **Title:** Senior Air Quality Engineer |
| **Street or P.O. Box:**<br>5151 San Felipe St., Suite 2400 | | |
| **City:** Houston | **State:** TX | **Zip:** 77056 |
| **Telephone Number:** (713) 386 3692 | **Fax Number:** (713) 386 3456 | |
| **E-mail address:** mili_patel@transcanada.com | | |
| **Application Preparer:** Jesse Hanshaw | | **Title:** Principal Engineer |
| **Company:** SLR International Corporation | | |
| **Street or P.O. Box:**<br>8 Capitol St., Suite 300 | | |
| **City:** Charleston | **State:** WV | **Zip:** 25301 |
| **Telephone Number:** (681) 205-8949 | **Fax Number:** (681) 205-8969 | |
| **E-mail address:** jhanshaw@slrconsulting.com | | |

**14. Facility Description**

List all processes, products, NAICS and SIC codes for normal operation, in order of priority. Also list any process, products, NAICS and SIC codes associated with any alternative operating scenarios if different from those listed for normal operation.

| Process | Products | NAICS | SIC |
|---|---|---|---|
| Natural Gas Processing | Crude Petroleum and Natural Gas | 211111 | 1311 |
| | | | |
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**Provide a general description of operations.**

Hubball Compressor Station is a natural gas gathering and compression facility covered by Standard Industrial Classification (SIC) Code 1311. The station has the potential to operate twenty-four (24) hours per day, seven (7) days per week, fifty-two (52) weeks per year. The station consists of two (2) 1,320 hp Ingersoll-Rand 48KVS, 4SLB reciprocating engines, one (1) 600 hp, Clark RA-6, 2SLB reciprocating engine, one (1) 229 hp, Waukesha F11GSI, 4SRB reciprocating engine/generator, one (1) 0.75 mmBtu/hr NATCO SB24-18 dehydrator reboiler, one (1) 35.1 mmscf/day BS&B TEG dehydration unit, and one (1) 1.0 mmBtu/hr NATCO SHV-2.5 dehydrator flare.

15. Provide an **Area Map** showing plant location as **ATTACHMENT A**.

16. Provide a **Plot Plan(s)**, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is located as **ATTACHMENT B**. For instructions, refer to "Plot Plan - Guidelines."

17. Provide a detailed **Process Flow Diagram(s)** showing each process or emissions unit as **ATTACHMENT C**. Process Flow Diagrams should show all emission units, control equipment, emission points, and their relationships.

***Section 2: Applicable Requirements***

| **18. Applicable Requirements Summary** | |
|---|---|
| Instructions: Mark all applicable requirements. | |
| ☒ SIP | ☐ FIP |
| ☒ Minor source NSR (45CSR13) | ☐ PSD (45CSR14) |
| ☒ NESHAP (45CSR34) | ☐ Nonattainment NSR (45CSR19) |
| ☐ Section 111 NSPS | ☐ Section 112(d) MACT standards |
| ☐ 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) | ☐ **C**ompliance **A**ssurance **M**onitoring (40CFR64) |
| ☐ CAIR $NO_x$ Annual Trading Program (45CSR39) | ☒ CAIR $NO_x$ Ozone Season Trading Program (45CSR40) |
| ☐ CAIR $SO_2$ Trading Program (45CSR41) | |

**19. Non Applicability Determinations**

**List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.**

45CSR4 – *To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors:* According to 45CSR§4-7.1, this rule shall not apply to the following sources of objectionable odor until such time as feasible control methods are developed: Internal Combustion Engines

45CSR10 – *To Prevent and Control Air Pollution from the Emission of Sulfur Oxides:* 45CSR10 is not applicable to the facility's boiler because the maximum design heat input (DHI) is less than 10 MMBtu/hr. Additionally, the dehydration still vent is considered exempt from the manufacturing source requirements due to having a potential of less than 500 lb SO2/yr in accordance with 45CSR§10-4.1.e.

45CSR21 – *To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds:* All storage tanks at the station, which are listed as insignificant sources, are below 40,000 gallons in capacity which exempts the facility from 45CSR§21-28. The compressor station is not engaged in the extraction or fractionation of natural gas which exempts the facility from 45CSR§21-29. Additionally this site is not located within one of the five designated VOC maintenance counties (Cabell, Kanawha, Putnam, Wayne & Wood)

☒ Permit Shield

**19. Non Applicability Determinations *(Continued)*** - *Attach additional pages as necessary.*

**List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.**

45CSR27 – *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."

40 CFR 60 Subpart Dc – *Standards of Performance for Steam Generating Units:* The reboiler at this facility is less than 10 mmBtu/hr; Hence Subpart Dc is not applicable in accordance with 60.40c(a)

40 CFR 60 Subparts K,Ka – *Standards of Performance for Storage Vessels for Petroleum Liquids:* All tanks at the facility are below 40,000 gallons in capacity as specified in 60.110a(a)

40 CFR 60 Subpart Kb – *Standards of Performance for Volatile Organic Liquid Storage Vessels:* All tanks at the facility are below 75$m^3$ (19,813 gallons) in capacity as specified in 60.110b(a)

40 CFR 60 Subpart KKK – *Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plant:* This compressor 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.

40 CFR 60 Subpart JJJJ – *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines:* All engines at the facility were constructed, reconstructed, or modified prior to the June 12, 2006 applicability date listed in 60.4230(a)(4).

40 CFR 60 Subpart OOOO – *Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution*: The Storage Vessel, Pneumatic Controller, and Compressor Packing requirements defined for Production Gathering and Boosting Stations is not applicable to this site because all potentially affected sources commenced construction, reconstruction, or modification prior to August 23, 2011 as stated in accordance with [40CFR§60.5365(e)]. No other affected sources were identified at this site.

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 constructed, reconstruction, or modification prior to September 18, 2015 in accordance with [40CFR§60.5365a]

40 CFR 63 Subpart HHH – *National Emission Standards for Hazardous Air Pollutants from Natural gas Transmission and Storage Facilities:* This subpart does not apply to the facility since it is not a major source of HAPs as defined in 40CFR§63.1270(a).

40 C.F.R. 63 Subpart DDDDD; *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters:* This subpart does not apply to the facility since it not a major source of HAPs as defined in 40CFR§63.7575.

40 C.F.R. 63 Subpart JJJJJJ; *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources:* This subpart does not apply to the facility since the boiler is fueled by natural gas as defined in 40CFR§63.11195(e).

40 CFR 64 – *Compliance Assurance Monitoring (CAM):* There are no add-on controls at this facility, which the exception of the TEG dehy, which is subject to 40 CFR 63, Subpart HH; therefore, in accordance with 40CFR§64.2(b)(1), CAM is not applicable to this facility.

☒ Permit Shield

**20. Facility-Wide Applicable Requirements**

**List all facility-wide applicable requirements. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*).**

T5 – 3.1.1 – 45 CSR 6-3.1 – Open burning prohibited
T5 – 3.1.2 – 45 CSR 6-3.2 – Open burning exemption stipulations
T5 – 3.1.3 – 40 CFR Part 61 and 45 CSR 34 – Asbestos inspection and removal
T5 – 3.1.4 – 45 CSR 4 – No objectionable odors
T5 – 3.1.5 – 45 CSR 11-5.2 – Standby plans for emergency episodes
T5 – 3.1.6 – WV Code 22-5-4 (a) (14) – Annual emission inventory reporting
T5 – 3.1.7 – 40 CFR Part 82 Subpart F – Ozone depleting substances
T5 – 3.1.8 – 40 CFR Part 68 – Risk Management Plan
T5 – 3.1.9 – 45 CSR 30-12.7 – Odor Control for Mercaptan
T5 – 3.1.10 – 45 CSR 30-12.7 – Emergency Operating Conditions / unit replacement
T5 – 3.3.1 – 45 CSR 22-5-4(a)(14-15) & 45CSR13 - Stack Testing - Conduct stack testing as required
T5 – 3.4.1 – 45 CSR 30-5.1 - Monitoring information – general monitoring requirements
T5 – 3.4.2 – 45 CSR 30-5.1 - Retention of records - Maintain records for a period of 5 years
T5 – 3.4.3 – 45 CSR 30-5.1 - Odors - Maintain records of odor complaints and corrective actions
T5 – 3.4.4 – 45 CSR 17.3 – Fugitive PM shall not cause statutory Air Pollution
T5 – 3.5.1 – 45 CSR 30-4.4. and 5.1.c.3.D – All documents required by permit shall be certified by a Responsible Official
T5 – 3.5.2 – 45 CSR 30-5.1.c.3.E. - A permittee may request confidential treatment
T5 – 3.5.3 – 45 CSR 30-5 - Communication required or permitted to be made to the DEP and/or USEPA
T5 – 3.5.4 – 45 CSR 30-8 - Certified emissions statement – Operator will Submit a certified emissions statement and pay fees on an annual basis
T5 – 3.5.5 – 45 CSR 30-5.3.e. - Compliance certification. The permittee shall certify compliance with the conditions of this permit on the forms provided by the DAQ
T5 – 3.5.6 – 45 SR§30-5.1.c.3.A - Semi-annual monitoring reports.
T5 – 3.5.7 – 45 CSR 30-5.7.a through e. - Emergencies
T5 – 3.5.8 – 45 CSR 30-5.1.c.3.B. and C. - Deviations
T5 – 3.5.9 – 45 CSR 30-4.3.h.1.B. New applicable requirements. If any requirement is promulgated, the permittee will meet such requirements on a timely basis
T5 – 3.5.10 – 45 CSR 30-5.1.c.3.C. Natural Gas Use certification during Compliance Certification

☒ Permit Shield

**For all facility-wide applicable requirements listed above, provide monitoring/testing / recordkeeping / reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)**

T5 – 3.1.3 – 40 CFR Part 61 and 45 CSR 34 – Prior to demolition/construction buildings will be inspected for asbestos and documented accordingly
T5 – 3.1.4 – 45 CSR 4 – Permittee shall maintain records of all odor complaints received
T5 – 3.1.5 – 45 CSR 11 – Upon request by the Secretary, the permittee shall prepare a standby plan
T5 – 3.1.6 – WV 22-5-4 – The permittee shall submit annual emission inventory reports
T5 – 3.1.7 – 40 CFR Part 82 Subpart F – The permittee will prohibit maintenance, service, or repair of appliances containing ozone depleting substances without persons certified pursuant to 40 CFR 82.161
T5 – 3.1.8 – 40 CFR Part 68 – Should the permittee become subject to 40 CFR Part 68, a RMP shall be submitted
T5 – 3.1.10 – 45CSR§30-12.7 For emergency situations which interrupt the critical supply of natural gas to the public, and which pose a life threatening circumstance to the customer, the permittee is allowed to temporarily replace failed engine(s). Proper notice will be provided to the WVDAQ
T5 – 3.3.1 – 45 CSR 22-5-4 Stack Testing – All protocols and reports will be submitted to the WVDAQ
T5 – 3.4.1 & 3.4.2 – 45 CSR 30-5.1 Retention of Records - Maintain records of all information required by permit for 5 yrs.
T5 – 3.4.3 – 45 CSR 30-5.1 Odors - Maintain records of all odor complaints and responses.
T5 – 3.5.1 – 45 CSR 30-4.4 *and* 5.1 Responsible Official - Reports, certifications, etc. shall contain a certification by the responsible official.
T5 – 3.5.4 – 45 CSR 30-8 Certified emissions statement – Operator will Submit a certified emissions statement and pay fees on an annual basis
T5 – 3.5.5 – 45 SR§30-5.3.e Compliance Certification - Prepare and submit an emission inventory as requested
T5 – 3.5.6 – 45 CSR§30-5.1.c.3.A. Semi-annual monitoring reports.
T5 – 3.5.7 – 45 CSR30-5.7.a through e. - For reporting emergency situations, refer to Section 2.17 of this permit
T5 – 3.5.8 – 45 CSR 30-5.1.c.3.B. and C. – Deviations, In addition to required monitoring reports, the permittee shall promptly submit supplemental reports and notices of deviations / include upset conditions, cause of deviation(s) and corrective actions.
T5 – 3.5.9 – 45 CSR 30-4.3.h.1.B. New applicable requirements. If any requirement is promulgated, the permittee will meet such requirements on a timely basis
T5 – 3.5.10 – 45 CSR 30-5.1.c.3.C. During compliance certification, the facility shall certify that the facility burns natural gas in all stationary equipment except, when applicable, for emergency equipment.

**Are you in compliance with all facility-wide applicable requirements?** ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

| **21. Active Permits/Consent Orders** | | |
|---|---|---|
| Permit or Consent Order Number | Date of Issuance MM/DD/YYYY | List any Permit Determinations that Affect the Permit *(if any)* |
| CO-R1-C-2007-4A | 03/01/2007 | |
| R30-04300002-2012 | 10/31/2012 | |
| R13-2479C | 03/09/2015 | |
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| **22. Inactive Permits/Obsolete Permit Conditions** | | |
|---|---|---|
| Permit Number | Date of Issuance | Permit Condition Number |
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***Section 3: Facility-Wide Emissions***

| **23. Facility-Wide Emissions Summary [Tons per Year]** | |
|---|---|
| Criteria Pollutants | Potential Emissions |
| Carbon Monoxide (CO) | 71.94 |
| Nitrogen Oxides ($NO_X$) | 103.98 |
| Lead (Pb) | - |
| Particulate Matter ($PM_{2.5}$)[1] | 0.59 |
| Particulate Matter ($PM_{10}$)[1] | 0.59 |
| Total Particulate Matter (TSP) | 0.59 |
| Sulfur Dioxide ($SO_2$) | 0.87 |
| Volatile Organic Compounds (VOC) | 25.28 |
| Hazardous Air Pollutants[2] | Potential Emissions |
| Benzene | 0.29 |
| Toluene | 0.42 |
| Ethylbenzene | 0.08 |
| Xylene | 0.66 |
| n-Hexane | 0.31 |
| Formaldehyde | 5.95 |
| Acetaldehyde | 0.93 |
| Total HAPs | 9.84 |
| Regulated Pollutants other than Criteria and HAP | Potential Emissions |
| $CO2_e$ | 15,893.3 |
| | |
| | |
| | |

*[1]$PM_{2.5}$ and $PM_{10}$ are components of TSP.*
*[2]For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.*

***Section 4: Insignificant Activities***

| **24. Insignificant Activities (Check all that apply)** | | |
|---|---|---|
| ☒ | 1. | Air compressors and pneumatically operated equipment, including hand tools. |
| ☐ | 2. | Air contaminant detectors or recorders, combustion controllers or shutoffs. |
| ☒ | 3. | Any consumer product used in the same manner as in normal consumer use, provided the use results in a duration and frequency of exposure which are not greater than those experienced by consumer, and which may include, but not be limited to, personal use items; janitorial cleaning supplies, office supplies and supplies to maintain copying equipment. |
| ☒ | 4. | Bathroom/toilet vent emissions. |
| ☒ | 5. | Batteries and battery charging stations, except at battery manufacturing plants. |
| ☐ | 6. | Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents. Many lab fume hoods or vents might qualify for treatment as insignificant (depending on the applicable SIP) or be grouped together for purposes of description. |
| ☐ | 7. | Blacksmith forges. |
| ☐ | 8. | Boiler water treatment operations, not including cooling towers. |
| ☒ | 9. | Brazing, soldering or welding equipment used as an auxiliary to the principal equipment at the source. |
| ☐ | 10. | $CO_2$ lasers, used only on metals and other materials which do not emit HAP in the process. |
| ☒ | 11. | Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources. |
| ☒ | 12. | Combustion units designed and used exclusively for comfort heating that use liquid petroleum gas or natural gas as fuel. |
| ☒ | 13. | Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment. |
| ☐ | 14. | Demineralized water tanks and demineralizer vents. |
| ☐ | 15. | Drop hammers or hydraulic presses for forging or metalworking. |
| ☐ | 16. | Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam. |
| ☐ | 17. | Emergency (backup) electrical generators at residential locations. |
| ☐ | 18. | Emergency road flares. |
| ☒ | 19. | Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, $NO_x$, $SO_2$, VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year aggregate total for each criteria pollutant from all emission units.<br><br>Please specify all emission units for which this exemption applies along with the quantity of criteria pollutants emitted on an hourly and annual basis: |

| ***Emission Point*** | ***VOC Emissions (lb/hr)*** | ***VOC Emissions (lb/yr)*** |
|---|---|---|
| A05 | 0.000 | 2.00 |
| A06 | 0.000 | 0.56 |
| A07 | 0.000 | 0.05 |
| A08 | 0.000 | 0.05 |
| A09 | 0.000 | 0.32 |
| A10 | 0.082 | 722.29 |
| A11 | 0.226 | 1980.00 |
| A13 | 0.350 | 3061.71 |
| A14 | 0.000 | 0.11 |
| B01 | 0.000 | 1.01 |
| **Totals** | **0.66** | **5768.10** |

| **24. Insignificant Activities (Check all that apply)** | | |
|---|---|---|
| ☐ | 20. | Emission units which do not have any applicable requirements and which emit hazardous air pollutants into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year aggregate total for all HAPs from all emission sources. This limitation cannot be used for any source which emits dioxin/furans nor for toxic air pollutants as per 45CSR27.<br><br>Please specify all emission units for which this exemption applies along with the quantity of hazardous air pollutants emitted on an hourly and annual basis: |
| ☐ | 21. | Environmental chambers not using hazardous air pollutant (HAP) gases. |
| ☒ | 22. | Equipment on the premises of industrial and manufacturing operations used solely for the purpose of preparing food for human consumption. |
| ☐ | 23. | Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment. |
| ☒ | 24. | Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis. |
| ☐ | 25. | Equipment used for surface coating, painting, dipping or spray operations, except those that will emit VOC or HAP. |
| ☒ | 26. | Fire suppression systems. |
| ☒ | 27. | Firefighting equipment and the equipment used to train firefighters. |
| ☒ | 28. | Flares used solely to indicate danger to the public. |
| ☒ | 29. | Fugitive emission related to movement of passenger vehicle provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted. |
| ☐ | 30. | Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation. |
| ☒ | 31. | Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic. |
| ☐ | 32. | Humidity chambers. |
| ☐ | 33. | Hydraulic and hydrostatic testing equipment. |
| ☒ | 34. | Indoor or outdoor kerosene heaters. |
| ☒ | 35. | Internal combustion engines used for landscaping purposes. |
| ☐ | 36. | Laser trimmers using dust collection to prevent fugitive emissions. |
| ☐ | 37. | Laundry activities, except for dry-cleaning and steam boilers. |
| ☒ | 38. | Natural gas pressure regulator vents, excluding venting at oil and gas production facilities. |
| ☐ | 39. | Oxygen scavenging (de-aeration) of water. |
| ☐ | 40. | Ozone generators. |
| ☒ | 41. | Plant maintenance and upkeep activities (e.g., grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. (Cleaning and painting activities qualify if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners/operators must still get a permit if otherwise requested.) |
| ☒ | 42. | Portable electrical generators that can be moved by hand from one location to another. "Moved by Hand" means that it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device. |

| **24. Insignificant Activities (Check all that apply)** | | |
|---|---|---|
| ☐ | 43. | Process water filtration systems and demineralizers. |
| ☒ | 44. | Repair or maintenance shop activities not related to the source's primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification. |
| ☐ | 45. | Repairs or maintenance where no structural repairs are made and where no new air pollutant emitting facilities are installed or modified. |
| ☐ | 46. | Routing calibration and maintenance of laboratory equipment or other analytical instruments. |
| ☐ | 47. | Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants. Shock chambers. |
| ☐ | 48. | Shock chambers. |
| ☐ | 49. | Solar simulators. |
| ☒ | 50. | Space heaters operating by direct heat transfer. |
| ☐ | 51. | Steam cleaning operations. |
| ☐ | 52. | Steam leaks. |
| ☐ | 53. | Steam sterilizers. |
| ☒ | 54. | Steam vents and safety relief valves. |
| ☐ | 55. | Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized. |
| ☐ | 56. | Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP. Exemptions for storage tanks containing petroleum liquids or other volatile organic liquids should be based on size limits such as storage tank capacity and vapor pressure of liquids stored and are not appropriate for this list. |
| ☐ | 57. | Such other sources or activities as the Director may determine. |
| ☒ | 58. | Tobacco smoking rooms and areas. |
| ☒ | 59. | Vents from continuous emissions monitors and other analyzers. |

***Section 5: Emission Units, Control Devices, and Emission Points***

**25. Equipment Table**

Fill out the **Title V Equipment Table** and provide it as **ATTACHMENT D**.

**26. Emission Units**

For each emission unit listed in the **Title V Equipment Table**, fill out and provide an **Emission Unit Form** as **ATTACHMENT E**.

For each emission unit not in compliance with an applicable requirement, fill out a **Schedule of Compliance Form** as **ATTACHMENT F**.

**27. Control Devices**

For each control device listed in the **Title V Equipment Table**, fill out and provide an **Air Pollution Control Device Form** as **ATTACHMENT G**.

For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Title V Major Source Threshold Level, refer to the **Compliance Assurance Monitoring (CAM) Form(s)** for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as **ATTACHMENT H**.

*Section 6: Certification of Information*

**28. Certification of Truth, Accuracy and Completeness and Certification of Compliance**

*Note: This Certification must be signed by a responsible official. The **original**, signed in **blue ink**, must be submitted with the application. Applications without an **original** signed certification will be considered as incomplete.*

**a. Certification of Truth, Accuracy and Completeness**

I certify that I am a responsible official (as defined at 45CSR§30-2.38) and am accordingly authorized to make this submission on behalf of the owners or operators of the source described in this document and its attachments. I certify under penalty of law that I have personally examined and am familiar with the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine and/or imprisonment.

**b. 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.

**Responsible official (type or print)**

| Name: John Corlis | Title: Manager of Operations |
|---|---|

**Responsible official's signature:**

Signature: _____ Signature Date: 4-7-2017

(Must be signed and dated in blue ink)

| **Note: Please check all applicable attachments included with this permit application:** | |
|---|---|
| ☒ | ATTACHMENT A: Area Map |
| ☒ | ATTACHMENT B: Plot Plan(s) |
| ☒ | ATTACHMENT C: Process Flow Diagram(s) |
| ☒ | ATTACHMENT D: Equipment Table |
| ☒ | ATTACHMENT E: Emission Unit Form(s) |
| ☐ | ATTACHMENT F: Schedule of Compliance Form(s) |
| ☒ | ATTACHMENT G: Air Pollution Control Device Form(s) |
| ☐ | ATTACHMENT H: Compliance Assurance Monitoring (CAM) Form(s) |

***All of the required forms and additional information can be found and downloaded from, the DEP website at www.dep.wv.gov/daq, requested by phone (304) 926-0475, and/or obtained through the mail.***

# ATTACHMENT A

# AREA MAP

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017


GPS Coordinates of Sites:
Lat: 38.20181, Long: -82.18761

UTM Coordinates of Sites:
Easting: 396.016 km, Northing: 4,228.873 km, Zone 17

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, WV 25314

Report
Title V Operating Permit Renewal Application
Hubball Compressor Station (ID No. 043-00002)

Drawing
Attachment A - Area Map

Date: March 2016

Drawn By: CLB

Project: 116.01272.00011

SLR

# ATTACHMENT B

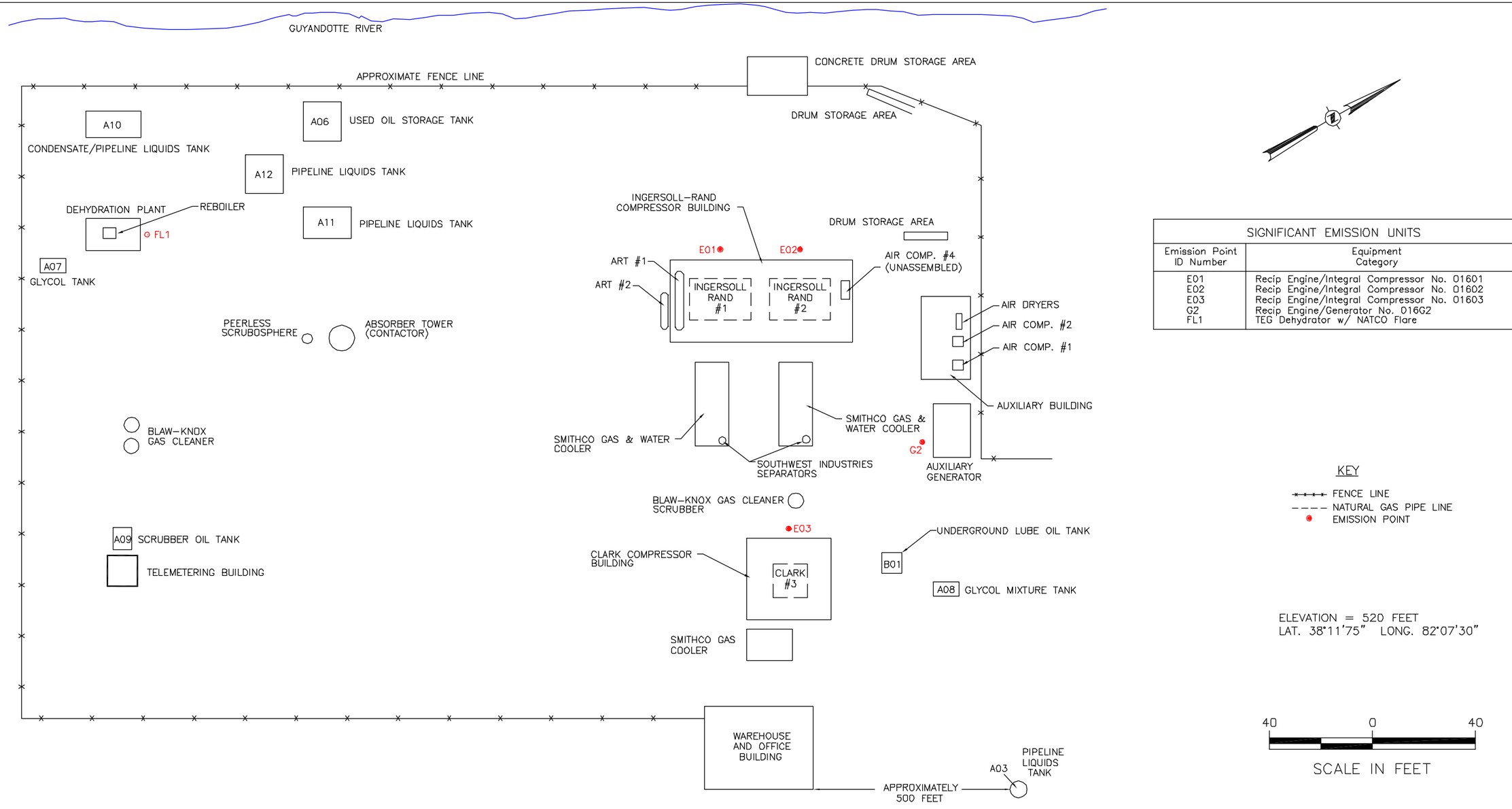
# PLOT PLAN

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017




| SIGNIFICANT EMISSION UNITS | |
|---|---|
| Emission Point ID Number | Equipment Category |
| E01 | Recip Engine/Integral Compressor No. 01601 |
| E02 | Recip Engine/Integral Compressor No. 01602 |
| E03 | Recip Engine/Integral Compressor No. 01603 |
| G2 | Recip Engine/Generator No. 016G2 |
| FL1 | TEG Dehydrator w/ NATCO Flare |

KEY

- FENCE LINE
- NATURAL GAS PIPE LINE
- EMISSION POINT

ELEVATION = 520 FEET
LAT. 38°11'75" LONG. 82°07'30"

40 0 40

SCALE IN FEET

P:\Common Projects\COLUMBIA\GENERAL\CADD\Hub-bm3.dwg October 18, 2010 - 11:33 AM

| | | | |
|---|---|---|---|
| SCALE: AS SHOWN | DESIGNED BY | DATE | DRAWING TITLE: Site Plan Columbia Gas Transmission Corp. Hubball Station |
| CONFIDENTIAL-ALL RIGHTS RESERVED-PROPERTY OF URS RDU, NORTH CAROLINA 27560 | DRAWN BY: TSH | DATE: 18OCT10 | |
| | CHECKED BY: DW | DATE: 18OCT10 | |
| | APPROVED BY: DW | DATE: 18OCT10 | CONTRACT NO.: 31827062 / DRAWING NO.: HUB-BM3 / REV.: 0 |

# ATTACHMENT C

# PROCESS FLOW DIAGRAM

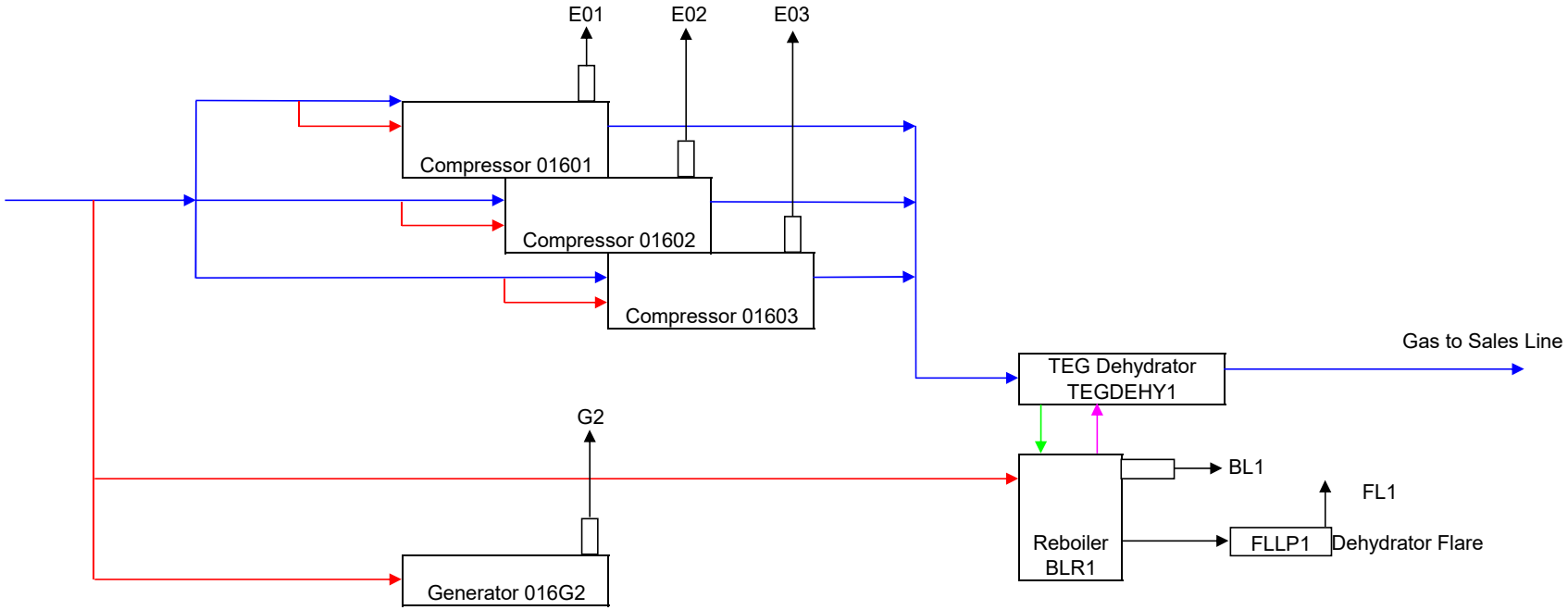
## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017

# ATTACHMENT C
# HUBBALL COMPRESSOR STATION PROCESS FLOW DIAGRAM




Columbia Gas Transmission

# ATTACHMENT D

# EQUIPMENT TABLE

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017

## ATTACHMENT D - Title V Equipment Table

**(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 19 of the General Forms)**

| Emission Point ID[1] | Control Device[1] | Emission Unit ID[1] | Emission Unit Description | Design Capacity | Year Installed/ Modified |
|---|---|---|---|---|---|
| BL1 | N/A | BLR1* | Dehydrator Reboiler; NATCO; Model # SB24-18 | 0.75 mmBtu/hr 1.25 mmBtu/hr (R13-2479C) | 1965 |
| E01 | C1 | 01601* | Reciprocating Engine/Integral Compressor; Ingersoll Rand 48KVS; 4 Cycle, Lean Burn | 1,320 Hp | 1966/2013 |
| E02 | C2 | 01602* | Reciprocating Engine/Integral Compressor; Ingersoll Rand 48KVS; 4 Cycle, Lean Burn | 1,320 Hp | 1966/2013 |
| E03 | N/A | 01603* | Reciprocating Engine/Integral Compressor; Clark RA-6; 2 Cycle, Lean Burn | 600 Hp | 1948 |
| G2 | N/A | 016G2* | Reciprocating Engine/Generator; Waukesha F11GSI; 4 Cycle, Rich Burn | 229 hp | 2000 |
| FL1 | FLLP1 | TEGDEHY1* | TEG Dehydrator; BS&B | 35.1 mmscf/day | 1998 |
| FL1 | N/A | FLLP1* | Dehydrator Flare; NATCO, Model SHV-2.5 | 1.00 mmBTU/hr | 1998 |
| | | | | | |

[1]For 45CSR13 permitted sources, the numbering system used for the emission points, control devices, and emission units should be consistent with the numbering system used in the 45CSR13 permit. For grandfathered sources, the numbering system should be consistent with registrations or emissions inventory previously submitted to DAQ. For emission points, control devices, and emissions units which have not been previously labeled, use the following 45CSR13 numbering system: 1S, 2S, 3S,... or other appropriate description for emission units; 1C, 2C, 3C,... or other appropriate designation for control devices; 1E, 2E, 3E, ... or other appropriate designation for emission points.

*This equipment burns pipeline quality natural gas only.

# ATTACHMENT E

# EMISSION UNIT FORM(S)

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017

# ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

| **Emission unit ID number:** | **Emission unit name:** | **List any control devices associated with this emission unit:** |
|---|---|---|
| 016G2 | Reciprocating Engine/Generator | NA |

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**
4-cycle, rich burn

| **Manufacturer:** | **Model number:** | **Serial number:** |
|---|---|---|
| Waukesha | VSG11GSI-F11GSI | NA |

| **Construction date:** | **Installation date:** | **Modification date(s):** |
|---|---|---|
| NA | 2000 | NA |

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**
229 hp (R13-2479C)

| **Maximum Hourly Throughput:** | **Maximum Annual Throughput:** | **Maximum Operating Schedule:** |
|---|---|---|
| NA | NA | 1,000 hrs/yr |

***Fuel Usage Data*** **(fill out all applicable fields)**

| **Does this emission unit combust fuel?** X Yes ___ No | **If yes, is it?** __ Indirect Fired X Direct Fired |
|---|---|
| **Maximum design heat input and/or maximum horsepower rating:** 229 hp (R13-2479C) | **Type and Btu/hr rating of burners:** 8,000 Btu / hp-hr |

**List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.**
Natural Gas 1,832 scf/hr 1,832,000 scf/yr

**Describe each fuel expected to be used during the term of the permit.**

| Fuel Type | Max. Sulfur Content | Max. Ash Content | BTU Value |
|---|---|---|---|
| Natural Gas | Pipeline Quality | | 1,000 Btu/scf |
| | | | |
| | | | |
| | | | |

***Emissions Data***

| Criteria Pollutants | Potential Emissions | |
|---|---|---|
| | PPH | TPY |
| Carbon Monoxide (CO) | See Appendix A | |
| Nitrogen Oxides ($NO_X$) | | |
| Lead (Pb) | | |
| Particulate Matter ($PM_{2.5}$) | | |
| Particulate Matter ($PM_{10}$) | | |
| Total Particulate Matter (TSP) | | |
| Sulfur Dioxide ($SO_2$) | | |
| Volatile Organic Compounds (VOC) | | |
| Hazardous Air Pollutants | Potential Emissions | |
| | PPH | TPY |
| | See Appendix A | |
| | | |
| | | |
| | | |
| Regulated Pollutants other than Criteria and HAP | Potential Emissions | |
| | PPH | TPY |
| | | |
| | | |
| | | |

**List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).**

See Appendix A

*Applicable Requirements*

**List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.**

**40 C.F.R. 63 Subpart ZZZZ**
40 C.F.R. § 63.6603 (a) and Table 2d (Line 5) – Maintenance Requirements

40 C.F.R. § 63.6605 – Operating Requirements

40 C.F.R. § 63.6625 (e)(3), (f), (h), and (j) – Monitoring Requirements

40 C.F.R. § 63.6640 and Table 6 (Line 9) – Continuous compliance requirements

40 C.F.R. § 63.6665 – General requirements/provisions

**45 C.S.R 13, Permit R13-2479C**
Condition 4.1.11 – Run Hour Limitation; Engine/Emergency Generator Set shall not run greater than 1,000 per year.

Condition 4.1.12 – Emission Limitations; Maximum emissions shall not exceed the following listed in the table below;

| *Pollutant* | *Maximum Hourly Emission (lb/hr)* | *Maximum Annual Emissions (ton/yr)* |
|---|---|---|
| $NO_X$ | 9.6 | 4.8 |
| CO | 35.3 | 17.64 |
| PM | 0.11 | 0.05 |
| $SO_2$ | 0.11 | 0.01 |
| VOC | 0.25 | 0.12 |

X Permit Shield

**For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)**

**40 C.F.R. 63 Subpart ZZZZ**
40 C.F.R. § 63.6603(a) and Table 2d (Line 5) – Change oil and filter every 500 hours of operation, or annually whichever comes first; inspect spark plugs every 1000 hours of operation, or annually, whichever occurs first; inspect hoses every 500 hours of operation, or annually, whichever occurs first and replace as necessary

40 C.F.R. §§ 63.6605 and Table 6 (Line 9) – Work or Management Practices: Operate and Maintain the RICE according to the manufacturer's instructions OR develop and follow your own maintenance plan

40 C.F.R. § 63.6625 (e) (3) – Operate and maintain the RICE according to the manufacturer's instructions OR develop and follow your own maintenance plan

40 C.F.R. § 63.6625 (f) – Install and monitor hours of operation

40 C.F.R. § 63.6625 (h) – Minimize Idle Time during Startup to not exceed 30 Minutes

40 C.F.R. § 63.6625 (j) – Oil Analysis Program in lieu of Oil change requirement in Table 2d (Line 5)

40 C.F.R. § 63.6640(f)(1) – There is no time limit to operation of unit during emergency situations.

40 C.F.R. § 63.6640(f)(2) – Operation of unit shall be limited to a maximum of 100 hours per calendar year for any combination of maintenance & readiness testing, emergency demand response, periods of voltage or frequency deviations and select non-emergency operations.

40 C.F.R. § 63.6640(f)(3) – Non emergency operations shall not exceed 50 hours per calendar year and are to be counted as part of the maximum 100 hours per calendar year operation limitation as described in 63.6640(f)(2)

40 C.F.R. § 63.6655 (except b & c) – Keep records of maintenance conducted and operating schedule on the RICE

**45 C.S.R 13, Permit R13-2479C**
Condition 4.3.3 – Upon request to determine compliance with emission limitations set forth by this permit, tests shall be conducted in accordance with the methods set forth in 40 CFR 60, Appendix A.

Condition 4.3.4 – With regards to emission testing, the permittee shall submit a test protocol to the WVDEP-DAQ and it must be received no less than 30 days prior to date of testing. Permittee shall also submit a notification of the actual dates and times testing to be conducted at least 15 days prior to testing. Once testing is completed, results shall be submitted within 30 days of completion.

Condition 4.4.7 – Maintain records of daily, monthly, and annual hours of operation for a period of five (5) years. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site but must remain accessible within a reasonable time. on site or at a readily accessible off-site location for a period of five (5) years and shall be readily available to the Director upon request.

**Are you in compliance with all applicable requirements for this emission unit?** X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

# ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

| **Emission unit ID number:** | **Emission unit name:** | **List any control devices associated with this emission unit:** |
|---|---|---|
| 01601 | Reciprocating Engine/Integral Compressor | C1 |

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**

4-cycle, lean burn

| **Manufacturer:** | **Model number:** | **Serial number:** |
|---|---|---|
| Ingersoll-Rand | 48KVS | NA |
| **Construction date:** | **Installation date:** | **Modification date(s):** |
| NA | 1966 | NA |

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):** 1,320 hp

| **Maximum Hourly Throughput:** | **Maximum Annual Throughput:** | **Maximum Operating Schedule:** |
|---|---|---|
| NA | NA | 8,760 |

***Fuel Usage Data*** **(fill out all applicable fields)**

| **Does this emission unit combust fuel?** X Yes ___ No | **If yes, is it?** __ Indirect Fired X Direct Fired |
|---|---|
| **Maximum design heat input and/or maximum horsepower rating:** 1,320 hp | **Type and Btu/hr rating of burners:** 8,400 Btu/hp-hr |

**List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.**

Natural Gas 11,958 scf/hr / 95,229,960 scf/yr

**Describe each fuel expected to be used during the term of the permit.**

| Fuel Type | Max. Sulfur Content | Max. Ash Content | BTU Value |
|---|---|---|---|
| Natural Gas | Pipeline Quality | | 1,000 Btu/scf |
| | | | |
| | | | |
| | | | |

| ***Emissions Data*** | | |
|---|---|---|
| Criteria Pollutants | Potential Emissions | |
| | PPH | TPY |
| Carbon Monoxide (CO) | See Appendix A | |
| Nitrogen Oxides ($NO_X$) | | |
| Lead (Pb) | | |
| Particulate Matter ($PM_{2.5}$) | | |
| Particulate Matter ($PM_{10}$) | | |
| Total Particulate Matter (TSP) | | |
| Sulfur Dioxide ($SO_2$) | | |
| Volatile Organic Compounds (VOC) | | |
| Hazardous Air Pollutants | Potential Emissions | |
| | PPH | TPY |
| | See Appendix A | |
| | | |
| | | |
| | | |
| Regulated Pollutants other than Criteria and HAP | Potential Emissions | |
| | PPH | TPY |
| | | |
| | | |
| | | |

**List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).**

See Appendix A

*Applicable Requirements*

**List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.**

**40 C.F.R. 63 Subpart ZZZZ**
40 C.F.R. § 63.6603 (a) and Table 2d (Line 9) – Oxidation Catalyst Operating Requirements

40 C.F.R. § 63.6605 – General Operating Requirements, must comply with all emission, operating, and work practice standards at all times.

40 C.F.R. § 63.6612(a) and Table 5 (Line 13) – Initial Compliance Demonstration Requirements, Initial Testing and CPMS for inlet catalyst temperature.

40 C.F.R. § 63.6625(h) – Monitoring Requirements

40 C.F.R. § 63.6630(e) – Initial Compliance Requirements

40 C.F.R. § 63.6640 and Table 6 (Line 14) – Continuous Compliance Requirements, Conduct annual compliance demonstrations in accordance with 63.6640(c) and continuously monitor inlet catalyst temperature or interlock the engine to shut down if the 1350 F is exceeded

40 C.F.R. § 63.6645 – Notification Submittal Requirements

40 C.F.R. § 63.6650 – Reporting Submittal Requirements, Semiannual CO demonstration

40 C.F.R. § 63.6665 – General Requirements/Provisions

**45 C.S.R 13, Permit R13-2479C**
Condition 4.1.1 – Emission Limitations; Maximum emissions shall not exceed the following listed in the table below;

| *Pollutant* | *Maximum Hourly Emissions (lb/hr)* | *Maximum Annual Emissions (ton/yr)* |
|---|---|---|
| CO | 5.56 | 22.14 |
| $NO_X$ | 35.00 | 41.30 |
| $PM_{10}$ | 0.01 | 0.01 |
| $SO_2$ | 0.70 | 0.30 |
| VOC | 1.44 | 5.73 |
| Formaldehyde | 0.64 | 2.57 |
| Benzene | 0.01 | 0.02 |

Condition 4.1.5 – Fuel Usage Requirements; Quantity of Natural Gas consumed shall not exceed in any calendar month an average hourly rate of 12,197 scf/hr or 97,130,880 scf/yr on an annual basis

Condition 4.1.13 – SO2 Hourly Limitation; Shall be demonstrated by maintaining an average hourly total sulfur content of fuel gas at or less than 20 grains of S / 100 scf of fuel gas.

Condition 4.1.14 – SO2 Annual Limitation; Shall be demonstrated by maintaining an average total sulfur content of fuel gas at or less than 2 grains of S / 100 scf of fuel gas.

X Permit Shield

**For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)**

**40 C.F.R. 63 Subpart ZZZZ**
40 C.F.R. § 63.6603(a) and Table 2d (Line 9) – Install oxidation catalyst to reduce HAP emissions from the stationary RICE.

40 C.F.R. § 63.6603(f) – Must meet the definition of remote stationary RICE in §63.6675 on initial compliance date of October

19, 2013 to be considered remote and then reevaluate every twelve (12) months

40 C.F.R. § 63.6612 and Table 5 (Line 13) – Conduct initial performance test or initial compliance demonstrations according to Table 5 (Line 13) within 180 days of the compliance date of October 19, 2013. Initial compliance has been achieved once an initial compliance demonstration as specified in §63.6630(e) has been conducted to show that the average reduction of emissions of CO is 93 percent or more, or the average CO concentration is less than or equal to 47 ppmvd at 15 percent $O_2$ and have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b), or you have installed equipment to automatically shut down the engine if the catalyst inlet temperature exceeds 1350 °F.

40 C.F.R. § 63.6625 (h) – Minimize Idle Time during Startup to not exceed 30 Minutes

40 C.F.R. § 63.6630 (e)(1) – Compliance demonstration must consist of at least three (3) test runs.

40 C.F.R. § 63.6630 (e)(2) – Each test run must be of at least 15 minute duration, except that each test conducted using the method in appendix A to this subpart must consist of at least one measurement cycle and include at least 2 minutes of test data phase measurement.

40 C.F.R. § 63.6640 and Table 6 (Line 14) – Install an Oxidation Catalyst and conduct annual compliance demonstrations as specified in §63.6640(c) to show that the average reduction of emissions of CO is 93 percent or more, or the average CO concentration is less than or equal to 47 ppmvd at 15 percent $O_2$ and either collect the catalyst inlet temperature data according to §63.6625(b), reducing these data to 4-hour rolling averages; and maintaining the 4-hour rolling averages within the limitation of greater than 450 °F and less than or equal to 1350 °F for the catalyst inlet temperature or immediately shut down the engine if the catalyst inlet temperature exceeds 1350 °F

40 C.F.R. § 63.6655 (a), (b), and (d) – Keep records of maintenance conducted and operating schedule on the RICE

**45 C.S.R 13, Permit R13-2479C**
Condition 4.3.2 – In order to demonstrate compliance with Conditions 4.1.13 and 4.1.14, sampling analyses for total sulfur shall be obtained. Records of total sulfur analyses shall be kept for a minimum five (5) years.

Condition 4.3.3 – Upon request to determine compliance with emission limitations set forth by this permit, tests shall be conducted in accordance with the methods set forth in 40 CFR 60, Appendix A.

Condition 4.3.4 – With regards to emission testing, the permittee shall submit a test protocol to the WVDEP-DAQ and it must be received no less than 30 days prior to date of testing. Permittee shall also submit a notification of the actual dates and times testing to be conducted at least 15 days prior to testing. Once testing is completed, results shall be submitted within 30 days of completion.

Condition 4.4.5 – Maintain accurate records of engine hours of operation, brake horsepower, and amount of natural gas consumed to prove compliance with Condition 4.1.5. Records of engine hours of operation shall be kept for a minimum of five (5) years.

**Are you in compliance with all applicable requirements for this emission unit?** X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

# ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

| **Emission unit ID number:** | **Emission unit name:** | **List any control devices associated with this emission unit:** |
|---|---|---|
| 01602 | Reciprocating Engine/Integral Compressor | C2 |

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**

4-cycle, lean burn

| **Manufacturer:** | **Model number:** | **Serial number:** |
|---|---|---|
| Ingersoll-Rand | 48KVS | NA |
| **Construction date:** | **Installation date:** | **Modification date(s):** |
| NA | 1966 | NA |

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):** 1,320 hp

| **Maximum Hourly Throughput:** | **Maximum Annual Throughput:** | **Maximum Operating Schedule:** |
|---|---|---|
| NA | NA | 8,760 |

***Fuel Usage Data*** **(fill out all applicable fields)**

| **Does this emission unit combust fuel?** X Yes ___ No | **If yes, is it?** __ Indirect Fired X Direct Fired |
|---|---|
| **Maximum design heat input and/or maximum horsepower rating:** 1,320 hp | **Type and Btu/hr rating of burners:** 8,400 Btu/hp-hr |

**List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.**

Natural Gas 11,958 scf/hr / 95,229,960 scf/yr

**Describe each fuel expected to be used during the term of the permit.**

| Fuel Type | Max. Sulfur Content | Max. Ash Content | BTU Value |
|---|---|---|---|
| Natural Gas | Pipeline Quality | | 1,000 Btu/scf |
| | | | |
| | | | |
| | | | |

| ***Emissions Data*** | | |
|---|---|---|
| Criteria Pollutants | Potential Emissions | |
| | PPH | TPY |
| Carbon Monoxide (CO) | See Appendix A | |
| Nitrogen Oxides ($NO_X$) | | |
| Lead (Pb) | | |
| Particulate Matter ($PM_{2.5}$) | | |
| Particulate Matter ($PM_{10}$) | | |
| Total Particulate Matter (TSP) | | |
| Sulfur Dioxide ($SO_2$) | | |
| Volatile Organic Compounds (VOC) | | |
| Hazardous Air Pollutants | Potential Emissions | |
| | PPH | TPY |
| | See Appendix A | |
| | | |
| | | |
| | | |
| Regulated Pollutants other than Criteria and HAP | Potential Emissions | |
| | PPH | TPY |
| | | |
| | | |
| | | |

**List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).**

See Appendix A

*Applicable Requirements*

**List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.**

**40 C.F.R. 63 Subpart ZZZZ**
440 C.F.R. § 63.6603 (a) and Table 2d (Line 9) – Oxidation Catalyst Operating Requirements

40 C.F.R. § 63.6605 – General Operating Requirements, must comply with all emission, operating, and work practice standards at all times.

40 C.F.R. § 63.6612(a) and Table 5 (Line 13) – Initial Compliance Demonstration Requirements, Initial Testing and CPMS for inlet catalyst temperature.

40 C.F.R. § 63.6625 (h) – Monitoring Requirements

40 C.F.R. § 63.6630(e) – Initial Compliance Requirements

40 C.F.R. § 63.6640 and Table 6 (Line 14) – Continuous Compliance Requirements, Conduct annual compliance demonstrations in accordance with 63.6640(c) and continuously monitor inlet catalyst temperature or interlock the engine to shut down if the 1350 F is exceeded

40 C.F.R. § 63.6645 – Notification Submittal Requirements

40 C.F.R. § 63.6650 – Reporting Submittal Requirements, Semiannual CO demonstration

40 C.F.R. § 63.6665 – General Requirements/Provisions

**45 C.S.R 13, Permit R13-2479C**
Condition 4.1.2 – Emission Limitations; Maximum emissions shall not exceed the following listed in the table below;

| *Pollutant* | *Maximum Hourly Emissions (lb/hr)* | *Maximum Annual Emissions (ton/yr)* |
|---|---|---|
| CO | 5.56 | 22.14 |
| $NO_X$ | 35.00 | 41.30 |
| $PM_{10}$ | 0.01 | 0.01 |
| $SO_2$ | 0.70 | 0.30 |
| VOC | 1.44 | 5.73 |
| Formaldehyde | 0.64 | 2.57 |
| Benzene | 0.01 | 0.02 |

Condition 4.1.5 – Fuel Usage Requirements; Quantity of Natural Gas consumed shall not exceed in any calendar month an average hourly rate of 12,197 scf/hr or 97,130,880 scf/yr on an annual basis

Condition 4.1.13 – SO2 Hourly Limitation; Shall be demonstrated by maintaining an average hourly total sulfur content of fuel gas at or less than 20 grains of S / 100 scf of fuel gas.

Condition 4.1.14 – SO2 Annual Limitation; Shall be demonstrated by maintaining an average total sulfur content of fuel gas at or less than 2 grains of S / 100 scf of fuel gas.

X Permit Shield

**For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)**

**40 C.F.R. 63 Subpart ZZZZ**
40 C.F.R. § 63.6603(a) and Table 2d (Line 9) – Install oxidation catalyst to reduce HAP emissions from the stationary RICE.

40 C.F.R. § 63.6612 and Table 5 (Line 13) – Conduct initial performance test or initial compliance demonstrations according to

Table 5 (Line 13) within 180 days of the compliance date of October 19, 2013. Initial compliance has been achieved once an initial compliance demonstration as specified in §63.6630(e) has been conducted to show that the average reduction of emissions of CO is 93 percent or more, or the average CO concentration is less than or equal to 47 ppmvd at 15 percent $O_2$ and have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b), or you have installed equipment to automatically shut down the engine if the catalyst inlet temperature exceeds 1350 °F.

40 C.F.R. § 63.6625 (h) – Minimize Idle Time during Startup to not exceed 30 Minutes

40 C.F.R. § 63.6630 (e)(1) – Initial compliance demonstration must consist of at least three (3) test runs.

40 C.F.R. § 63.6630 (e)(2) – During the initial demonstration each test run must be of at least 15 minute duration, except that each test conducted using the method in appendix A to this subpart must consist of at least one measurement cycle and include at least 2 minutes of test data phase measurement.

40 C.F.R. § 63.6640 and Table 6 (Line 14) – Install an Oxidation Catalyst and conduct annual compliance demonstrations as specified in §63.6640(c) to show that the average reduction of emissions of CO is 93 percent or more, or the average CO concentration is less than or equal to 47 ppmvd at 15 percent $O_2$ and either collect the catalyst inlet temperature data according to §63.6625(b), reducing these data to 4-hour rolling averages; and maintaining the 4-hour rolling averages within the limitation of greater than 450 °F and less than or equal to 1350 °F for the catalyst inlet temperature or immediately shut down the engine if the catalyst inlet temperature exceeds 1350 °F

40 C.F.R. § 63.6655 (a), (b), and (d) – Keep records of maintenance conducted and operating schedule on the RICE

**45 C.S.R 13, Permit R13-2479C**
Condition 4.3.2 – In order to demonstrate compliance with Conditions 4.1.13 and 4.1.14, sampling analyses for total sulfur shall be obtained. Records of total sulfur analyses shall be kept for a minimum five (5) years.

Condition 4.3.3 – Upon request to determine compliance with emission limitations set forth by this permit, tests shall be conducted in accordance with the methods set forth in 40 CFR 60, Appendix A.

Condition 4.3.4 – With regards to emission testing, the permittee shall submit a test protocol to the WVDEP-DAQ and it must be received no less than 30 days prior to date of testing. Permittee shall also submit a notification of the actual dates and times testing to be conducted at least 15 days prior to testing. Once testing is completed, results shall be submitted within 30 days of completion.

Condition 4.4.5 – Maintain accurate records of engine hours of operation, brake horsepower, and amount of natural gas consumed to prove compliance with Condition 4.1.5. Records of engine hours of operation shall be kept for a minimum of five (5) years.

**Are you in compliance with all applicable requirements for this emission unit?** X Yes _No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

# ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

| **Emission unit ID number:** | **Emission unit name:** | **List any control devices associated with this emission unit:** |
|---|---|---|
| 01603 | Reciprocating Engine/Integral Compressor | NA |

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**
2-cycle, lean burn

| **Manufacturer:** | **Model number:** | **Serial number:** |
|---|---|---|
| Clark | RA-6 | NA |

| **Construction date:** | **Installation date:** | **Modification date(s):** |
|---|---|---|
| NA | 1948 | NA |

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):** 600 hp

| **Maximum Hourly Throughput:** | **Maximum Annual Throughput:** | **Maximum Operating Schedule:** |
|---|---|---|
| NA | NA | 4,380 |

***Fuel Usage Data*** **(fill out all applicable fields)**

| **Does this emission unit combust fuel?** X Yes ___ No | **If yes, is it?** __ Indirect Fired X Direct Fired |
|---|---|
| **Maximum design heat input and/or maximum horsepower rating:** 600 hp | **Type and Btu/hr rating of burners:** 8,400 Btu/hp-hr |

**List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.**
Natural Gas 7,082 scf/hr / 28,312,320 scf/yr

**Describe each fuel expected to be used during the term of the permit.**

| Fuel Type | Max. Sulfur Content | Max. Ash Content | BTU Value |
|---|---|---|---|
| Natural Gas | Pipeline Quality | | 1,020 Btu/scf |
| | | | |
| | | | |
| | | | |

| ***Emissions Data*** | | |
|---|---|---|
| Criteria Pollutants | Potential Emissions | |
| | PPH | TPY |
| Carbon Monoxide (CO) | See Appendix A | |
| Nitrogen Oxides ($NO_X$) | | |
| Lead (Pb) | | |
| Particulate Matter ($PM_{2.5}$) | | |
| Particulate Matter ($PM_{10}$) | | |
| Total Particulate Matter (TSP) | | |
| Sulfur Dioxide ($SO_2$) | | |
| Volatile Organic Compounds (VOC) | | |
| Hazardous Air Pollutants | Potential Emissions | |
| | PPH | TPY |
| | See Appendix A | |
| | | |
| | | |
| | | |
| Regulated Pollutants other than Criteria and HAP | Potential Emissions | |
| | PPH | TPY |
| | | |
| | | |
| | | |

**List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).**

See Appendix A

*Applicable Requirements*

**List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.**

**40 C.F.R. 63 Subpart ZZZZ**
40 C.F.R. § 63.6603 (a) and Table 2d (Line 6) – Maintenance Requirements

40 C.F.R. § 63.6605 – Operating Requirements

40 C.F.R. § 63.6625 (e)(5), (h), and (j) – Monitoring Requirements

40 C.F.R. § 63.6640 and Table 6 (Line 9) – Continuous Compliance Requirements

40 C.F.R. § 63.6665 – General Requirements/Provisions

**45 C.S.R 13, Permit R13-2479C**
Condition 4.1.3 – Emission Limitations; Maximum emissions shall not exceed the following listed in the table below;

| *Pollutant* | *Maximum Hourly Emissions (lb/hr)* | *Maximum Annual Emissions (ton/yr)* |
|---|---|---|
| CO | 4.10 | 8.10 |
| $NO_X$ | 7.25 | 15.90 |
| $PM_{10}$ | 0.28 | 0.555 |
| $SO_2$ | 0.46 | 0.063 |
| VOC | 0.87 | 1.73 |
| Formaldehyde | 0.40 | 0.80 |
| Benzene | 0.01 | 0.03 |

Condition 4.1.4 – Hours of Operation Limitation; Engine hours shall be limited to 4,380 hours of operation per year.

Condition 4.1.6 – Fuel Usage Requirements; Quantity of Natural Gas consumed shall not exceed in any calendar month an average hourly rate of 7,260 scf/hr or 28,908,000 scf/yr on an annual basis.

Condition 4.1.13 – SO2 Hourly Limitation; Shall be demonstrated by maintaining an average hourly total sulfur content of fuel gas at or less than 20 grains of S / 100 scf of fuel gas.

Condition 4.1.14 – SO2 Annual Limitation; Shall be demonstrated by maintaining an average total sulfur content of fuel gas at or less than 2 grains of S / 100 scf of fuel gas.

X Permit Shield

**For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)**

**40 C.F.R. 63 Subpart ZZZZ**
40 C.F.R. § 63.6603(a) and Table 2d (Line 6) – Change oil and filter, inspect spark plugs, and inspect hoses and belts every 4,320 hours of operation, or annually whichever comes first and replace as necessary.

40 C.F.R. §§ 63.6605 & 63.6640 and Table 6 (Line 9) – Work or Management Practices: Operate and Maintain the RICE according to the manufacturer's instructions OR develop and follow your own maintenance plan

40 C.F.R. § 63.6625 (e)(5) – Operate and maintain the RICE according to the manufacturer's instructions OR develop and follow your own maintenance plan

40 C.F.R. § 63.6625 (h) – Minimize Idle Time during Startup to not exceed 30 Minutes

40 C.F.R. § 63.6625 (j) – Oil Analysis Program in lieu of Oil change requirement in Table 2d (Line 6)

40 C.F.R. § 63.6655 (a), (d), and (e) – Keep records of maintenance conducted and operating schedule on the RICE

**45 C.S.R 13, Permit R13-2479C**
Condition 4.3.2 – In order to demonstrate compliance with Conditions 4.1.13 and 4.1.14, sampling analyses for total sulfur shall be obtained. Records of total sulfur analyses shall be kept for a minimum five (5) years.

Condition 4.3.3 – Upon request to determine compliance with emission limitations set forth by this permit, tests shall be conducted in accordance with the methods set forth in 40 CFR 60, Appendix A.

Condition 4.3.4 – With regards to emission testing, the permittee shall submit a test protocol to the WVDEP-DAQ and it must be received no less than 30 days prior to date of testing. Permittee shall also submit a notification of the actual dates and times testing to be conducted at least 15 days prior to testing. Once testing is completed, results shall be submitted within 30 days of completion.

Condition 4.4.4 – Maintain accurate records of engine hours of operation to prove compliance with Condition 4.1.4. Records of engine hours of operation shall be kept for a minimum of five (5) years.

Condition 4.4.5 – Maintain accurate records of engine hours of operation, brake horsepower, and amount of natural gas consumed to prove compliance with Condition 4.1.6. Records of engine hours of operation shall be kept for a minimum of five (5) years.

**Are you in compliance with all applicable requirements for this emission unit?** X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

# ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

| **Emission unit ID number:** | **Emission unit name:** | **List any control devices associated with this emission unit:** |
|---|---|---|
| BLR1 | Dehydrator Reboiler | NA |

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**

Reboiler/regenerator

| **Manufacturer:** | **Model number:** | **Serial number:** |
|---|---|---|
| NATCO | SB24-18 | NA |
| **Construction date:** | **Installation date:** | **Modification date(s):** |
| NA | 1965 | NA |

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**

0.75 mmBtu/hr
1.25 mmBtu/hr (R13-2479C)

| **Maximum Hourly Throughput:** | **Maximum Annual Throughput:** | **Maximum Operating Schedule:** |
|---|---|---|
| NA | NA | 8,760 |

***Fuel Usage Data*** **(fill out all applicable fields)**

| **Does this emission unit combust fuel?** X Yes ___ No | **If yes, is it?** X Indirect Fired ___ Direct Fired |
|---|---|
| **Maximum design heat input and/or maximum horsepower rating:** 0.75 mmBtu/hr<br>1.25 mmBtu/hr (R13-2479C) | **Type and Btu/hr rating of burners:** 0.75 mmBtu/hr |

**List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.**

Natural Gas 730.6 scf/hr / 6,400,000 scf/yr

**Describe each fuel expected to be used during the term of the permit.**

| Fuel Type | Max. Sulfur Content | Max. Ash Content | BTU Value |
|---|---|---|---|
| Natural Gas | Pipeline Quality | | 1,000 Btu/scf |
| | | | |
| | | | |
| | | | |

| ***Emissions Data*** | | |
|---|---|---|
| Criteria Pollutants | Potential Emissions | |
| | PPH | TPY |
| Carbon Monoxide (CO) | See Appendix A | |
| Nitrogen Oxides ($NO_X$) | | |
| Lead (Pb) | | |
| Particulate Matter ($PM_{2.5}$) | | |
| Particulate Matter ($PM_{10}$) | | |
| Total Particulate Matter (TSP) | | |
| Sulfur Dioxide ($SO_2$) | | |
| Volatile Organic Compounds (VOC) | | |
| Hazardous Air Pollutants | Potential Emissions | |
| | PPH | TPY |
| | See Appendix A | |
| | | |
| | | |
| | | |
| Regulated Pollutants other than Criteria and HAP | Potential Emissions | |
| | PPH | TPY |
| | | |
| | | |
| | | |

**List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).**

See Appendix A

*Applicable Requirements*

**List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.**

45 CSR§2-3.1. – Opacity Limit; shall not exceed ten (10) percent opacity

X Permit Shield

**For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)**

45 CSR§2-3.2 – Compliance shall be determined using Method 9

**Are you in compliance with all applicable requirements for this emission unit?** X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

# ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

| **Emission unit ID number** | **Emission unit name:** | **List any control devices associated with this emission unit:** |
|---|---|---|
| FLLP1 | Dehydrator Flare | NA |

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**

TEG Dehydrator Flare

| **Manufacturer:** | **Model number:** | **Serial number:** |
|---|---|---|
| NATCO | SHV-2.5 | NA |
| **Construction date:** | **Installation date:** | **Modification date(s):** |
| NA | 1998 | NA |

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):** 1.00 mmBtu/hr

| **Maximum Hourly Throughput:** | **Maximum Annual Throughput:** | **Maximum Operating Schedule:** |
|---|---|---|
| NA | NA | 8,760 |

***Fuel Usage Data*** **(fill out all applicable fields)**

| **Does this emission unit combust fuel?** X Yes ___ No | **If yes, is it?** __ Indirect Fired X Direct Fired |
|---|---|
| **Maximum design heat input and/or maximum horsepower rating:** 1.00 mmBtu/hr | **Type and Btu/hr rating of burners:** 1.00 mmBtu/hr |

**List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.**

Natural Gas
980.4 scf/hr / 8,588,300 scf/yr

**Describe each fuel expected to be used during the term of the permit.**

| Fuel Type | Max. Sulfur Content | Max. Ash Content | BTU Value |
|---|---|---|---|
| Natural Gas | Pipeline Quality | | 1,020 Btu/scf |
| | | | |
| | | | |
| | | | |

| ***Emissions Data*** | | |
|---|---|---|
| Criteria Pollutants | Potential Emissions | |
| | PPH | TPY |
| Carbon Monoxide (CO) | See Appendix A | |
| Nitrogen Oxides ($NO_X$) | | |
| Lead (Pb) | | |
| Particulate Matter ($PM_{2.5}$) | | |
| Particulate Matter ($PM_{10}$) | | |
| Total Particulate Matter (TSP) | | |
| Sulfur Dioxide ($SO_2$) | | |
| Volatile Organic Compounds (VOC) | | |
| Hazardous Air Pollutants | Potential Emissions | |
| | PPH | TPY |
| | See Appendix A | |
| | | |
| | | |
| | | |
| Regulated Pollutants other than Criteria and HAP | Potential Emissions | |
| | PPH | TPY |
| | | |
| | | |
| | | |

**List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).**

See Appendix A

*Applicable Requirements*

**List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.**

**45 C.S.R. 6**
45 C.S.R. 6-4.3 – Opacity Limitations; No person shall cause or allow emission of smoke into atmosphere from FLLP1 which is 20% opacity or higher.

45 C.S.R. 6-4.5 – Refuse/Ash; No person shall cause, allow or permit the emission of particles of unburned or partially burned refuse or ash from the flare which are large enough to be individually distinguished in the open air.

45 C.S.R. 6-4.6 – Objectionable Odors; Flare shall be designed, operated, and maintained so as to prevent the emission of objectionable odors

**45 C.S.R. 30-12.7**
Flare shall be steam-assisted, air-assisted, or non-assisted.

Flare shall be designed and operated with no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

Flare shall be operated with a flame present at all times except during SSM.

Flare shall be designed to meet the Btu and exit velocity requirements in accordance with 63.11.

**45 C.S.R. 13, Permit R13-2479C**
Condition 4.1.7 – Flare Requirements; Flare shall be operated at all times when emissions may be vented to it.

Condition 4.1.8 – Flare Emission Requirements; Maximum emissions shall not exceed the following listed in the table below;

| ***Pollutant*** | ***Maximum Hourly Emissions (lb/hr)*** | ***Maximum Annual Emissions (ton/yr)*** |
|---|---|---|
| CO | 0.37 | 1.62 |
| $NO_X$ | 0.07 | 0.30 |
| $PM_{10}$ | 0.01 | 0.01 |
| $SO_2$ | 0.06 | 0.25 |
| VOC | 2.09 | 9.15 |
| Benzene | 0.68 | 2.99 |
| Toluene | 0.078 | 0.34 |
| Ethylbenzene | 0.031 | 0.14 |
| Hexane | 0.024 | 0.11 |
| Xylene | 0.15 | 0.66 |
| Total HAPs | 0.96 | 4.24 |

Condition 4.1.9 – Flare Requirements; Flare shall be operated so as to reduce HAP emissions by 95.0 percent by weight or more.

Condition 4.1.10 – Flare Requirements; Net heating value of gas being flared shall be 200 BTU/scf or greater.

<u>X</u> Permit Shield

**For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)**

**45 C.S.R. 30-5.1.c.**
To demonstrate compliance, presence or absence of a flare pilot flame shall be monitored

Method 22 Opacity testing shall be conducted within one year of permit issuance or initials startup, whichever is later

The Director may require a flare compliance assessment be conducted to demonstrate compliance

Maintain records of the times and duration of all periods in which the pilot flame was absent

Maintain a record of the flare design evaluation

Maintain records of the VE opacity testing conducted

Maintain records for a period of five years on site or an readily accessible off-site location

**45 C.S.R. 13, Permit R13-2479C**
Condition 4.2.1 – Flare's pilot flame shall be electronically monitored with spark recognition

Condition 4.4.2 – Permittee shall maintain accurate records of all required inspections and preventative maintenance procedures.

Condition 4.4.3 – Permittee shall maintain accurate records of the occurrence and duration of any malfunction or operational shutdown of the Flare in which excess emissions occur.

Condition 4.4.6 – Permittee shall record on a monthly basis all periods during which the pilot flame was lost, and operating times for the flare, pilot flame monitoring equipment, and the dehydrator.

**Are you in compliance with all applicable requirements for this emission unit?** X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

# ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

| **Emission unit ID number:** | **Emission unit name:** | **List any control devices associated with this emission unit:** |
|---|---|---|
| TEGDEHY1 | TEG Dehydrator | FLLP1 |

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**

Dehydrator

| **Manufacturer:** | **Model number:** | **Serial number:** |
|---|---|---|
| BS&B | NA | NA |

| **Construction date:** | **Installation date:** | **Modification date(s):** |
|---|---|---|
| NA | 1998 | NA |

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):** 35.1 mmscf/day

| **Maximum Hourly Throughput:** | **Maximum Annual Throughput:** | **Maximum Operating Schedule:** |
|---|---|---|
| 1.463 mmscf/hr | 12812 mmscf/yr | 8,760 |

***Fuel Usage Data*** **(fill out all applicable fields)**

| **Does this emission unit combust fuel?** ___Yes _X_ No | **If yes, is it?** __ Indirect Fired ___ Direct Fired |
|---|---|
| **Maximum design heat input and/or maximum horsepower rating:** NA | **Type and Btu/hr rating of burners:** NA |

**List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.**

NA

**Describe each fuel expected to be used during the term of the permit.**

| Fuel Type | Max. Sulfur Content | Max. Ash Content | BTU Value |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

| ***Emissions Data*** | | |
|---|---|---|
| Criteria Pollutants | Potential Emissions | |
| | PPH | TPY |
| Carbon Monoxide (CO) | See Appendix A | |
| Nitrogen Oxides ($NO_X$) | | |
| Lead (Pb) | | |
| Particulate Matter ($PM_{2.5}$) | | |
| Particulate Matter ($PM_{10}$) | | |
| Total Particulate Matter (TSP) | | |
| Sulfur Dioxide ($SO_2$) | | |
| Volatile Organic Compounds (VOC) | | |
| Hazardous Air Pollutants | Potential Emissions | |
| | PPH | TPY |
| | See Appendix A | |
| | | |
| | | |
| | | |
| Regulated Pollutants other than Criteria and HAP | Potential Emissions | |
| | PPH | TPY |
| | | |
| | | |
| | | |

**List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).**

See Appendix A

*Applicable Requirements*

**List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.**

**40 C.F.R. 63 Subpart HH**
40 C.F.R. § 63.764 (e)(1)(ii) – Less than one (1) ton of Benzene Exemption

40 C.F.R. § 63.772 – Compliance Procedures

40 C.F.R. § 63.774 – Recordkeeping Requirements

40 C.F.R. § 63.775 – Reporting Requirements

**45 C.S.R. 30-12.7**
Flare shall be steam-assisted, air-assisted, or non-assisted.

Flare shall be designed and operated with no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

Flare shall be operated with a flame present at all times except during SSM.

Flare shall be designed to meet the Btu and exit velocity requirements in accordance with 63.11.

**45 C.S.R. 13, Permit R13-2479C**
Condition 4.1.17 – Permittee shall, to the extent practicable, install, maintain, and operate FLLP1 in a manner consistent with safety and good air pollution control practices for minimizing emissions or comply with more stringent limits set forth by any State rule, federal regulation or alternative control plan approved by the Secretary.

<u>X</u> Permit Shield

**For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)**

**40 C.F.R. 63 Subpart HH**
40 C.F.R. § 63.772(b)(2) – Permittee shall determine actual average Benzene emissions by using GRI-GLYCalc Version 3.0 or higher or by determining an average mass rate of benzene emissions in kg/hr through direct measurement.

40 C.F.R. § 63.774(d)(i) – Maintain records of actual average Benzene emissions

40 C.F.R. § 63.775(c)(8) – TEG Units located at an area source meeting the criteria found in 63.764(e)(1)(ii) are exempt from the reporting requirement

45 C.S.R. 30-5.1.c.
To demonstrate compliance, presence or absence of a flare pilot flame shall be monitored

Method 22 Opacity testing shall be conducted within one year of permit issuance or initials startup, whichever is later

The Director may require a flare compliance assessment be conducted to demonstrate compliance

Maintain records of the times and duration of all periods in which the pilot flame was absent

Maintain a record of the flare design evaluation

Maintain records of the VE opacity testing conducted

Maintain records of the wet natural gas throughput through the dehydration system

Maintain monthly hours of operation records for the dehydration unit

Maintain records for a period of five years on site or an readily accessible off-site location

**45 C.S.R. 13, Permit R13-2479C**
Condition 4.4.2 – Permittee shall maintain accurate records of all required inspections and preventative maintenance procedures.

Condition 4.4.3 – Permittee shall maintain accurate records of the occurrence and duration of any malfunction or operational shutdown of the Flare in which excess emissions occur.

Condition 4.4.6 – Permittee shall record on a monthly basis a all periods during which the pilot flame was lost, and operating times for the flare, pilot flame monitoring equipment, and the dehydrator.

**Are you in compliance with all applicable requirements for this emission unit?** X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

# ATTACHMENT F

# SCHEDULE OF COMPLIANCE FORM (NOT APPLICABLE)

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017

# ATTACHMENT G

# AIR POLLUTION CONTROL DEVICE FORM

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017

## ATTACHMENT G - Air Pollution Control Device Form

| **Control device ID number:** C1 | **List all emission units associated with this control device.** 01601 | |
|---|---|---|
| **Manufacturer:** DCL International | **Model number:** DC68-20 BMHGS | **Installation date:** 2013 |

**Type of Air Pollution Control Device:**

___ Baghouse/Fabric Filter ___ Venturi Scrubber ___ Multiclone

___ Carbon Bed Adsorber ___ Packed Tower Scrubber ___ Single Cyclone

___ Carbon Drum(s) ___ Other Wet Scrubber ___ Cyclone Bank

___ Catalytic Incinerator ___ Condenser ___ Settling Chamber

___ Thermal Incinerator ___ Flare X Other (describe) Oxidation Catalyst

___ Wet Plate Electrostatic Precipitator ___ Dry Plate Electrostatic Precipitator

**List the pollutants for which this device is intended to control and the capture and control efficiencies.**

| Pollutant | Capture Efficiency | Control Efficiency |
|---|---|---|
| CO | 93% | 93% |
| | | |

**Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).**

Exhaust Flow Rate: 8,400 acfm
Exhaust Catalytic Inlet Temperature: 750 F

Stack Dimensions: 20" x 276.32"
20 inch diameter
23 ft combined height on top of vertical silencer

**Is this device subject to the CAM requirements of 40 C.F.R. 64?** ___ Yes X No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

Exempt from CAM because of CAAA 112 applicability under 40CFR63, Subpart ZZZZ

**Describe the parameters monitored and/or methods used to indicate performance of this control device.**

Conduct initial compliance demonstration within 180 days of the compliance date of October 19, 2013. Initial compliance has been achieved once an initial compliance demonstration, as specified in §63.6630(e) has been conducted to show that the average reduction of CO is 93 percent or more or have reduced CO emissions to an exhaust stack concentration of no more than 47 $ppm_{vd}$ @ 15% O2. Additionally, initial compliance will be demonstrated when the source has installed a CPMS to continuously monitor catalyst inlet temperature, or the source has installed equipment to automatically shut down the engine if the catalyst inlet temperature exceeds 1350 °F.

The initial compliance demonstration must consist of at least three (3) – 15 minute test runs.

Each test run must be of at least 15 minute duration, except that each test conducted using the method in appendix A to this subpart must consist of at least one measurement cycle and include at least 2 minutes of test data phase measurement.

## ATTACHMENT G - Air Pollution Control Device Form

| **Control device ID number:** C2 | **List all emission units associated with this control device.** 01602 | |
|---|---|---|
| **Manufacturer:** DCL International | **Model number:** DC68-20 BMHGS | **Installation date:** 2013 |

**Type of Air Pollution Control Device:**

___ Baghouse/Fabric Filter ___ Venturi Scrubber ___ Multiclone

___ Carbon Bed Adsorber ___ Packed Tower Scrubber ___ Single Cyclone

___ Carbon Drum(s) ___ Other Wet Scrubber ___ Cyclone Bank

___ Catalytic Incinerator ___ Condenser ___ Settling Chamber

___ Thermal Incinerator ___ Flare X Other (describe) Oxidation Catalyst

___ Wet Plate Electrostatic Precipitator ___ Dry Plate Electrostatic Precipitator

**List the pollutants for which this device is intended to control and the capture and control efficiencies.**

| Pollutant | Capture Efficiency | Control Efficiency |
|---|---|---|
| CO | 93% | 93% |
| | | |

**Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).**

Exhaust Flow Rate: 8,400 acfm
Exhaust Catalytic Inlet Temperature: 750 F

Stack Dimensions: 20" x 276.32"
20 inch diameter
23 ft combined height on top of vertical silencer

**Is this device subject to the CAM requirements of 40 C.F.R. 64?** ___ Yes X No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

Exempt from CAM because of CAAA 112 applicability under 40CFR63, Subpart ZZZZ

**Describe the parameters monitored and/or methods used to indicate performance of this control device.**

Conduct initial compliance demonstration within 180 days of the compliance date of October 19, 2013. Initial compliance has been achieved once an initial compliance demonstration, as specified in §63.6630(e) has been conducted to show that the average reduction of CO is 93 percent or more or have reduced CO emissions to an exhaust stack concentration of no more than 47 $ppm_{vd}$ @ 15% O2. Additionally, initial compliance will be demonstrated when the source has installed a CPMS to continuously monitor catalyst inlet temperature, or the source has installed equipment to automatically shut down the engine if the catalyst inlet temperature exceeds 1350 °F.

The initial compliance demonstration must consist of at least three (3) – 15 minute test runs.

Each test run must be of at least 15 minute duration, except that each test conducted using the method in appendix A to this subpart must consist of at least one measurement cycle and include at least 2 minutes of test data phase measurement.

# ATTACHMENT G - Air Pollution Control Device Form

| **Control device ID number:** FLLP1 | **List all emission units associated with this control device.** TEGDEHY1 | |
|---|---|---|
| **Manufacturer:** NATCO | **Model number:** SHV-2.5 | **Installation date:** 01/01/1998 |

**Type of Air Pollution Control Device:**

| | | |
|---|---|---|
| ___ Baghouse/Fabric Filter | ___ Venturi Scrubber | ___ Multiclone |
| ___ Carbon Bed Adsorber | ___ Packed Tower Scrubber | ___ Single Cyclone |
| ___ Carbon Drum(s) | ___ Other Wet Scrubber | ___ Cyclone Bank |
| ___ Catalytic Incinerator | ___ Condenser | ___ Settling Chamber |
| ___ Thermal Incinerator | X Flare | ___ Other (describe) _____ |
| ___ Wet Plate Electrostatic Precipitator | | ___ Dry Plate Electrostatic Precipitator |

**List the pollutants for which this device is intended to control and the capture and control efficiencies.**

| Pollutant | Capture Efficiency | Control Efficiency |
|---|---|---|
| Flare controls emissions from glycol dehydrators at 95%; See Appendix A for pollutants controlled. | | |
| VOC | 100% | 95% |
| HAPs | 100% | 95% |
| | | |

**Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).**

Design Capacity – 1.0 mmBtu/hr
Maximum Flow Rate – 980.4 scf/hr / 8,588,300 scf/yr

**Is this device subject to the CAM requirements of 40 C.F.R. 64?** ___ Yes X No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**
This unit is subject to 40 CFR 63 Subpart HH and therefore meets the exemption criteria of 40 CFR 64.2(b)(1)

**Describe the parameters monitored and/or methods used to indicate performance of this control device.**

Flare Design Analysis to show compliance with 63.11(b) tip velocity and waste gas Btu values.

A thermocouple continuously monitors and records the presence of a pilot flame.

Opacity VE's are measured and recorded to comply with the no visible emission requirements exceeding 5 minutes in any 2 hour period in accordance with 63.11(b).

# ATTACHMENT H

# COMPLIANCE ASSURANCE MONITORING FORM (NOT APPLICABLE)

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017

# APPENDIX A

# SUPPORTING CALCULATIONS

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017

**Table 1. Annual Potential To Emit (PTE) Summary**
**Columbia Gas Transmission - Hubball Compressor Station**

***Criteria Pollutants***

**Proposed PTE - Criteria Pollutants**

| Source | PM | PM10 | PM2.5 | SO2 | NOx | CO | VOC | CO2e |
|---|---|---|---|---|---|---|---|---|
| Engines (ton/yr) | 0.579 | 0.579 | 0.579 | 0.611 | 103.363 | 70.053 | 13.321 | 14851.903 |
| Heaters/Boilers/Reboilers (ton/yr) | 0.006 | 0.006 | 0.006 | 0.018 | 0.322 | 0.271 | 0.018 | 384.378 |
| Dehydration Unit (ton/yr) | - | - | - | - | - | - | 8.188 | 124.405 |
| Flare (ton/yr) | - | - | - | 0.245 | 0.298 | 1.621 | 2.497 | 512.505 |
| Storage Tanks (ton/yr) | - | - | - | - | - | - | 2.884 | - |
| Fugitives (ton/yr) | - | - | - | - | - | - | 0.865 | 20.108 |
| **Total Emissions (ton/yr)** | 0.586 | 0.586 | 0.586 | 0.874 | 103.983 | 71.944 | 25.275 | 15893.300 |
| **Total Emissions (lb/hr)** | 0.134 | 0.134 | 0.134 | 0.200 | 23.740 | 16.426 | 5.771 | 3628.607 |

Note: the VOC total did not include the flare contribution since they were already accounted for within the Dehydration unit VOC totals from GRI GLYCalc 95% Control

***Hazardous Air Pollutants (HAPs)***

**Proposed PTE - HAPs**

| Source | Acetaldehyde | Benzene | Toluene | Ethylbenzene | Xylene | n-Hexane | Formaldehyde | Total HAPs |
|---|---|---|---|---|---|---|---|---|
| Engines (ton/yr) | 0.9266 | 0.0722 | 0.0540 | 0.0054 | 0.0219 | 0.1142 | 5.944 | 8.350 |
| Heaters/Boilers/Reboilers (ton/yr) | - | 0.0000 | 0.0000 | - | - | 0.0058 | 0.000 | 0.006 |
| Dehydration Unit (ton/yr) | - | 0.2195 | 0.3613 | 0.0759 | 0.6414 | 0.1887 | - | 1.487 |
| Flare (ton/yr) | - | - | - | - | - | - | - | 0.000 |
| Storage Tanks (ton/yr) | - | - | - | - | - | - | - | 0.000 |
| Fugitives (ton/yr) | - | - | - | - | - | - | - | 0.000 |
| **Total Emissions (ton/yr)** | 0.927 | 0.292 | 0.415 | 0.081 | 0.663 | 0.309 | 5.945 | 9.843 |
| **Total Emissions (lb/hr)** | 0.212 | 0.067 | 0.095 | 0.019 | 0.151 | 0.070 | 1.357 | 2.247 |

**Table 2. Reciprocating Engine / Integral Compressor Emissions (E01 - E02)**
**Ingersoll-Rand 48KVS; 4SLB**
**Columbia Gas Transmission - Hubball Compressor Station**

| Pollutant | Maximum Hourly Emissions | | | | Annual Emissions | | | |
|---|---|---|---|---|---|---|---|---|
| | Emission Factor | | PTE per Engine (lb/hr) | | Emission Factor | | PTE per Engine (tons/yr) | |
| **Criteria Pollutants** | | | | | | | | |
| PM/PM10/PM2.5 | 7.71E-05 lb/MMBtu | (1) | 0.001 | (a) | 7.71E-05 lb/MMBtu | (1) | 0.004 | (d) |
| $SO_2$ | 20 grains S / 100 $ft^3$ | (2) | 0.68 | (f) | 2.0 grains S / 100 $ft^3$ | (3) | 0.27 | (g) |
| NOx | 1.20E+01 g/hp-hr | (4) | 34.92 | (b) | 6.50E-03 lb/hp-hr | (5) | 41.34 | (e) |
| CO | 3.83E-03 lb/hp-hr | (5) | 5.56 | (c) | 3.83E-03 lb/hp-hr | (5) | 22.14 | (e) |
| VOC | 1.18E-01 lb/MMBtu | (1) | 1.44 | (a) | 1.18E-01 lb/MMBtu | (1) | 5.73 | (d) |
| **Hazardous Air Pollutants** | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | 4.00E-05 lb/MMBtu | (1) | 0.000 | (a) | 4.00E-05 lb/MMBtu | (1) | 0.002 | (d) |
| 1,1,2-Trichloroethane | 3.18E-05 lb/MMBtu | (1) | 0.000 | (a) | 3.18E-05 lb/MMBtu | (1) | 0.002 | (d) |
| 1,3-Butadiene | 2.67E-04 lb/MMBtu | (1) | 0.003 | (a) | 2.67E-04 lb/MMBtu | (1) | 0.013 | (d) |
| 1,3-Dichloropropene | 2.64E-05 lb/MMBtu | (1) | 0.000 | (a) | 2.64E-05 lb/MMBtu | (1) | 0.001 | (d) |
| 2-Methylnappthalene | 3.32E-05 lb/MMBtu | (1) | 0.000 | (a) | 3.32E-05 lb/MMBtu | (1) | 0.002 | (d) |
| 2,2,4-Trimethylpentane | 2.50E-05 lb/MMBtu | (1) | 0.000 | (a) | 2.50E-05 lb/MMBtu | (1) | 0.001 | (d) |
| Acetaldehyde | 8.36E-03 lb/MMBtu | (1) | 0.102 | (a) | 8.36E-03 lb/MMBtu | (1) | 0.406 | (d) |
| Acrolein | 5.14E-03 lb/MMBtu | (1) | 0.063 | (a) | 5.14E-03 lb/MMBtu | (1) | 0.250 | (d) |
| Benzene | 4.40E-04 lb/MMBtu | (1) | 0.005 | (a) | 4.40E-04 lb/MMBtu | (1) | 0.021 | (d) |
| Biphenyl | 2.12E-03 lb/MMBtu | (1) | 0.026 | (a) | 2.12E-03 lb/MMBtu | (1) | 0.103 | (d) |
| Carbon Tetrachloride | 3.67E-05 lb/MMBtu | (1) | 0.000 | (a) | 3.67E-05 lb/MMBtu | (1) | 0.002 | (d) |
| Chlorobenzene | 3.04E-05 lb/MMBtu | (1) | 0.000 | (a) | 3.04E-05 lb/MMBtu | (1) | 0.001 | (d) |
| Chloroform | 2.85E-05 lb/MMBtu | (1) | 0.000 | (a) | 2.85E-05 lb/MMBtu | (1) | 0.001 | (d) |
| Ethylbenzene | 3.97E-05 lb/MMBtu | (1) | 0.000 | (a) | 3.97E-05 lb/MMBtu | (1) | 0.002 | (d) |
| Ethylene Dibromide | 4.43E-05 lb/MMBtu | (1) | 0.001 | (a) | 4.43E-05 lb/MMBtu | (1) | 0.002 | (d) |
| Formaldehyde | 5.28E-02 lb/MMBtu | (1) | 0.644 | (a) | 5.28E-02 lb/MMBtu | (1) | 2.564 | (d) |
| Methanol | 2.50E-03 lb/MMBtu | (1) | 0.030 | (a) | 2.50E-03 lb/MMBtu | (1) | 0.121 | (d) |
| Methylene Chloride | 2.00E-05 lb/MMBtu | (1) | 0.000 | (a) | 2.00E-05 lb/MMBtu | (1) | 0.001 | (d) |
| n-Hexane | 1.11E-03 lb/MMBtu | (1) | 0.014 | (a) | 1.11E-03 lb/MMBtu | (1) | 0.054 | (d) |
| Naphthalene | 7.44E-05 lb/MMBtu | (1) | 0.001 | (a) | 7.44E-05 lb/MMBtu | (1) | 0.004 | (d) |
| PAH (POM) | 2.69E-05 lb/MMBtu | (1) | 0.000 | (a) | 2.69E-05 lb/MMBtu | (1) | 0.001 | (d) |
| Phenol | 1.04E-05 lb/MMBtu | (1) | 0.000 | (a) | 1.04E-05 lb/MMBtu | (1) | 0.001 | (d) |
| Styrene | 2.36E-05 lb/MMBtu | (1) | 0.000 | (a) | 2.36E-05 lb/MMBtu | (1) | 0.001 | (d) |
| Toluene | 4.08E-04 lb/MMBtu | (1) | 0.005 | (a) | 4.08E-04 lb/MMBtu | (1) | 0.020 | (d) |
| Vinyl Chloride | 1.49E-05 lb/MMBtu | (1) | 0.000 | (a) | 1.49E-05 lb/MMBtu | (1) | 0.001 | (d) |
| Xylenes | 1.84E-04 lb/MMBtu | (1) | 0.002 | (a) | 1.84E-04 lb/MMBtu | (1) | 0.009 | (d) |
| **Total HAP** | | | **0.901** | | | | **3.586** | |
| **Greenhouse Gas Emissions** | | | | | | | | |
| $CO_2$ | 116.89 lb/MMBtu | (6) | 1425.67 | (a) | 116.89 lb/MMBtu | (6) | 5676.77 | (d) |
| $CH_4$ | 2.2E-03 lb/MMBtu | (6) | 0.03 | (a) | 2.2E-03 lb/MMBtu | (6) | 0.11 | (d) |
| $N_2O$ | 2.2E-04 lb/MMBtu | (6) | 0.00 | (a) | 2.2E-04 lb/MMBtu | (6) | 0.01 | (d) |
| $CO_2e^{(h)}$ | - - | | 1427.15 | | | | 5682.64 | |

**Calculations:**

**Maximum Hourly Emissions - If emission factor note 1 or 6 is used, use calculation (a). If emission factor note 4 is used, use calculation (b) and if emisison factor note 5 is used, use calculation (c).**

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

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

(c) Maximum Hourly Emissions (lb/hr) = Emission factor (lb/hp-hr) * Engine Power Output (hp)

**Annual Emissions - If emission factor note 1 or 6 is used, use calculation (d). If emission factor note 5 is used, use calculation (e).**

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

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

**$SO_2$ Emissions - If emission factor note 2 is used, use calculation (f) for hourly emissions and if emission factor 3 is used, use calculation (g) for annual emissions.**

(f) Maximum Hourly Emissions SO2 Caclulation (lb/hr) = (20 grain S/100ft3) * Fuel throughput (ft3/hr) * (1lb/7000 grains) * (lbmol S/32.06 lb S) * (lbmol SO2/ lbmol S) *(64.07 lb SO2/lbmol SO2)

(g) Annual Emissions SO2 Caclulation (ton/yr) = (2.0 grain S/100ft3) * Fuel throughput (ft3/hr) * (1lb/7000 grains) * (lbmol S/32.06 lb S) * (lbmol SO2/ lbmol S) *(64.07 lb SO2/lbmol SO2) * Annual hours of operation (hr/yr) * (1ton/2000lbs)

| MAXIMUM HOURLY EMISSION INPUTS | | |
|---|---|---|
| Engine Power Output (kW) = | 1083 | |
| Engine Power Output (hp) = | 1,452 | |
| Number of Engines = | 2 | |
| Average BSFC (BTU/HP-hr) = | 8,400 | (5) |
| Heat Content Natural Gas(Btu/scf) = | 1,020.0 | (6) |
| Fuel Throughput (ft3/hr) = | 11,957.6 | (7) |
| PTE Hours of Operation = | 1 | |

| ANNUAL EMISSION INPUTS | | |
|---|---|---|
| Engine Power Output (kW) = | 984 | |
| Engine Power Output (hp) = | 1,320 | |
| Number of Engines = | 2 | |
| Average BSFC (BTU/HP-hr) = | 8,400 | (5) |
| Heat Content Natural Gas(Btu/scf) = | 1,020.0 | (6) |
| Fuel Throughput (ft3/hr) = | 10,870.6 | (7) |
| PTE Hours of Operation = | 8,760 | |

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

Global Warming Potential (GWP)

| | | |
|---|---|---|
| $CO_2$ | 1 | (8) |
| $CH_4$ | 25 | (8) |
| $N_2O$ | 298 | (8) |

**Notes:**

(1) AP-42, Chapter 3.2, Table 3.2-2. *Natural Gas-fired Reciprocating Engines* (7/00). Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines.

(2) 45 CSR 13, Permit R13-2479C, Condition 4.1.13

(3) 45 CSR 13, Permit R13-2479C, Condition 4.1.14

(4) Emission Factor supplied from turbocharger manufacturer

(5) Emission Factor supplied from performance tests conducted 11/02

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

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

(8) Value obtained from AP-42, Chapter 3.2, Table 3.2-1, footnote b

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

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

**Table 3. Reciprocating Engine / Integral Compressor Emissions (E03)**
**Clark RA-6; 2SLB**
**Columbia Gas Transmission - Hubball Compressor Station**

| Pollutant | Maximum Hourly Emissions | | | | | Annual Emissions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Emission Factor | | | PTE per Engine (lb/hr) | | Emission Factor | | | PTE per Engine (tons/yr) | |
| **Criteria Pollutants** | | | | | | | | | | |
| PM/PM10/PM2.5 | 3.84E-02 | lb/MMBtu | (1) | 0.28 | (a) | 3.84E-02 | lb/MMBtu | (1) | 0.555 | (c) |
| $SO_2$ | 20 grains S / 100 $ft^3$ | | (2) | 0.40 | (e) | 2.0 grains S / 100 $ft^3$ | | (3) | 0.06 | (f) |
| NOx | - - | | (4) | 7.25 | (b) | - - | | (4) | 15.90 | (d) |
| CO | 6.17E-03 | lb/hp-hr | (5) | 4.10 | (b) | 6.17E-03 | lb/hp-hr | (6) | 8.11 | (d) |
| VOC | 1.20E-01 | lb/MMBtu | (1) | 0.867 | (a) | 1.20E-01 | lb/MMBtu | (1) | 1.73 | (c) |
| **Hazardous Air Pollutants** | | | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | 6.63E-05 | lb/MMBtu | (1) | 0.000 | (a) | 6.63E-05 | lb/MMBtu | (1) | 0.001 | (c) |
| 1,1,2-Trichloroethane | 5.27E-05 | lb/MMBtu | (1) | 0.000 | (a) | 5.27E-05 | lb/MMBtu | (1) | 0.001 | (c) |
| 1,3-Butadiene | 8.20E-04 | lb/MMBtu | (1) | 0.006 | (a) | 8.20E-04 | lb/MMBtu | (1) | 0.012 | (c) |
| 1,3-Dichloropropene | 4.38E-05 | lb/MMBtu | (1) | 0.000 | (a) | 4.38E-05 | lb/MMBtu | (1) | 0.001 | (c) |
| 2-Methylnappthalene | 2.14E-05 | lb/MMBtu | (1) | 0.000 | (a) | 2.14E-05 | lb/MMBtu | (1) | 0.000 | (c) |
| 2,2,4-Trimethylpentane | 8.46E-04 | lb/MMBtu | (1) | 0.006 | (a) | 8.46E-04 | lb/MMBtu | (1) | 0.012 | (c) |
| Acetaldehyde | 7.76E-03 | lb/MMBtu | (1) | 0.056 | (a) | 7.76E-03 | lb/MMBtu | (1) | 0.112 | (c) |
| Acrolein | 7.78E-03 | lb/MMBtu | (1) | 0.056 | (a) | 7.78E-03 | lb/MMBtu | (1) | 0.112 | (c) |
| Benzene | 1.94E-03 | lb/MMBtu | (1) | 0.014 | (a) | 1.94E-03 | lb/MMBtu | (1) | 0.028 | (c) |
| Biphenyl | 3.95E-06 | lb/MMBtu | (1) | 0.000 | (a) | 3.95E-06 | lb/MMBtu | (1) | 0.000 | (c) |
| Carbon Tetrachloride | 6.07E-05 | lb/MMBtu | (1) | 0.000 | (a) | 6.07E-05 | lb/MMBtu | (1) | 0.001 | (c) |
| Chlorobenzene | 4.44E-05 | lb/MMBtu | (1) | 0.000 | (a) | 4.44E-05 | lb/MMBtu | (1) | 0.001 | (c) |
| Chloroform | 4.71E-05 | lb/MMBtu | (1) | 0.000 | (a) | 4.71E-05 | lb/MMBtu | (1) | 0.001 | (c) |
| Ethylbenzene | 1.08E-04 | lb/MMBtu | (1) | 0.001 | (a) | 1.08E-04 | lb/MMBtu | (1) | 0.002 | (c) |
| Ethylene Dibromide | 7.34E-05 | lb/MMBtu | (1) | 0.001 | (a) | 7.34E-05 | lb/MMBtu | (1) | 0.001 | (c) |
| Formaldehyde | 5.52E-02 | lb/MMBtu | (1) | 0.399 | (a) | 5.52E-02 | lb/MMBtu | (1) | 0.797 | (c) |
| Methanol | 2.48E-03 | lb/MMBtu | (1) | 0.018 | (a) | 2.48E-03 | lb/MMBtu | (1) | 0.036 | (c) |
| Methylene Chloride | 1.47E-04 | lb/MMBtu | (1) | 0.001 | (a) | 1.47E-04 | lb/MMBtu | (1) | 0.002 | (c) |
| n-Hexane | 4.45E-04 | lb/MMBtu | (1) | 0.003 | (a) | 4.45E-04 | lb/MMBtu | (1) | 0.006 | (c) |
| Naphthalene | 9.63E-05 | lb/MMBtu | (1) | 0.001 | (a) | 9.63E-05 | lb/MMBtu | (1) | 0.001 | (c) |
| PAH (POM) | 1.34E-04 | lb/MMBtu | (1) | 0.001 | (a) | 1.34E-04 | lb/MMBtu | (1) | 0.002 | (c) |
| Phenol | 4.21E-05 | lb/MMBtu | (1) | 0.000 | (a) | 4.21E-05 | lb/MMBtu | (1) | 0.001 | (c) |
| Styrene | 5.48E-05 | lb/MMBtu | (1) | 0.000 | (a) | 5.48E-05 | lb/MMBtu | (1) | 0.001 | (c) |
| Toluene | 9.63E-04 | lb/MMBtu | (1) | 0.007 | (a) | 9.63E-04 | lb/MMBtu | (1) | 0.014 | (c) |
| Vinyl Chloride | 2.47E-05 | lb/MMBtu | (1) | 0.000 | (a) | 2.47E-05 | lb/MMBtu | (1) | 0.000 | (c) |
| Xylenes | 2.68E-04 | lb/MMBtu | (1) | 0.002 | (a) | 2.68E-04 | lb/MMBtu | (1) | 0.004 | (c) |
| **Total HAP** | | | | **0.574** | | | | | **1.148** | |
| **Greenhouse Gas Emissions** | | | | | | | | | | |
| $CO_2$ | 116.89 | lb/MMBtu | (7) | 844.41 | (a) | 116.89 | lb/MMBtu | (7) | 3375.96 | (c) |
| $CH_4$ | 2.2E-03 | lb/MMBtu | (7) | 0.02 | (a) | 2.2E-03 | lb/MMBtu | (7) | 0.06 | (c) |
| $N_2O$ | 2.2E-04 | lb/MMBtu | (7) | 0.00 | (a) | 2.2E-04 | lb/MMBtu | (7) | 0.01 | (c) |
| $CO_2e$[(g)] | - | - | | 845.28 | | | | | 3379.45 | |

**Calculations:**

**Maximum Hourly Emissions - If emission factor note 1 or 4 is used, use calculation (a). If emission factor note 3 is used, use calculation (b).**

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

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

**Annual Emissions - If emission factor note 1 or 4 is used, use calculation (c). If emission factor note 3 is used, use calculation (d).**

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

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

**$SO_2$ Emissions - If emission factor note 2 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.**

(e) Maximum Hourly Emissions SO2 Caclulation (lb/hr) = (20 grain S/100ft3) * Fuel throughput (ft3/hr) * (1lb/7000 grains) * (lbmol S/32.06 lb S) * (lbmol SO2/ lbmol S) *(64.07 lb SO2/lbmol SO2)

(f) Annual Emissions SO2 Caclulation (ton/yr) = (0.25 grain S/100ft3) * Fuel throughput (ft3/hr) * (1lb/7000 grains) * (lbmol S/32.06 lb S) * (lbmol SO2/ lbmol S) *(64.07 lb SO2/lbmol SO2) * Annual hours of operation (hr/yr) * (1ton/2000lbs)

| MAXIMUM HOURLY EMISSION INPUTS | | |
|---|---|---|
| Engine Power Output (kW) = | 641 | |
| Engine Power Output (hp) = | 860 | |
| Number of Engines = | 1 | |
| Average BSFC (BTU/HP-hr) = | 8,400 | (8) |
| Heat Content Natural Gas(Btu/scf) = | 1,020.0 | (9) |
| Fuel Throughput (ft3/hr) = | 7,082.4 | (10) |
| PTE Hours of Operation = | 1 | |

| ANNUAL EMISSION INPUTS | | |
|---|---|---|
| Engine Power Output (kW) = | 585 | |
| Engine Power Output (hp) = | 785 | |
| Number of Engines = | 1 | |
| Average BSFC (BTU/HP-hr) = | 8,400 | (8) |
| Heat Content Natural Gas(Btu/scf) = | 1,020.0 | (9) |
| Fuel Throughput (ft3/hr) = | 6,464.7 | (10) |
| PTE Hours of Operation = | 4,380 | |

(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 | (11) |
| $CH_4$ | 25 | (11) |
| $N_2O$ | 298 | (11) |

**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) 45 CSR 13, Permit R13-2479C, Condition 4.1.13

(3) 45 CSR 13, Permit R13-2479C, Condition 4.1.14

(4) Emissions calculated from Air Dispersion Modeling Analysis (2/02)

(5) Emission factor derived from Stack Test data with engine running @ 660 hp (11/02)

(6) Emission factor derived from Stack Test data with engine running @ 600 hp (11/02)

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

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

(9) Value obtained from AP-42, Chapter 3.2, Table 3.2-1, footnote b

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

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

**Table 4. Reciprocating Engine / Generator Emissions (G2)**
**Waukesha F11GSI; 4SRB**
**Columbia Gas Transmission - Hubball Compressor Station**

| Pollutant | Emission Factor | | Safety Factor / Multiplier (1) | PTE (lb/hr) | | PTE (ton/yr) | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Criteria Pollutants** | | | | | | | |
| PM/PM10/PM2.5** | 9.50E-03 lb/MMBtu | (2) | 2 | 0.035 | (a) | 0.017 | (b) |
| $SO_2$ (Hourly) | 20 grains S / 100 $ft^2$ | (3) | 1 | 0.10 | (e) | | |
| $SO_2$ (Annual) | 2.0 grains S / 100 $ft^3$ | (3) | 1 | - | | 0.01 | (f) |
| $NO_x$** | 2.09E-02 lb/hp-hr | (4) | 2 | 9.57 | (c) | 4.79 | (d) |
| CO** | 7.71E-02 lb/hp-hr | (4) | 2 | 35.31 | (c) | 17.66 | (d) |
| VOC** | 5.51E-04 lb/hp-hr | (4) | 2 | 0.25 | (c) | 0.13 | (d) |
| | | | | | | | |
| **Hazardous Air Pollutants** | | | | | | | |
| 1,1,2,2-Tetrachloroethane | 2.53E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| 1,1,2-Trichloroethane | 1.53E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| 1,3-Butadiene | 6.63E-04 lb/MMBtu | (2) | | 0.001 | (a) | 0.001 | (b) |
| 1,3-Dichloropropene | 1.27E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| Acetaldehyde | 2.79E-03 lb/MMBtu | (2) | | 0.005 | (a) | 0.003 | (b) |
| Acrolein | 2.63E-03 lb/MMBtu | (2) | | 0.005 | (a) | 0.002 | (b) |
| Benzene | 1.58E-03 lb/MMBtu | (2) | | 0.003 | (a) | 0.001 | (b) |
| Carbon Tetrachloride | 1.77E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| Chlorobenzene | 1.29E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| Chloroform | 1.37E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| Ethylbenzene | 2.48E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| Ethylene Dibromide | 2.13E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| Formaldehyde | 2.05E-02 lb/MMBtu | (2) | | 0.038 | (a) | 0.019 | (b) |
| Methanol | 3.06E-03 lb/MMBtu | (2) | | 0.006 | (a) | 0.003 | (b) |
| Methylene Chloride | 4.12E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| Naphthalene | 9.71E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| PAH (POM) | 1.41E-04 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| Styrene | 1.19E-05 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| Toluene | 5.58E-04 lb/MMBtu | (2) | | 0.001 | (a) | 0.001 | (b) |
| Vinyl Chloride | 7.18E-06 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| Xylenes | 1.95E-04 lb/MMBtu | (2) | | 0.000 | (a) | 0.000 | (b) |
| **Total HAPs** | | | | **0.059** | | **0.030** | |
| **Greenhouse Gas Emissions** | | | | | | | |
| $CO_2$ | 116.89 lb/MMBtu | (5) | | 214.14 | (a) | 107.07 | (b) |
| $CH_4$ | 2.2E-03 lb/MMBtu | (5) | | 0.00 | (a) | 0.00 | (b) |
| $N_2O$ | 2.2E-04 lb/MMBtu | (5) | | 0.00 | (a) | 0.00 | (b) |
| $CO_2e^{(g)}$ | - | - | | 214.36 | | 107.18 | |

**Calculations:**

**Hourly Emissions - If emission factor note 2 or 5 is used, use calculation (a). If emission factor note 4 is used, use calculation (b).**

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

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

**Annual Emissions - If emission factor note 2 or 5 is used, use calculation (c). If emission factor note 4 is used, use calculation (d).**

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

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

**$SO_2$ Emissions - If emission factor note 3 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.**

(e) Maximum Hourly Emissions SO2 Caclulation (lb/hr) = (20 grain S/100ft3) * Fuel throughput (ft3/hr) * (1lb/7000 grains) * (lbmol S/32.06 lb S) * (lbmol SO2/ lbmol S) *(64.07 lb SO2/lbmol SO2)

(f) Annual Emissions SO2 Caclulation (ton/yr) = (0.25 grain S/100ft3) * Fuel throughput (ft3/hr) * (1lb/7000 grains) * (lbmol S/32.06 lb S) * (lbmol SO2/ lbmol S) *(64.07 lb SO2/lbmol SO2) * Annual hours of operation (hr/yr) * (1ton/2000lbs)

| EMISSION INPUTS TABLE | | |
|---|---|---|
| Engine Power Output (kW) = | 171 | |
| Engine Power Output (hp) = | 229 | |
| Number of Engines Operating at a Time = | 1 | |
| Average BSFC (BTU/HP-hr) = | 8,000 | (6) |
| Heat Content Natural Gas(Btu/scf) = | 1,000.0 | (7) |
| Fuel Throughput (ft3/hr) = | 1,832.0 | (8) |
| PTE Hours of Operation = | 1,000 | |

(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 | (9) |
| $CH_4$ | 25 | (9) |
| $N_2O$ | 298 | (9) |

**Notes:**

(1) 45 CSR 13, Permit R13-2479C, Condition 4.1.12 Outlines a Safety Factor / Multiplier used in Cacluation of certain criteria pollutants

(2) AP-42, Chapter 3.2, Table 3.2-3. - *Uncontrolled Emission Factors for 4-Stroke Rich Burn Engines* (7/00)

(3) Emission Factors supplied from 45 CSR 13, Permit R13-2479C, Condition 4.1.12

(4) Emission Factors supplied from engine vendor; Waukesha Performance Data EN 123825, (4/99)

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

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

(7) Value obtained from AP-42, Chapter 3.2, Table 3.2-3, footnote b

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

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

**Table 5. TEG Dehydrator Reboiler Emissions (BL1)**
**NATCO; Model # SB24-18**
**Columbia Gas Transmission - Hubball Compressor Station**

| Pollutant | Emission Factor | | PTE per Burner (lb/hr) | | PTE per Burner (ton/yr) | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **Criteria Pollutants** | | | | | | |
| PM/PM10/PM2.5 | 1.9 lb/MMcf | (1) | 0.0014 | (a) | 0.01 | (b) |
| $SO_2$ (Hourly) | 20 grains S / 100ft$^3$ | (5) | 0.042 | (e) | - | |
| $SO_2$ (Annual) | 2.0 grains S / 100ft$^3$ | (5) | - | | 0.02 | (f) |
| NOx | 100 lb/MMcf | (2) | 0.07 | (a) | 0.32 | (b) |
| CO | 84 lb/MMcf | (2) | 0.06 | (a) | 0.27 | (b) |
| VOC | 5.5 lb/MMcf | (1) | 0.0040 | (a) | 0.02 | (b) |
| | | | | | | |
| **Hazardous Air Pollutants** | | | | | | |
| Arsenic | 2.00E-04 lb/MMcf | (3) | 0.00 | (a) | 0.000 | (b) |
| Benzene | 2.10E-03 lb/MMcf | (4) | 0.00 | (a) | 0.000 | (b) |
| Beryllium | 1.20E-05 lb/MMcf | (3) | 0.00 | (a) | 0.000 | (b) |
| Cadmium | 1.10E-03 lb/MMcf | (3) | 0.00 | (a) | 0.000 | (b) |
| Chromium | 1.40E-03 lb/MMcf | (3) | 0.00 | (a) | 0.000 | (b) |
| Cobalt | 8.40E-05 lb/MMcf | (3) | 0.00 | (a) | 0.000 | (b) |
| Dichlorobenzene | 1.20E-03 lb/MMcf | (4) | 0.00 | (a) | 0.000 | (b) |
| Formaldehyde | 7.50E-02 lb/MMcf | (4) | 0.00 | (a) | 0.000 | (b) |
| Hexane | 1.80E+00 lb/MMcf | (4) | 0.00 | (a) | 0.006 | (b) |
| Lead | 5.00E-04 lb/MMcf | (3) | 0.00 | (a) | 0.000 | (b) |
| Manganese | 3.80E-04 lb/MMcf | (3) | 0.00 | (a) | 0.000 | (b) |
| Mercury | 2.60E-04 lb/MMcf | (3) | 0.00 | (a) | 0.000 | (b) |
| Naphthalene | 6.10E-04 lb/MMcf | (4) | 0.00 | (a) | 0.000 | (b) |
| Nickel | 2.10E-03 lb/MMcf | (3) | 0.00 | (a) | 0.000 | (b) |
| PAH/POM | 1.29E-03 lb/MMcf | (4) | 0.00 | (a) | 0.000 | (b) |
| Selenium | 2.40E-05 lb/MMcf | (3) | 0.00 | (a) | 0.000 | (b) |
| Toluene | 3.40E-03 lb/MMcf | (4) | 0.00 | (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)

**$SO_2$**

(e) Hourly Emissions SO2 Caclulation (lb/hr) = (20 grain S/100ft3) * Fuel throughput (MMft3/yr) * (1000000ft3/1MMft3) / annual hours of operation (hr/yr) * (1lb/7000 grains) * (lbmol S/32.06 lb S) * (lbmol SO2/ lbmol S) *(64.07 lb SO2/lbmol SO2)

(f) Annual Emissions SO2 Caclulation (ton/yr) = (0.25 grain S/100ft3) * Fuel throughput (MMft3/yr) * (1000000ft3/1MMft3) * (1lb/7000 grains) * (lbmol S/32.06 lb S) * (lbmol SO2/ lbmol S) *(64.07 lb SO2/lbmol SO2) * (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) = | 6.4 |

(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 6. Dehydration Unit Still Vent Emissions (TEGDEHY1)**
**BS&B**
**Columbia Gas Transmission - Hubball Compressor Station**

| Source | PTE per unit (lb/hr) | PTE per unit (lb/day) | PTE[(1)] per unit (tons/yr) |
|---|---|---|---|
| **Criteria Pollutants** | | | |
| VOC | 1.869 | 44.867 | 8.188 |
| | | | |
| **Hazardous Air Pollutants** | | | |
| Benzene | 0.050 | 1.203 | 0.220 |
| Toluene | 0.082 | 1.980 | 0.361 |
| Ethylbenzene | 0.017 | 0.416 | 0.076 |
| Xylenes | 0.146 | 3.515 | 0.641 |
| n-Hexane | 0.043 | 1.034 | 0.189 |
| | | | |
| **Total HAP** | 0.3395 | 8.1468 | **1.4868** |
| | | | |
| **Greenhouse Gas Emissions** | | | |
| $CO_2$ | | | - |
| $CH_4$ | 1.1361 | 27.2668 | 4.9762 |
| $N_2O$ | - | - | - |
| $CO_2e$[(a)] | 28.40 | 681.67 | 124.41 |

**Calculations:**

| EMISSION INPUTS | |
|---|---|
| Dehy Rating (MMscf/d) = | 35.1 |
| Number of Units = | 1 |
| Control Efficiency (%) = | 95.00% |
| 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) Emissions Calculated utilizing GRI-GLYCalc and reflect the controlled regenerator emissions

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

**Table 7. Flare (FL1) Emissions**
**NATCO SHV-2.5; 1.00 mmBTU/hr**
**Columbia Gas Transmission - Hubball Compressor Station**

**Criteria Pollutants:**

| Pollutant | Emission Factor (lb/MMBtu)[1] | Volume (scf/hr)[2] | Gas Heat Value (Btu/scf)[3] | Emissions (lbs/hr) | Emissions (ton/yr) |
|---|---|---|---|---|---|
| CO[1] | 0.37 | 980.4 | 1,020 | 0.37 | 1.62 |
| NOx[1] | 0.07 | 980.4 | 1,020 | 0.07 | 0.30 |
| VOC[1] | 0.57 | 980.4 | 1,020 | 0.57 | 2.50 |

**Calculations:**

Hourly Emissions (lb/hr) = Emission Factor (lb/MMBtu) * Volume (scf/hr) * gas heat value (Btu/scf) * (1MMBtu/1000000Btu)

Annual Emissions (ton/yr) = Emission Factor (lb/MMBtu) * Volume (scf/hr) * gas heat value (Btu/scf) * (1MMBtu/1000000Btu) * Hours of Operation (8760 hr/yr) * (ton/2000 lbs)

| Pollutant | Volume (scf/hr)[2] | grain S / 100 scf[4] | Grain to Lb conversion | Mol weight S (g/mol) | Mol weight $SO_2$ (g/mol) | Emissions (lbs/hr) | Emissions (ton/yr) |
|---|---|---|---|---|---|---|---|
| SO2 | 980.4 | 20.00 | 7000 / 1 | 32.06 | 64.07 | 0.06 | 0.25 |

**Calculations:**

Hourly Emissions SO2 (lb/hr) = (0.25 grain S/100scf) * Volume (scf/hr) * (1lb/7000 grains) * (lbmol S/32.06 lb S) * (lbmol SO2/ lbmol S) *(64.07 lb SO2/lbmol SO2)

Annual Emissions SO2 (ton/yr) = (0.25 grain S/100scf) * Volume (scf/hr) * (1lb/7000 grains) * (lbmol S/32.06 lb S) * (lbmol SO2/ lbmol S) *(64.07 lb SO2/lbmol SO2) * Hours of operation (8760 hr/yr) * (ton/2000lbs)

**Greenhouse Gases:**

| Pollutant | Emission Factor (lb/MMBtu)[5] | Volume (scf/hr)[2] | Gas Heat Value (Btu/scf)[3] | Emissions (lbs/hr) | Emissions (ton/yr) |
|---|---|---|---|---|---|
| $CO_2$ | 116.89 | 980.4 | 1,020 | 116.89 | 511.98 |
| $CH_4$ | 2.20E-03 | 980.4 | 1,020 | 0.00 | 0.01 |
| $N_2O$ | 2.20E-04 | 980.4 | 1,020 | 0.00 | 0.00 |
| $CO_2e$[a] | - | - | - | 117.01 | 512.51 |

(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 | (6) |
| $CH_4$ | 25 | (6) |
| $N_2O$ | 298 | (6) |

**Notes:**

(1) AP-42, Chapter 13.5, Table 13.5-1. *Emission Factors for Flare Operations* (1/95)

(2) Flare Volume based on manufacturer's specifications

(3) Value obtained from AP-42, Chapter 3.2, Table 3.2-3, footnote b

(4) AP-42, Chapter 5.3, Section 5.3.1 (1/95)

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

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

**Table 8. Tank Emissions**
**Columbia Gas Transmission - Hubball Compressor Station**

| Emission Point | 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)] |
|---|---|---|---|---|---|---|---|---|---|
| A05 | 4200 | Oil/Water Mixture | None | 3.29 | 1.67E-03 | (1) | 2.00 | 0.000 | 0.001 |
| A06 | 1000 | Used Oil | None | 0.78 | 1.96E-03 | (1) | 0.56 | 0.000 | 0.000 |
| A07 | 1000 | Glycol | None | 0.78 | 1.75E-04 | (1) | 0.05 | 0.000 | 0.000 |
| A08 | 1000 | Glycol | None | 0.78 | 1.75E-04 | (1) | 0.05 | 0.000 | 0.000 |
| A09 | 550 | Scrubber Oil | None | 0.43 | 2.04E-03 | (1) | 0.32 | 0.000 | 0.000 |
| A10 | 2000 | Pipeline Liquids | None | 1.57 | 1.26E+00 | (2) | 722.29 | 0.082 | 0.361 |
| A11 | 5000 | Pipeline Liquids | None | 3.91 | 1.39E+00 | (2) | 1980.00 | 0.226 | 0.990 |
| A13 | 12000 | Pipeline Liquids | None | 9.39 | 8.93E-01 | (2) | 3061.71 | 0.350 | 1.531 |
| A14 | 125 | Used Oil | None | 0.10 | 3.08E-03 | (1) | 0.11 | 0.000 | 0.000 |
| B01 | 5058 | Used Oil | None | 3.96 | 6.99E-04 | (1) | 1.01 | 0.000 | 0.001 |
| **Totals** | | | | | | | **5768.10** | **0.66** | **2.88** |

**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 Working/Breathing losses as calculated from TANKS 4.0.9.d

(2) VOC emission factor includes Flashing/Working/Breathing losses calculated from pressurized liquid sample (GOR= 0.059 lb VOC/bbl) direct flash measurement added to working and breathing losses calculated using EPA Tanks 4.09. The pressurized liquid sample was taken from a high pressure separator at a similar site and is considered to be worst case representative with respect to gas composition and pressure at the Station

**Table 9. Fugitive Leak Emissions**
**Columbia Gas Transmission - Hubball Compressor Station**

| Pollutant | Emission Factor | | | PTE[(a) Gas Service] (tons/yr) |
|---|---|---|---|---|
| Valves | 9.9E-03 | lb/hr/source | (1) | 3.08 |
| Low Bleed Pneumatic Valves | 9.9E-03 | lb/hr/source | (1) | 1.56 |
| Flanges | 8.6E-04 | lb/hr/source | (1) | 1.13 |
| Connector | 4.4E-04 | lb/hr/source | (1) | 0.58 |
| Other Points in Gas Service | 1.9E-02 | lb/hr/source | (1) | 1.50 |
| **Total Gas Released** | - | - | | 7.86 |
| Total VOC Released (gas service) | | | (b) | **0.86** |
| | | | **CO2e** | 20.11 |

**Calculations:**

(a) Annual emissions (tons/yr) = [Emission Factor (lb/hr/source)] x [Number of Sources] x [Hours of Operation per Year] x [0.0005 tons/ lb]

(b) Gas sample for station assumed to be worst case at 11 wt % VOC[(3)]

Number of Components in Gas Service

| | | |
|---|---|---|
| Valves= | 71 | (2) |
| Low Bleed Pneumatic Valves= | 36 | (2) |
| Connectors= | 301 | (2) |
| Other Points in Gas Service = | 8 | (2) |
| Maximum Hour of Operation = | 8,760 | |

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

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

(3) Worst case VOC wt % assumption for station based on gas sample analysis from April 2014

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

# APPENDIX B

# PROPOSED PERMIT LANGUAGE

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017

West Virginia Department of Environmental Protection
Division of Air Quality

*Jim Justice*
*Governor*

*Austin Caperton*
*Cabinet Secretary*

# Permit to Operate

Pursuant to
**Title V**
of the Clean Air Act

*Issued to:*

**Columbia Gas Transmission, LLC**
**Hubball Compressor Station**
**R30-04300002-2017**

William F. Durham
Director

*Issued:* • *Effective:* Draft
*Expiration:* • *Renewal Application Due:*

Permit Number: **R30-04300002-2017**
Permittee: **Columbia Gas Transmission, LLC**
Facility Name: **Hubball Compressor Station**
Permittee Mailing Address: **5151 San Felipe St., Suite 2400, Houston, TX, 77056**

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*This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45CSR30 — Requirements for Operating Permits. The permittee identified at the above-referenced facility is authorized to operate the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.*

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| | |
|---|---|
| Facility Location: | Hubball, Lincoln County, West Virginia |
| Facility Mailing Address: | Route 3, Box 465, Branchland, WV 25506 |
| Telephone Number: | (304) 778 7576 |
| Type of Business Entity: | LLC |
| Facility Description: | Natural Gas Compression Facility |
| SIC Codes: | 1311 |
| UTM Coordinates: | 396.016 km Easting • 4,228.873 km Northing • Zone 17 |

Permit Writer: Engineer's Name

*Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§ 22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §22-5-14.*

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*Issuance of this Title V Operating Permit does not supersede or invalidate any existing permits under 45CSR13, 14 or 19, although all applicable requirements from such permits governing the facility's operation and compliance have been incorporated into the Title V Operating Permit.*

**Table of Contents**

## 1.0 Emission Units and Active R13, R14, and R19 Permits

### 1.1. Emission Units

| Emission Unit ID | Emission Point ID | Emission Unit Description (Make, Model, Serial No.) | Year Installed | Design Capacity | Control Device |
|---|---|---|---|---|---|
| 01601 | E01 | Reciprocating Engine/Integral Compressor; Ingersoll Rand 48KVS; 4 Cycle, Lean Burn | 1966 | 1,320 HP | C1 |
| 01602 | E02 | Reciprocating Engine/Integral Compressor; Ingersoll Rand 48KVS; 4 Cycle, Lean Burn | 1966 | 1,320 HP | C2 |
| 01603 | E03 | Reciprocating Engine/Integral Compressor; Clark RA-6; 2 Cycle, Lean Burn | 1948 | 600 HP | N/A |
| 016G2 | G2 | Reciprocating Engine/Generator; Waukesha F11GSI; 4 Cycle, Rich Burn | 2000 | 229 hp | N/A |
| BLR1 | BL1 | Dehydrator Reboiler; NATCO; Model # SB24-18 | 1965 | 0.75 mmBtu/hr ~~1.25 mmBtu/hr~~ | N/A |
| TEGDEHY1 | FL1 | TEG Dehydrator; BS&B | 1998 ~~1965~~ | 35.1 MMscf/d | FLLP1 |
| FLLP1 | FL1 | Dehydrator Flare; NATCO, Model SHV-2.5 | 1998 | 1.00 MMBtu/hr | |

### 1.1. Active R13, R14, and R19 Permits

The underlying authority for any conditions from R13, R14, and/or R19 permits contained in this operating permit is cited using the original permit number (e.g. R13-1234). The current applicable version of such permit(s) is listed below.

| Permit Number | Date of Issuance |
|---|---|
| R13-2479C | 03-09-2015 |

# 2.0 General Conditions

## 2.1. Definitions

2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.

2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.

2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.1.4. Unless otherwise specified in a permit condition or underlying rule or regulation, all references to a "rolling yearly total" shall mean the sum of the monthly data, values or parameters being measured, monitored, or recorded, at any given time for the previous twelve (12) consecutive calendar months.

## 2.2. Acronyms

| | | | |
|---|---|---|---|
| **CAAA** | Clean Air Act Amendments | **PM** | Particulate Matter |
| **CBI** | Confidential Business Information | **$PM_{10}$** | Particulate Matter less than 10μm in diameter |
| **CEM** | Continuous Emission Monitor | | |
| **CES** | Certified Emission Statement | **pph** | Pounds per Hour |
| **C.F.R. *or* CFR** | Code of Federal Regulations | **ppm** | Parts per Million |
| **CO** | Carbon Monoxide | **PSD** | Prevention of Significant Deterioration |
| **C.S.R. *or* CSR** | Codes of State Rules | | |
| **DAQ** | Division of Air Quality | **psi** | Pounds per Square Inch |
| **DEP** | Department of Environmental Protection | **SIC** | Standard Industrial Classification |
| **FOIA** | Freedom of Information Act | **SIP** | State Implementation Plan |
| **HAP** | Hazardous Air Pollutant | **$SO_2$** | Sulfur Dioxide |
| **HON** | Hazardous Organic NESHAP | **TAP** | Toxic Air Pollutant |
| **HP** | Horsepower | **TPY** | Tons per Year |
| **lbs/hr *or* lb/hr** | Pounds per Hour | **TRS** | Total Reduced Sulfur |
| **LDAR** | Leak Detection and Repair | **TSP** | Total Suspended Particulate |
| **m** | Thousand | **USEPA** | United States Environmental Protection Agency |
| **MACT** | Maximum Achievable Control Technology | | |
| **mm** | Million | **UTM** | Universal Transverse Mercator |
| **mmBtu/hr** | Million British Thermal Units per Hour | **VEE** | Visual Emissions Evaluation |
| **$mmft^3$/hr *or* mmcf/hr** | Million Cubic Feet Burned per Hour | **VOC** | Volatile Organic Compounds |
| **NA *or* N/A** | Not Applicable | | |
| **NAAQS** | National Ambient Air Quality Standards | | |
| **NESHAPS** | National Emissions Standards for Hazardous Air Pollutants | | |
| **$NO_x$** | Nitrogen Oxides | | |
| **NSPS** | New Source Performance Standards | | |

## 2.3. Permit Expiration and Renewal

2.3.1. Permit duration. This permit is issued for a fixed term of five (5) years and shall expire on the date specified on the cover of this permit, except as provided in 45CSR§30-6.3.b. and 45CSR§30-6.3.c.
**[45CSR§30-5.1.b.]**

2.3.2. A permit renewal application is timely if it is submitted at least six (6) months prior to the date of permit expiration.
**[45CSR§30-4.1.a.3.]**

2.3.3. Permit expiration terminates the source's right to operate unless a timely and complete renewal application has been submitted consistent with 45CSR§30-6.2. and 45CSR§30-4.1.a.3.
**[45CSR§30-6.3.b.]**

2.3.4. If the Secretary fails to take final action to deny or approve a timely and complete permit application before the end of the term of the previous permit, the permit shall not expire until the renewal permit has been issued or denied, and any permit shield granted for the permit shall continue in effect during that time.
**[45CSR§30-6.3.c.]**

## 2.4. Permit Actions

2.4.1. This permit may be modified, revoked, reopened and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.
**[45CSR§30-5.1.f.3.]**

## 2.5. Reopening for Cause

2.5.1. This permit shall be reopened and revised under any of the following circumstances:

a. Additional applicable requirements under the Clean Air Act or the Secretary's legislative rules become applicable to a major source with a remaining permit term of three (3) or more years. Such a reopening shall be completed not later than eighteen (18) months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions has been extended pursuant to 45CSR§§30-6.6.a.1.A. or B.

b. Additional requirements (including excess emissions requirements) become applicable to an affected source under Title IV of the Clean Air Act (Acid Deposition Control) or other legislative rules of the Secretary. Upon approval by U.S. EPA, excess emissions offset plans shall be incorporated into the permit.

c. The Secretary or U.S. EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit.

d. The Secretary or U.S. EPA determines that the permit must be revised or revoked and reissued to assure compliance with the applicable requirements.

**[45CSR§30-6.6.a.]**

## 2.6. Administrative Permit Amendments

2.6.1. The permittee may request an administrative permit amendment as defined in and according to the procedures specified in 45CSR§30-6.4.
**[45CSR§30-6.4.]**

## 2.7. Minor Permit Modifications

2.7.1. The permittee may request a minor permit modification as defined in and according to the procedures specified in 45CSR§30-6.5.a.
**[45CSR§30-6.5.a.]**

## 2.8. Significant Permit Modification

2.8.1. The permittee may request a significant permit modification, in accordance with 45CSR§30-6.5.b., for permit modifications that do not qualify for minor permit modifications or as administrative amendments.
**[45CSR§30-6.5.b.]**

## 2.9. Emissions Trading

2.9.1. No permit revision shall be required, under any approved economic incentives, marketable permits, emissions trading, and other similar programs or processes for changes that are provided for in the permit and that are in accordance with all applicable requirements.
**[45CSR§30-5.1.h.]**

## 2.10. Off-Permit Changes

2.10.1. Except as provided below, a facility may make any change in its operations or emissions that is not addressed nor prohibited in its permit and which is not considered to be construction nor modification under any rule promulgated by the Secretary without obtaining an amendment or modification of its permit. Such changes shall be subject to the following requirements and restrictions:

a. The change must meet all applicable requirements and may not violate any existing permit term or condition.

b. The permittee must provide a written notice of the change to the Secretary and to U.S. EPA within two (2) business days following the date of the change. Such written notice shall describe each such change, including the date, any change in emissions, pollutants emitted and any applicable requirement that would apply as a result of the change.

c. The change shall not qualify for the permit shield.

d. The permittee shall keep records describing all changes made at the source that result in emissions of regulated air pollutants, but not otherwise regulated under the permit, and the emissions resulting from those changes.

e. No permittee may make any change subject to any requirement under Title IV of the Clean Air Act (Acid Deposition Control) pursuant to the provisions of 45CSR§30-5.9.

f. No permittee may make any changes which would require preconstruction review under any provision of Title I of the Clean Air Act (including 45CSR14 and 45CSR19) pursuant to the provisions of 45CSR§30-5.9.

**[45CSR§30-5.9.]**

## 2.11. Operational Flexibility

2.11.1. The permittee may make changes within the facility as provided by § 502(b)(10) of the Clean Air Act. Such operational flexibility shall be provided in the permit in conformance with the permit application and applicable requirements. No such changes shall be a modification under any rule or any provision of Title I of the Clean Air Act (including 45CSR14 and 45CSR19) promulgated by the Secretary in accordance with Title I of the Clean Air Act and the change shall not result in a level of emissions exceeding the emissions allowable under the permit.
**[45CSR§30-5.8]**

2.11.2. Before making a change under 45CSR§30-5.8., the permittee shall provide advance written notice to the Secretary and to U.S. EPA, describing the change to be made, the date on which the change will occur, any changes in emissions, and any permit terms and conditions that are affected. The permittee shall thereafter maintain a copy of the notice with the permit, and the Secretary shall place a copy with the permit in the public file. The written notice shall be provided to the Secretary and U.S. EPA at least seven (7) days prior to the date that the change is to be made, except that this period may be shortened or eliminated as necessary for a change that must be implemented more quickly to address unanticipated conditions posing a significant health, safety, or environmental hazard. If less than seven (7) days' notice is provided because of a need to respond more quickly to such unanticipated conditions, the permittee shall provide notice to the Secretary and U.S. EPA as soon as possible after learning of the need to make the change.
**[45CSR§30-5.8.a.]**

2.11.3. The permit shield shall not apply to changes made under 45CSR§30-5.8., except those provided for in 45CSR§30-5.8.d. However, the protection of the permit shield will continue to apply to operations and emissions that are not affected by the change, provided that the permittee complies with the terms and conditions of the permit applicable to such operations and emissions. The permit shield may be reinstated for emissions and operations affected by the change:

a. If subsequent changes cause the facility's operations and emissions to revert to those authorized in the permit and the permittee resumes compliance with the terms and conditions of the permit, or

b. If the permittee obtains final approval of a significant modification to the permit to incorporate the change in the permit.

**[45CSR§30-5.8.c.]**

2.11.4. "Section 502(b)(10) changes" are changes that contravene an express permit term. Such changes do not include changes that would violate applicable requirements or contravene enforceable permit terms and conditions that are monitoring (including test methods), recordkeeping, reporting, or compliance certification requirements.
**[45CSR§30-2.39]**

## 2.12. Reasonably Anticipated Operating Scenarios

2.12.1. The following are terms and conditions for reasonably anticipated operating scenarios identified in this permit.

a. Contemporaneously with making a change from one operating scenario to another, the permittee shall record in a log at the permitted facility a record of the scenario under which it is operating and to document the change in reports submitted pursuant to the terms of this permit and 45CSR30.

b. The permit shield shall extend to all terms and conditions under each such operating scenario; and

c. The terms and conditions of each such alternative scenario shall meet all applicable requirements and the requirements of 45CSR30.

**[45CSR§30-5.1.i.]**

## 2.13. Duty to Comply

2.13.1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.
**[45CSR§30-5.1.f.1.]**

## 2.14. Inspection and Entry

2.14.1. The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;

d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

**[45CSR§30-5.3.b.]**

## 2.15. Schedule of Compliance

2.15.1. For sources subject to a compliance schedule, certified progress reports shall be submitted consistent with the applicable schedule of compliance set forth in this permit and 45CSR§30-4.3.h., but at least every six (6) months, and no greater than once a month, and shall include the following:

a. Dates for achieving the activities, milestones, or compliance required in the schedule of compliance, and dates when such activities, milestones or compliance were achieved; and

b. An explanation of why any dates in the schedule of compliance were not or will not be met, and any preventative or corrective measure adopted.

**[45CSR§30-5.3.d.]**

## 2.16. Need to Halt or Reduce Activity not a Defense

2.16.1. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.
**[45CSR§30-5.1.f.2.]**

## 2.17. Emergency

2.17.1. An "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.
**[45CSR§30-5.7.a.]**

2.17.2. Effect of any emergency. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of 45CSR§30-5.7.c. are met.
**[45CSR§30-5.7.b.]**

2.17.3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An emergency occurred and that the permittee can identify the cause(s) of the emergency;

b. The permitted facility was at the time being properly operated;

c. During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and

d. Subject to the requirements of 45CSR§30-5.1.c.3.C.1, the permittee submitted notice of the emergency to the Secretary within one (1) working day of the time when emission limitations were exceeded due to the emergency and made a request for variance, and as applicable rules provide. This notice, report, and variance request fulfills the requirement of 45CSR§30-5.1.c.3.B. This notice must contain a detailed description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.

**[45CSR§30-5.7.c.]**

2.17.4. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.
**[45CSR§30-5.7.d.]**

2.17.5. This provision is in addition to any emergency or upset provision contained in any applicable requirement.
**[45CSR§30-5.7.e.]**

## 2.18. Federally-Enforceable Requirements

2.18.1. All terms and conditions in this permit, including any provisions designed to limit a source's potential to emit and excepting those provisions that are specifically designated in the permit as "State-enforceable only", are enforceable by the Secretary, USEPA, and citizens under the Clean Air Act.
**[45CSR§30-5.2.a.]**

2.18.2. Those provisions specifically designated in the permit as “State-enforceable only” shall become “Federally-enforceable” requirements upon SIP approval by the USEPA.

## 2.19. Duty to Provide Information

2.19.1. The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records required to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.
**[45CSR§30-5.1.f.5.]**

## 2.20. Duty to Supplement and Correct Information

2.20.1. Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.
**[45CSR§30-4.2.]**

## 2.21. Permit Shield

2.21.1. Compliance with the conditions of this permit shall be deemed compliance with any applicable requirements as of the date of permit issuance provided that such applicable requirements are included and are specifically identified in this permit or the Secretary has determined that other requirements specifically identified are not applicable to the source and this permit includes such a determination or a concise summary thereof.
**[45CSR§30-5.6.a.]**

2.21.2. Nothing in this permit shall alter or affect the following:

a. The liability of an owner or operator of a source for any violation of applicable requirements prior to or at the time of permit issuance; or

b. The applicable requirements of the Code of West Virginia and Title IV of the Clean Air Act (Acid Deposition Control), consistent with § 408 (a) of the Clean Air Act.

c. The authority of the Administrator of U.S. EPA to require information under § 114 of the Clean Air Act or to issue emergency orders under § 303 of the Clean Air Act.

**[45CSR§30-5.6.c.]**

## 2.22. Credible Evidence

2.22.1. Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defenses otherwise available to the permittee including but not limited to any challenge to the credible evidence rule in the context of any future proceeding.
**[45CSR§30-5.3.e.3.B. and 45CSR38]**

## 2.23. Severability

2.23.1. The provisions of this permit are severable. If any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid by a court of competent jurisdiction, the remaining permit terms and conditions or their application to other circumstances shall remain in full force and effect.
**[45CSR§30-5.1.e.]**

## 2.24. Property Rights

2.24.1. This permit does not convey any property rights of any sort or any exclusive privilege.
**[45CSR§30-5.1.f.4]**

## 2.25. Acid Deposition Control

2.25.1. Emissions shall not exceed any allowances that the source lawfully holds under Title IV of the Clean Air Act (Acid Deposition Control) or rules of the Secretary promulgated thereunder.

a. No permit revision shall be required for increases in emissions that are authorized by allowances acquired pursuant to the acid deposition control program, provided that such increases do not require a permit revision under any other applicable requirement.

b. No limit shall be placed on the number of allowances held by the source. The source may not, however, use allowances as a defense to noncompliance with any other applicable requirement.

c. Any such allowance shall be accounted for according to the procedures established in rules promulgated under Title IV of the Clean Air Act.

**[45CSR§30-5.1.d.]**

2.25.2. Where applicable requirements of the Clean Air Act are more stringent than any applicable requirement of regulations promulgated under Title IV of the Clean Air Act (Acid Deposition Control), both provisions shall be incorporated into the permit and shall be enforceable by the Secretary and U. S. EPA.
**[45CSR§30-5.1.a.2.]**

## 3.0 Facility-Wide Requirements

### 3.1. Limitations and Standards

3.1.1. **Open burning.** The open burning of refuse by any person is prohibited except as noted in 45CSR§6-3.1. **[45CSR§6-3.1.]**

3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause or allow any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible. **[45CSR§6-3.2.]**

3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management and the Bureau for Public Health - Environmental Health requires a copy of this notice to be sent to them. **[40 C.F.R. §61.145(b) and 45CSR34]**

3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. **[45CSR§4-3.1 State-Enforceable only.]**

3.1.5. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11. **[45CSR§11-5.2]**

3.1.6. **Emission inventory.** The permittee is responsible for submitting, on an annual basis, an emission inventory in accordance with the submittal requirements of the Division of Air Quality. **[W.Va. Code § 22-5-4(a)(14)]**

3.1.7. **Ozone-depleting substances.** For those facilities performing maintenance, service, repair or disposal of appliances, the permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 C.F.R. Part 82, Subpart F, except as provided for Motor Vehicle Air Conditioners (MVACs) in Subpart B:

a. Persons opening appliances for maintenance, service, repair, or disposal must comply with the prohibitions and required practices pursuant to 40 C.F.R. §§ 82.154 and 82.156.

b. Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to 40 C.F.R. § 82.158.

c. Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to 40 C.F.R. § 82.161.

**[40 C.F.R. 82, Subpart F]**

3.1.8. **Risk Management Plan.** Should this stationary source, as defined in 40 C.F.R. § 68.3, become subject to Part 68, then the owner or operator shall submit a risk management plan (RMP) by the date specified in 40 C.F.R. § 68.10 and shall certify compliance with the requirements of Part 68 as part of the annual compliance certification as required by 40 C.F.R. Part 70 or 71.
**[40 C.F.R. 68]**

3.1.9. No person shall cause, suffer, allow or permit fugitive particulate matter to be discharged beyond the boundary lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution.
**[45CSR§17-3.1; State Enforceable Only]**

## 3.2. Monitoring Requirements

3.2.1. Reserved

## 3.3. Testing Requirements

3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63, if applicable, in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable.

b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit.

c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.

d. The permittee shall submit a report of the results of the stack test within 60 days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:

1. The permit or rule evaluated, with the citation number and language.

2. The result of the test for each permit or rule condition.

3. A statement of compliance or non-compliance with each permit or rule condition.

**[WV Code §§ 22-5-4(a)(14-15) and 45CSR13]**

## 3.4. Recordkeeping Requirements

3.4.1. **Monitoring information.** The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit and time of sampling or measurements;

b. The date(s) analyses were performed;

c. The company or entity that performed the analyses;

d. The analytical techniques or methods used;

e. The results of the analyses; and

f. The operating conditions existing at the time of sampling or measurement.

**[45CSR§30-5.1.c.2.A.]**

3.4.2. **Retention of records.** The permittee shall retain records of all required monitoring data and support information for a period of at least five (5) years from the date of monitoring sample, measurement, report, application, or record creation date. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Where appropriate, records may be maintained in computerized form in lieu of the above records.
**[45CSR§30-5.1.c.2.B.]**

3.4.3. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
**[45CSR§30-5.1.c. State-Enforceable only.]**

## 3.5. Reporting Requirements

3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.
**[45CSR§§30-4.4. *and* 5.1.c.3.D.]**

3.5.2. A permittee may request confidential treatment for the submission of reporting required under 45CSR§30-5.1.c.3. pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.
**[45CSR§30-5.1.c.3.E.]**

3.5.3. Except for the electronic submittal of the annual certification to the USEPA as required in 3.5.5 below, all notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, mailed first class or by private carrier with postage prepaid to the address(es) set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

**If to the DAQ:**

Director
WVDEP
Division of Air Quality
601 57th Street SE
Charleston, WV 25304

Phone: 304/926-0475
FAX: 304/926-0478

**If to the US EPA:**

Associate Director
Office of Air Enforcement and Compliance Assistance (3AP20)
U. S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

3.5.4. **Certified emissions statement.** The permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality.
**[45CSR§30-8.]**

3.5.5. **Compliance certification.** The permittee shall certify compliance with the conditions of this permit on the forms provided by the DAQ. In addition to the annual compliance certification, the permittee may be required to submit certifications more frequently under an applicable requirement of this permit. The annual certification shall be submitted to the DAQ and USEPA on or before March 15 of each year, and shall certify compliance for the period ending December 31. The annual certification to the USEPA shall be submitted in electronic format only. It shall be submitted by e-mail to the following address: R3_APD_Permits@epa.gov. The permittee shall maintain a copy of the certification on site for five (5) years from submittal of the certification.
**[45CSR§30-5.3.e.]**

3.5.6. **Semi-annual monitoring reports.** The permittee shall submit reports of any required monitoring on or before September 15 for the reporting period January 1 to June 30 and on or before March 15 for the reporting period July 1 to December 31. All instances of deviation from permit requirements must be clearly identified in such reports. All required reports must be certified by a responsible official consistent with 45CSR§30-4.4.

**[45CSR§30-5.1.c.3.A.]**

3.5.7. **Emergencies.** For reporting emergency situations, refer to Section 2.17 of this permit.

3.5.8. **Deviations.**

a. In addition to monitoring reports required by this permit, the permittee shall promptly submit supplemental reports and notices in accordance with the following:

1. Any deviation resulting from an emergency or upset condition, as defined in 45CSR§30-5.7., shall be reported by telephone or telefax within one (1) working day of the date on which the permittee becomes aware of the deviation, if the permittee desires to assert the affirmative defense in accordance with 45CSR§30-5.7. A written report of such deviation, which shall include the probable cause of such deviations, and any corrective actions or preventative measures taken, shall be submitted and certified by a responsible official within ten (10) days of the deviation.

2. Any deviation that poses an imminent and substantial danger to public health, safety, or the environment shall be reported to the Secretary immediately by telephone or telefax. A written report of such deviation, which shall include the probable cause of such deviation, and any corrective actions or preventative measures taken, shall be submitted by the responsible official within ten (10) days of the deviation.

3. Deviations for which more frequent reporting is required under this permit shall be reported on the more frequent basis.

4. All reports of deviations shall identify the probable cause of the deviation and any corrective actions or preventative measures taken.

**[45CSR§30-5.1.c.3.C.]**

b. The permittee shall, in the reporting of deviations from permit requirements, including those attributable to upset conditions as defined in this permit, report the probable cause of such deviations and any corrective actions or preventive measures taken in accordance with any rules of the Secretary.
**[45CSR§30-5.1.c.3.B.]**

3.5.9. **New applicable requirements.** If any applicable requirement is promulgated during the term of this permit, the permittee will meet such requirements on a timely basis, or in accordance with a more detailed schedule if required by the applicable requirement.
**[45CSR§30-4.3.h.1.B.]**

## 3.6. Compliance Plan

3.6.1. None

## 3.7. Permit Shield

3.7.1. The permittee is hereby granted a permit shield in accordance with 45CSR§30-5.6. The permit shield applies provided the permittee operates in accordance with the information contained within this permit.

3.7.2. The following requirements specifically identified are not applicable to the source based on the determinations set forth below. The permit shield shall apply to the following requirements provided the conditions of the determinations are met.

| | |
|---|---|
| **45CSR4** | *To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Cause or Contributes to an Objectionable Odor or Odors:* This State Rule shall not apply to the following source of objectionable odor until such time as feasible control methods are developed: Internal combustion engines. |
| **45CSR10** | *To Prevent and Control Air Pollution from the Emission of Sulfur Dioxide* - Emissions from Indirect Heat Exchangers. WVDAQ has determined that 45CSR10 does not apply to natural gas fired engines. Also, 45CSR10 is not applicable to the facility's dehydrator reboiler because it is a fuel burning unit less than 10 MMBtu/hr in accordance with the exemptions defined within 45CSR§10-10.1. Additionally, the dehydration still vent is considered exempt from the manufacturing source requirements due to having a potential of less than 500 lb SO2/yr in accordance with 45CSR§10-4.1.e. |
| **45CSR21** | *To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds:* All storage tanks at the station, which are listed as insignificant sources, are below 40,000 gallons in capacity which exempts the facility from 45CSR§21-28. The compressor station is not engaged in the extraction or fractionation of natural gas which exempts the facility from 45CSR§21-29. Additionally this site is not located within one of the five designated VOC maintenance counties (Cabell, Kanawha, Putnam, Wayne & Wood) |
| **45CSR27** | *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." |
| **40 C.F.R. Part 60 Subpart Dc** | *Standards of Performance for Steam Generating Units:* The dehydration reboiler heater burner has a maximum design heat input capacity of less than 10 MMBtu/hr, which is below the applicability threshold defined within [40CFR60.40c(a)]. |
| **40 C.F.R. Part 60 Subpart K and Ka** | *Standards of Performance for Storage Vessels for Petroleum Liquids:* All tanks at the facility are below 40,000 gallons in capacity as specified in 60.110a(a) |
| **40 C.F.R. Part 60 Subpart Kb** | *Standards of Performance for Volatile Organic Liquid* Storage *Vessels:* All tanks at the facility are below 75$m^3$ (19,813 gallons) in capacity as specified in 60.110b(a) |
| **40 C.F.R. Part 60 Subpart KKK** | *Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plant(s).* The station is not engaged in the extraction or fractionation of natural gas liquids from field gas, the fractionation of mixed natural gas liquids from field gas, the fractionation of mixed natural gas liquids to natural gas products, or both. As a result, the station has no affected sources operating within this source category. |
| **40 C.F.R. Part 60 Subpart IIII** | *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.* The Compressor Station does not have any compression ignition internal combustion engines. |
| **40 C.F.R. Part 60 Subpart JJJJ** | *Standards of Performance for Stationary Spark Ignition (SI) Internal Combustion Engines.* All engines at the facility were constructed, |

| | |
|---|---|
| | reconstructed, or modified prior to the June 12, 2006 applicability date listed in 60.4230(a)(4). |
| **40 C.F.R. Part 60 Subpart OOOO** | *Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution.* The Storage Vessel requirements defined for transmission sources is not applicable to this site because all vessels were constructed, commenced construction, prior to August 23, 2011 as stated in accordance with [40CFR§60.5365(e)]. No other affected sources were identified at this site. |
| **40 C.F.R. Part 60 Subpart OOOOa** | *Standards of Performance for Crude Oil and Natural 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 constructed prior to September 18, 2015 in accordance with the applicability criteria defined within [40CFR§60.5365a] |
| **40 C.F.R. Part 63 Subpart HHH** | *National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities.* The Compressor Station is not subject to Subpart HHH since the station's function is to compress production gas and it is not a natural gas transmission and storage facility as defined under 40 C.F.R. § 63.1270. Additionally, the station is not a major source of HAPs. |
| **40 C.F.R. Part 63 Subpart DDDDD** | *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters*: This rule does not apply to this Station since it does not exceed major source HAP thresholds. |
| **40 C.F.R. Part 63 Subpart JJJJJJ** | *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources.* The facility is not subject to 40 C.F.R. Part 63 Subpart JJJJJJ since the dehydration reboiler is not a steam generating unit, but a process heater, which is not regulated under this source category. |
| **40 C.F.R. Part 64** | *Compliance Assurance Monitoring (CAM):* There are no add-on controls at this facility, which the exception of the TEG dehy, which is subject to 40 CFR 63, Subpart HH; therefore, in accordance with 40CFR§64.2(b)(1), CAM is not applicable to this facility. |

## 3.8. Emergency Operating Scenario

For emergency situations which interrupt the critical supply of natural gas to the public, and which pose a life threatening circumstance to the customer, the permittee is allowed to temporarily replace failed engine(s) as long as all of the following conditions are met:

a. The replacement engine(s) is only allowed to operate until repair of the failed engine(s) is complete, but under no circumstance may the replacement engine(s) operate in excess of sixty (60) days;

b. Both the replacement engine(s) and the repaired failed engine(s) shall not operate at the same time with the exception of any necessary testing of the repaired engine(s) and this testing may not exceed five (5) hours;

c. Potential hourly emissions from the replacement engine(s) are less than or equal to the potential hourly emissions from the engine(s) being replaced;

d. Credible performance emission test data verifying the emission rates associated with the operation of the substitute engine shall be submitted to the Director within five (5) days;

e. The permittee must provide written notification to the Director within five (5) days of the replacement. This notification must contain:

i. Information to support the claim of life threatening circumstances to justify applicability of this emergency provision;

ii. Identification of the engine(s) being temporarily replaced;

iii. The design parameters of the replacement engine(s) including, but not limited to, the design horsepower and emission factors;

iv. Projected duration of the replacement engine(s); and

v. The appropriate certification by a responsible official.

**[45CSR§30-12.7]**

## 4.0 Miscellaneous Indirect Natural Gas Heaters and Boilers less than 10 MMBtu/hr [Emission Unit ID: (BLR1)]

### 4.1. Limitations and Standards

4.1.1. 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.
**[45CSR§2-3.1.]**

4.1.2. Compliance with the visible emission requirements of 45CSR§2-3.1 (Section 4.1.1 of this permit) shall be determined in accordance with 40 C.F.R. Part 60, Appendix A, Method 9 or by using measurements from continuous opacity monitoring systems approved by the Director. The Director may require the installation, calibration, maintenance and operation of continuous opacity monitoring systems and may establish policies for the evaluation of continuous opacity monitoring results and the determination of compliance with the visible emission requirements of 45CSR§2-3.1 (Section 4.1.1 of this permit). Continuous opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control.
**[45CSR§2-3.2.]**

### 4.2. Monitoring Requirements

4.2.1. At such reasonable times as the Secretary may designate, the permittee shall conduct visible emissions observations using Method 22 for the purpose of demonstrating compliance with Section 4.1.1. If visible emissions are observed, the permittee shall conduct a Method 9 reading unless the cause for visible emissions is corrected within 24 hours. Records of observation will be kept for at least 5 years from the date of observation.
**[45CSR§30-12.7]**

### 4.3. Testing Requirements

4.3.1. N/A

### 4.4. Recordkeeping Requirements

4.4.1. N/A

### 4.5. Reporting Requirements

4.5.1. N/A

## 5.0 40 C.F.R. 63, Subpart ZZZZ GACT Requirements for Emergency Reciprocating Internal Combustion Engine(s) RICE at an Area HAP Source [Emission Unit ID (016G2)]

### 5.1 Limitations and Standards

5.1.1. As stated in 40 C.F.R. §§63.6603, the permittee must comply with the following requirements from Table 2d for existing stationary RICE located at area sources of HAP emissions:

| For each . . . | The permittee must meet the following requirements, except during periods of startup . . . |
|---|---|
| Emergency stationary SI RICE and black start stationary SI RICE | Change oil and filter every 500 hours of operation or annually, whichever comes first;[2] |
| | Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first; and |
| | Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.[3] |

[2] Sources have the option to utilize an oil analysis program as described in 40 C.F.R. §63.6625(i) or (j) in order to extend the specified oil change requirement in Table 2d of this subpart.
[3] Sources can petition the Administrator pursuant to the requirements of 40 CFR 63.6(g) for alternative work practices.

**[40 C.F.R. 63.6603 and Table 2d, Item 5]**

5.1.2. The permittee must comply with the applicable operating limitations in this section no later than October 19, 2013.
**[40 C.F.R. §63.6595(a)]**

5.1.3. The permittee shall comply with the following general requirements:

a. The permittee must be in compliance with the operating limitations in this subpart that apply to the permittee at all times.

b. At all times the permittee must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require the permittee to make any further efforts to reduce emissions if required levels have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

**[40 C.F.R. § 63.6605]**

5.1.4. The permittee shall demonstrate continuous compliance by doing the following:

a. The permittee must demonstrate continuous compliance with each emission limitation and operating limitation in Table 2d to 40 C.F.R. 63, Subpart ZZZZ that apply to the permittee according to methods specified in Table 6 to 40 C.F.R. 63, Subpart ZZZZ.

Table 6 states that for work or management practices the permittee shall operate and maintain the stationary RICE according to the manufacturer's emission related operation and maintenance instructions; or develop and follow your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.

b. The permittee must report each instance in which you did not meet each emission limitation or operating limitation in Table 2d to 40 C.F.R. 63, Subpart ZZZZ that apply. These instances are deviations from the emission and operating limitations. These deviations must be reported according to the requirements in 40 C.F.R. §63.6650.

c. The permittee must also report each instance in which the applicable requirements in Table 8 to 40 C.F.R. 63, Subpart ZZZZ were not met.

**[40 C.F.R. § 63.6640(a), (b), and (e)]**

5.1.5. If you own or operate an emergency stationary RICE, you must operate the emergency stationary RICE according to the requirements in paragraphs (f)(1) through (4) of this section. In order for the engine to be considered an emergency stationary RICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1) through (4) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1) through (4) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary RICE in emergency situations.

(2) You may operate your emergency stationary RICE for any combination of the purposes specified in paragraphs (f)(2)(i) through (iii) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraphs (f)(3) and (4) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).

(i) Emergency stationary RICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency RICE beyond 100 hours per calendar year.

(ii) Emergency stationary RICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §63.14), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

(iii) Emergency stationary RICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(3) Emergency stationary RICE located at major sources of HAP may be operated for up to 50 hours per

calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section. The 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

(4) Emergency stationary RICE located at area sources of HAP may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section. Except as provided in paragraphs (f)(4)(i) and (ii) of this section, the 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

(i) Prior to May 3, 2014, the 50 hours per year for non-emergency situations can be used for peak shaving or non-emergency demand response to generate income for a facility, or to otherwise supply power as part of a financial arrangement with another entity if the engine is operated as part of a peak shaving (load management program) with the local distribution system operator and the power is provided only to the facility itself or to support the local distribution system.

(ii) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:

(A) The engine is dispatched by the local balancing authority or local transmission and distribution system operator.

(B) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

(C) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

(D) The power is provided only to the facility itself or to support the local transmission and distribution system.

(E) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

**[40 C.F.R. § 63.6640(f)]**

5.1.5. The permittee shall comply with all applicable General Provisions according to Table 8 to 40 C.F.R., Part 63, Subpart ZZZZ.
**[40 C.F.R. § 63.6665]**

## 5.2. Monitoring Requirements

5.2.1. This facility is subject to the following requirements:

a. The permittee must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.
**[40 C.F.R. §63.6625(e)(3)]**

b. If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing emergency stationary RICE located at an area source of HAP emissions, you must install a non-resettable hour meter if one is not already installed.
**[40 C.F.R. §63.6625(f)]**

c. If you operate a new, reconstructed, or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Tables 1a, 2a, 2c, and 2d to this subpart apply.
**[40 C.F.R. §63.6625(h)]**

d. If you own or operate a stationary SI engine that is subject to the work, operation or management practices in items 6, 7, or 8 of Table 2c to this subpart or in items 5, 6, 7, 9, or 11 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Acid Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Acid Number increases by more than 3.0 milligrams of potassium hydroxide (KOH) per gram from Total Acid Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.
**[40 C.F.R. §63.6625(j)]**

**[40 C.F.R. § 63.6625]**

## 5.3. Testing Requirements

5.3.1. Reserved

## 5.4. Recordkeeping Requirements

5.4.1. If the permittee must comply with the emission and operating limitations, the permittee must keep the following records:

a. A copy of each notification and report submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status submitted, according to the requirement in 40 CFR §**63**.10(b)(2)(xiv).

b. Records of the occurrence and duration of each malfunction of operation ( *i.e.*, process equipment) or the air pollution control and monitoring equipment.

c. Records of performance tests and performance evaluations as required in 40 CFR §**63**.10(b)(2)(viii).

d. Records of all required maintenance performed on the air pollution control and monitoring equipment.

e. Records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR §**63**.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

**[40 CFR §63.6655(a)]**

5.4.2. The permittee shall keep the records required in Table 6 (Item 9) of this subpart to show continuous compliance with each emission or operating limitation that applied.
**[40 CFR §63.6655(d)]**

5.4.3. The permittee must keep records of the maintenance conducted on each stationary RICE in order to demonstrate that the permittee operated and maintained each stationary RICE and after-treatment control device (if any) according to the permittee's own maintenance plan.
**[40 CFR §63.6655(e)(2)]**

5.4.4. If you own or operate any of the stationary RICE in paragraphs (f)(1) through (2) of this section, you must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engine is used for the purposes specified in §63.6640(f)(2)(ii) or (iii) or §63.6640(f)(4)(ii), the owner or operator must keep records of the notification of the emergency situation, and the date, start time, and end time of engine operation for these purposes.

(2) An existing emergency stationary RICE located at an area source of HAP emissions that does not meet the standards applicable to non-emergency engines.

**[40 CFR §63.6655(f)(2)]**

## 5.5. Reporting Requirements

5.5.1. Each affected source that has obtained a Title V Operating Permit pursuant to 40 CFR part 70 or 71 must report all deviations as defined in this subpart in the semiannual monitoring report required by 40 CFR 70.6 (a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A). If an affected source submits a Compliance report pursuant to Table 7 of this subpart along with, or as part of, the semiannual monitoring report required by 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A), and the Compliance report includes all required information concerning deviations from any emission or operating limitation in this subpart, submission of the Compliance report shall be deemed to satisfy any obligation to report the same deviations in the semiannual monitoring report. However, submission of a Compliance report shall not otherwise affect any obligation the affected source may have to report deviations from permit requirements to the permit authority.
**[40 CFR §63.6650(f)]**

For each deviation from an emission or operating limitation that occurs for a stationary RICE where you are not using a CMS to comply with the emission or operating limitations in this subpart, the Compliance report must contain the information in paragraphs (c)(1) through (4) of this section and the information in paragraphs (d)(1) and (2) of this section.

(1) The total operating time of the stationary RICE at which the deviation occurred during the reporting period.

(2) Information on the number, duration, and cause of deviations (including unknown cause, if applicable), as applicable, and the corrective action taken.

**[40 CFR §63.6650(d)]**

## 5.6. Compliance Plan

5.6.1 N/A

## 6.0 40 C.F.R. 63, Subpart ZZZZ GACT Requirements for 2SLB Reciprocating Internal Combustion Engine(s) RICE, [Emission Unit ID: (01603)]

### 6.1 Limitations and Standards

6.1.1. As stated in 40 C.F.R. §§63.6603, the permittee must comply with the following requirements from Table 2d for existing stationary RICE located at area sources of HAP emissions:

| For each . . . | The permittee must meet the following requirements, except during periods of startup . . . |
|---|---|
| Emergency stationary SI RICE and black start stationary SI RICE | Change oil and filter every 4,320 hours of operation or annually, whichever comes first;[2] |
| | Inspect spark plugs every 4,320 hours of operation or annually, whichever comes first; and |
| | Inspect all hoses and belts every 4,320 hours of operation or annually, whichever comes first, and replace as necessary.[3] |

[2] Sources have the option to utilize an oil analysis program as described in 40 C.F.R. §63.6625(i) or (j) in order to extend the specified oil change requirement in Table 2d of this subpart.
[3] Sources can petition the Administrator pursuant to the requirements of 40 CFR 63.6(g) for alternative work practices.
**[40 C.F.R. 63.6603 and Table 2d, Item 6]**

6.1.2. The permittee must comply with the applicable operating limitations in this section no later than October 19, 2013.
**[40 C.F.R. §63.6595(a)]**

6.1.3. The permittee shall comply with the following general requirements:

a. The permittee must be in compliance with the operating limitations in this subpart that apply to the permittee at all times.

b. At all times the permittee must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require the permittee to make any further efforts to reduce emissions if required levels have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

**[40 C.F.R. § 63.6605]**

6.1.4. The permittee shall demonstrate continuous compliance by doing the following:

a. The permittee must demonstrate continuous compliance with each emission limitation and operating limitation in Table 2d to 40 C.F.R. 63, Subpart ZZZZ that apply to the permittee according to methods specified in Table 6 to 40 C.F.R. 63, Subpart ZZZZ.

Table 6 states that for work or management practices the permittee shall operate and maintain the stationary RICE according to the manufacturer's emission related operation and maintenance instructions; or develop and follow your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air

pollution control practice for minimizing emissions.

**[40 C.F.R. § 63.6640(a)]**

6.1.5. The permittee shall comply with all applicable General Provisions according to Table 8 to 40 C.F.R., Part 63, Subpart ZZZZ.
**[40 C.F.R. § 63.6665]**

## 6.2. Monitoring Requirements

6.2.1. This facility is subject to the following requirements:

a. The permittee must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.
**[40 C.F.R. §63.6625(e)(5)]**

b. If you operate a new, reconstructed, or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Tables 1a, 2a, 2c, and 2d to this subpart apply.
**[40 C.F.R. §63.6625(h)]**

d. If you own or operate a stationary SI engine that is subject to the work, operation or management practices in items 6, 7, or 8 of Table 2c to this subpart or in items 5, 6, 7, 9, or 11 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Acid Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Acid Number increases by more than 3.0 milligrams of potassium hydroxide (KOH) per gram from Total Acid Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.
**[40 C.F.R. §63.6625(j)]**

**[40 C.F.R. § 63.6625]**

## 6.3. Testing Requirements

6.3.1. NA

## 6.4. Recordkeeping Requirements

6.4.1. If the permittee must comply with the emission and operating limitations, the permittee must keep the following records:

a. A copy of each notification and report submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status submitted, according to the requirement in 40 CFR §**63**.10(b)(2)(xiv).

b. Records of the occurrence and duration of each malfunction of operation ( *i.e.*, process equipment) or the air pollution control and monitoring equipment.

c. Records of performance tests and performance evaluations as required in 40 CFR §**63**.10(b)(2)(viii).

d. Records of all required maintenance performed on the air pollution control and monitoring equipment.

e. Records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR §**63**.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

**[40 CFR §63.6655(a)]**

6.4.2. The permittee shall keep the records required in Table 6 (Item 9) of this subpart to show continuous compliance with each emission or operating limitation that applied.
**[40 CFR §63.6655(d)]**

6.4.3. The permittee must keep records of the maintenance conducted on each stationary RICE in order to demonstrate that the permittee operated and maintained each stationary RICE and after-treatment control device (if any) according to the permittee's own maintenance plan.
**[40 CFR §63.6655(e)(3)]**

## 6.5. Reporting Requirements

6.5.1. N/A

## 6.6. Compliance Plan

5.6.1 N/A

## 7.0 40 C.F.R. 63, Subpart ZZZZ GACT Requirements for Reciprocating Internal Combustion Engine(s) RICE greater than 500 hp at an Area Non-Remote HAP Source [Emission Unit IDs (01601, 01602)]

### 7.1 Limitations and Standards

7.1.1. The permittee must comply with the applicable emission and operating limitations in this section no later than October 19, 2013.
**[40 C.F.R. § 63.6595(a)]**

7.1.2. As stated in 40 C.F.R. §63.6603, the permittee must comply with the following requirements from Table 2d for existing stationary RICE located at area sources of HAP emissions:

| For each . . . | The permittee must meet the following requirements, except during periods of startup . . . |
|---|---|
| 9. Non-emergency, non-black start 4SLB stationary RICE >500 HP that are not remote stationary RICE and that operate more than 24 hours per calendar year | Install an oxidation catalyst to reduce HAP emissions from the stationary RICE |

**[40 C.F.R. §63.6603(a), Table 2d]**

7.1.3. The permittee shall comply with the following general requirements:

a. The permittee must be in compliance with the operating limitations in this subpart that apply to the permittee at all times.

b. At all times the permittee must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require the permittee to make any further efforts to reduce emissions if required levels have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

**[40 C.F.R. § 63.6605]**

7.1.4. You must conduct initial performance testing in accordance with Table 5, Condition 13.

| For each . . . | Complying with the requirement to . . . | You have demonstrated initial compliance if . . . |
|---|---|---|
| 13. Existing non-emergency 4SLB stationary RICE >500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year | a. Install an oxidation catalyst | i. You have conducted an initial compliance demonstration as specified in §63.6630(e) to show that the average reduction of emissions of CO is 93 percent or more, or the average CO concentration is less than or equal to 47 ppmvd at 15 percent $O_2$; |
| | | ii. You have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b), or you have installed equipment to automatically shut down the engine if the catalyst inlet temperature exceeds 1350 °F |

**[40 C.F.R. §63.6612(a), Table 5]**

7.1.5. (h) If you operate a new, reconstructed, or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Tables 1a, 2a, 2c, and 2d to this subpart apply.
**[40 C.F.R. § 63.6625(h)]**

7.1.6. (a) You must demonstrate continuous compliance with each emission limitation, operating limitation, and other requirements in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you according to methods specified in Table 6 to this subpart.

| For each . . . | Complying with the requirement to . . . | You must demonstrate continuous compliance by . . . |
|---|---|---|
| 14. Existing non-emergency 4SLB stationary RICE >500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year | a. Install an oxidation catalyst | i. Conducting annual compliance demonstrations as specified in §63.6640(c) to show that the average reduction of emissions of CO is 93 percent or more, or the average CO concentration is less than or equal to 47 ppmvd at 15 percent O2; and either<br>ii. Collecting the catalyst inlet temperature data according to §63.6625(b), reducing these data to 4-hour rolling averages; and maintaining the 4-hour rolling averages within the limitation of greater than 450 °F and less than or equal to 1350 °F for the catalyst inlet temperature; or<br>iii. Immediately shutting down the engine if the catalyst inlet temperature exceeds 1350 °F. |

**[40 C.F.R. §63.6640(a), Table 6]**

7.1.7. The permittee shall comply with all General Provisions which apply according to Table 8 to 40 C.F.R. Part 63, Subpart ZZZZ.
**[40 C.F.R. § 63.6665]**

## 7.2. Monitoring Requirements

7.2.1. The permittee shall monitor and collect data to demonstrate continuous compliance in accordance with the following:

(a) If you must comply with emission and operating limitations, you must monitor and collect data according to this section.

(b) Except for monitor malfunctions, associated repairs, required performance evaluations, and required quality assurance or control activities, you must monitor continuously at all times that the stationary RICE is operating. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

(c) You may not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels. You must, however, use all the valid data collected during all other periods.

**[40 C.F.R. § 63.6635]**

7.2.2. The permittee shall comply with the following monitoring provisions in accordance with §63.6625:

(b) If you are required to install a continuous parameter monitoring system (CPMS) as specified in Table 5 of this subpart, you must install, operate, and maintain each CPMS according to the requirements in paragraphs (b)(1) through (5) of this section. For an affected source that is complying with the emission limitations and operating limitations on March 9, 2011, the requirements in paragraph (b) of this section are applicable September 6, 2011.

(1) You must prepare a site-specific monitoring plan that addresses the monitoring system design, data collection, and the quality assurance and quality control elements outlined in paragraphs (b)(1)(i) through (v) of this section and in §**63**.8(d). As specified in §**63**.8(f)(4), you may request approval of monitoring system quality assurance and quality control procedures alternative to those specified in paragraphs (b)(1) through (5) of this section in your site-specific monitoring plan.

(i) The performance criteria and design specifications for the monitoring system equipment, including the sample interface, detector signal analyzer, and data acquisition and calculations;

(ii) Sampling interface ( *e.g.*, thermocouple) location such that the monitoring system will provide representative measurements;

(iii) Equipment performance evaluations, system accuracy audits, or other audit procedures;

(iv) Ongoing operation and maintenance procedures in accordance with provisions in §**63**.8(c)(1) and (c)(3); and

(v) Ongoing reporting and recordkeeping procedures in accordance with provisions in §**63**.10(c), (e)(1), and (e)(2)(i).

(2) You must install, operate, and maintain each CPMS in continuous operation according to the procedures in your site-specific monitoring plan.

(3) The CPMS must collect data at least once every 15 minutes (see also §63.6635).

(4) For a CPMS for measuring temperature range, the temperature sensor must have a minimum tolerance of 2.8 degrees Celsius (5 degrees Fahrenheit) or 1 percent of the measurement range, whichever is larger.

(5) You must conduct the CPMS equipment performance evaluation, system accuracy audits, or other audit procedures specified in your site-specific monitoring plan at least annually.

(6) You must conduct a performance evaluation of each CPMS in accordance with your site-specific monitoring plan.

(h) If you operate a new, reconstructed, or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Tables 1a, 2a, 2c, and 2d to this subpart apply.

**[40 C.F.R. § 63.6625]**

## 7.3. Testing Requirements

7.3.1. (e) The initial compliance demonstration required for existing non-emergency 4SLB and 4SRB stationary RICE with a site rating of more than 500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year must be conducted according to the following requirements:
(1) The compliance demonstration must consist of at least three test runs.
(2) Each test run must be of at least 15 minute duration, except that each test conducted using the method in appendix A to this subpart must consist of at least one measurement cycle and include at least 2 minutes of test data phase measurement.
(3) If you are demonstrating compliance with the CO concentration or CO percent reduction requirement, you must measure CO emissions using one of the CO measurement methods specified in Table 4 of this subpart, or using appendix A to this subpart.
(4) If you are demonstrating compliance with the THC percent reduction requirement, you must measure THC emissions using Method 25A, reported as propane, of 40 CFR part 60, appendix A.
(5) You must measure $O_2$ using one of the $O_2$ measurement methods specified in Table 4 of this subpart. Measurements to determine $O_2$ concentration must be made at the same time as the measurements for CO or THC concentration.
(6) If you are demonstrating compliance with the CO or THC percent reduction requirement, you must measure CO or THC emissions and $O_2$ emissions simultaneously at the inlet and outlet of the control device.

**[40 C.F.R. §63.6630(e)]**

7.3.2. (c) The annual compliance demonstration required for existing non-emergency 4SLB and 4SRB stationary RICE with a site rating of more than 500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year must be conducted according to the following requirements:
(1) The compliance demonstration must consist of at least one test run.
(2) Each test run must be of at least 15 minute duration, except that each test conducted using the method in appendix A to this subpart must consist of at least one measurement cycle and include at least 2 minutes

of test data phase measurement.

(3) If you are demonstrating compliance with the CO concentration or CO percent reduction requirement, you must measure CO emissions using one of the CO measurement methods specified in Table 4 of this subpart, or using appendix A to this subpart.

(4) If you are demonstrating compliance with the THC percent reduction requirement, you must measure THC emissions using Method 25A, reported as propane, of 40 CFR part 60, appendix A.

(5) You must measure $O_2$ using one of the $O_2$ measurement methods specified in Table 4 of this subpart. Measurements to determine $O_2$ concentration must be made at the same time as the measurements for CO or THC concentration.

(6) If you are demonstrating compliance with the CO or THC percent reduction requirement, you must measure CO or THC emissions and $O_2$ emissions simultaneously at the inlet and outlet of the control device.

(7) If the results of the annual compliance demonstration show that the emissions exceed the levels specified in Table 6 of this subpart, the stationary RICE must be shut down as soon as safely possible, and appropriate corrective action must be taken (e.g., repairs, catalyst cleaning, catalyst replacement). The stationary RICE must be retested within 7 days of being restarted and the emissions must meet the levels specified in Table 6 of this subpart. If the retest shows that the emissions continue to exceed the specified levels, the stationary RICE must again be shut down as soon as safely possible, and the stationary RICE may not operate, except for purposes of startup and testing, until the owner/operator demonstrates through testing that the emissions do not exceed the levels specified in Table 6 of this subpart.

**[40 C.F.R. §63.6640(c)]**

## 7.4. Recordkeeping Requirements

7.4.1. If the permittee must comply with the emission and operating limitations, the permittee must keep the following records:

a. A copy of each notification and report submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status submitted, according to the requirement in 40 CFR §**63**.10(b)(2)(xiv).

b. Records of the occurrence and duration of each malfunction of operation ( *i.e.*, process equipment) or the air pollution control and monitoring equipment.

c. Records of performance tests and performance evaluations as required in 40 CFR §**63**.10(b)(2)(viii).

d. Records of all required maintenance performed on the air pollution control and monitoring equipment.

e. Records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR §**63**.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

**[40 CFR §63.6655(a)]**

7.4.2. You must keep the records required in Table 6 of this subpart to show continuous compliance with each emission or operating limitation that applies to you.

**[40 CFR §63.6655(d)]**

## 7.5. Reporting Requirements

7.5.1. (h) If you are required to conduct a performance test or other initial compliance demonstration as specified in Tables 4 and 5 to this subpart, you must submit a Notification of Compliance Status according to §63.9(h)(2)(ii).

(1) For each initial compliance demonstration required in Table 5 to this subpart that does not include a performance test, you must submit the Notification of Compliance Status before the close of business on the 30th day following the completion of the initial compliance demonstration.

**[40 CFR §63.6645(h)(1)]**

7.5.2. You must submit each report in Table 7 of this subpart that applies to you.

| For each . . . | You must submit a . . . | The report must contain . . . | You must submit the report . . . |
|---|---|---|---|
| 3. Existing non-emergency, non-black start 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP that are not remote stationary RICE and that operate more than 24 hours per calendar year | Compliance report | a. The results of the annual compliance demonstration, if conducted during the reporting period. | i. Semiannually according to the requirements in §63.6650(b)(1)-(5). |

**[40 CFR §63.6650(a), Table 7, Condition 3]**

7.5.3. In accordance with 40 C.F.R. §63.6650 the permittee shall submit the following reports:

(b) Unless the Administrator has approved a different schedule for submission of reports under §**63**.10(a), you must submit each report by the date in Table 7 of this subpart and according to the requirements in paragraphs (b)(1) through (b)(9) of this section.

(1) For semiannual Compliance reports, the first Compliance report must cover the period beginning on the compliance date that is specified for your affected source in §**63**.6595 and ending on June 30 or December 31, whichever date is the first date following the end of the first calendar half after the compliance date that is specified for your source in §**63**.6595.

(2) For semiannual Compliance reports, the first Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date follows the end of the first calendar half after the compliance date that is specified for your affected source in §**63**.6595.

(3) For semiannual Compliance reports, each subsequent Compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31.

(4) For semiannual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date is the first date following the end of the semiannual reporting period.

(5) For each stationary RICE that is subject to permitting regulations pursuant to 40 CFR part 70 or 71, and if the permitting authority has established dates for submitting semiannual reports pursuant to 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6 (a)(3)(iii)(A), you may submit the first and subsequent Compliance reports according to the dates the permitting authority has established instead of according to the dates in paragraphs (b)(1) through (b)(4) of this section.

(c) The Compliance report must contain the information in paragraphs (c)(1) through (6) of this section.

(1) Company name and address.

(2) Statement by a responsible official, with that official's name, title, and signature, certifying the accuracy of the content of the report.

(3) Date of report and beginning and ending dates of the reporting period.

(4) If you had a malfunction during the reporting period, the compliance report must include the number, duration, and a brief description for each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded. The report must also include a description of actions taken by an owner or operator during a malfunction of an affected source to minimize emissions in accordance with §**63**.6605(b), including actions taken to correct a malfunction.

(5) If there are no deviations from any emission or operating limitations that apply to you, a statement that there were no deviations from the emission or operating limitations during the reporting period.

(6) If there were no periods during which the continuous monitoring system (CMS), including CEMS and CPMS, was out-of-control, as specified in §**63**.8(c)(7), a statement that there were no periods during which the CMS was out-of-control during the reporting period.

(d) For each deviation from an emission or operating limitation that occurs for a stationary RICE where you are not using a CMS to comply with the emission or operating limitations in this subpart, the Compliance report must contain the information in paragraphs (c)(1) through (4) of this section and the information in paragraphs (d)(1) and (2) of this section.

(1) The total operating time of the stationary RICE at which the deviation occurred during the reporting period.

(2) Information on the number, duration, and cause of deviations (including unknown cause, if applicable), as applicable, and the corrective action taken.

(e) For each deviation from an emission or operating limitation occurring for a stationary RICE where you are using a CMS to comply with the emission and operating limitations in this subpart, you must include information in paragraphs (c)(1) through (4) and (e)(1) through (12) of this section.

(1) The date and time that each malfunction started and stopped.

(2) The date, time, and duration that each CMS was inoperative, except for zero (low-level) and high-level checks.

(3) The date, time, and duration that each CMS was out-of-control, including the information in §**63**.8(c)(8).

(4) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of malfunction or during another period.

(5) A summary of the total duration of the deviation during the reporting period, and the total duration as a percent of the total source operating time during that reporting period.

(6) A breakdown of the total duration of the deviations during the reporting period into those that are due to control equipment problems, process problems, other known causes, and other unknown causes.

(7) A summary of the total duration of CMS downtime during the reporting period, and the total duration of CMS downtime as a percent of the total operating time of the stationary RICE at which the CMS downtime occurred during that reporting period.

(8) An identification of each parameter and pollutant (CO or formaldehyde) that was monitored at the stationary RICE.

(9) A brief description of the stationary RICE.

(10) A brief description of the CMS.

(11) The date of the latest CMS certification or audit.

(12) A description of any changes in CMS, processes, or controls since the last reporting period.

(f) Each affected source that has obtained a title V operating permit pursuant to 40 CFR part 70 or 71 must report all deviations as defined in this subpart in the semiannual monitoring report required by 40 CFR 70.6 (a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A). If an affected source submits a

Compliance report pursuant to Table 7 of this subpart along with, or as part of, the semiannual monitoring report required by 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A), and the Compliance report includes all required information concerning deviations from any emission or operating limitation in this subpart, submission of the Compliance report shall be deemed to satisfy any obligation to report the same deviations in the semiannual monitoring report. However, submission of a Compliance report shall not otherwise affect any obligation the affected source may have to report deviations from permit requirements to the permit authority.

**[40 CFR §63.6650]**

## 7.6. Compliance Plan

7.6.1 N/A

## 8.0 Source-Specific Requirements for Natural Gas Dehydration Controlled by a Flare and Meeting the Exemption Requirement of 40 C.F.R. 63 Subpart HH [Emission Unit ID (TEGDEHY1)]

### 8.1. Limitations and Standards

8.1.1. No person shall cause, suffer, allow or permit particulate matter to be discharged from any incinerator into the open air in excess of the quantity determined by use of the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)
Where, the factor, F, is as indicated in Table I below:
Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions
Incinerator Capacity: Factor F
A. Less than 15,000 lbs/hr 5.43
B. 15,000 lbs/hr or greater 2.72

*Calculation for PM Emissions:*

(5.43) x (40.74 lb/hr) / (2000 lb/ton)

= 0.11 lb/hr

**[45CSR§6-4.1][FL1]**

8.1.2. No person shall cause, suffer, allow or permit the emission of particles of unburned or partially burned refuse or ash from any incinerator which are large enough to be individually distinguished in the open air. **[45CSR§6-4.5][F1]**

8.1.3. Flare (FL1) subject to this section shall be designed and operated in accordance with the following:

a Flare (FL1) shall be non-assisted, steam-assisted or air assisted

b. Flare (FL1) shall be designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

c. Flare (FL1) shall be operated, with a flame present at all times whenever emissions may be vented to it, except during SSM (Startup, Shutdown, Malfunctions) events.

d. A flare shall be used only where the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or where the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater if the flare is non-assisted. The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K \sum_{i=1}^{n} C_i H_i$$

Where:
$H_T$=Net heating value of the sample, MJ/scm; where the net enthalpy per mole of off gas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C.

K=Constant=

$$1.740\times10^{-7}\left(\frac{1}{ppmv}\right)\left(\frac{g\text{-}mole}{scm}\right)\left(\frac{MJ}{kcal}\right)$$

where the standard temperature for (g-mole/scm) is 20 °C.
$C_i$=Concentration of sample component i in ppmv on a wet basis, which may be measured for organics by Test Method 18, but is not required to be measured using Method 18 (unless designated by the Director).
$H_i$=Net heat of combustion of sample component i, kcal/g-mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382–76 or 88 or D4809–95 if published values are not available or cannot be calculated.
n=Number of sample components.

e. Steam-assisted and nonassisted flares shall be designed for and operated with an exit velocity less than 18.3 m/sec (60 ft/sec), except as provided by 5.1.6.f and 5.1.6.g of this section. The actual exit velocity of a flare shall be determined by dividing by the volumetric flow rate of gas being combusted (in units of emission standard temperature and pressure), by the unobstructed (free) cross-sectional area of the flare tip, which may be determined by Test Method 2, 2A, 2C, or 2D in appendix A to 40 CFR part 60, as appropriate, but is not required to be determined using these Methods (unless designated by the Director).

f. Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in 5.1.6.e. of this section, equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec), are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

g. Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in 8.1.6.e. of this section, less than the velocity $V_{max}$, as determined by the calculation specified in this paragraph, but less than 122 m/sec (400 ft/sec) are allowed. The maximum permitted velocity, $V_{max}$, for flares complying with this paragraph shall be determined by the following equation:

$$Log_{10}(V_{max})=(H_T+28.8)/31.7$$

Where:
$V_{max}$=Maximum permitted velocity, m/sec.
28.8=Constant.
31.7=Constant.
$H_T$=The net heating value as determined in d of this section
[**45CSR13, R13-2479, 4.1.9]**

8.1.4. The permittee is not required to conduct a flare compliance assessment for concentration of sample (i.e. Method 18) and tip velocity (i.e. Method 2) until such time as the Director requests a flare compliance assessment to be conducted in accordance with section 8.3.3, but the permittee is required to conduct a flare design evaluation in accordance with section 8.4.3. Alternatively, the permittee may elect to demonstrate compliance with the flare design criteria requirements of section 8.1.6. by complying with the compliance assessment testing requirements of section 8.3.3.
[**45CSR30-5.1.c]**

8.1.5. Visible particulate matter emissions from the flare (F1) shall not exceed twenty (20%) percent opacity.
*Compliance with this requirement shall be streamlined by demonstrating compliance with the no visible emission provision incorporated for flares under 8.1.3.b.*
**[45CSR§6-4.3]**

8.1.6. The provisions of permit condition 8.1.8 shall not apply to smoke which is less than forty (40%) percent opacity, for a period or periods aggregating no more than eight (8) minutes per start-up.
*Compliance with this requirement shall be streamlined by demonstrating compliance with the no visible emission provision incorporated for flares under 8.1.3.b.*
**[45CSR§6-4.4]**

8.1.7. The flare (F1) including all associated equipment and grounds, shall be designed, operated and maintained so as to prevent the emission of objectionable odors.
**[45CSR§6-4.6]**

8.1.8. The permittee has defined the facility as a minor source of HAPs for MACT applicability purposes. As a result the subject facility shall conduct monitoring, testing, and reporting as specified below in order to provide adequate justification for maintaining minor source status. This requirement shall in no way restrict the permittee from conducting more frequent testing to quantify emissions increases.
**[40CFR§63.10(b)(3); 45CSR34]**

8.1.9. *§ 63.764 General standards.*

(a) Table 2 of the Part 63 Subpart HH specifies the provisions of subpart A (General Provisions) of Part 63 that apply and those that do not apply to owners and operators of affected sources subject to this subpart.

(b) All reports required under this subpart shall be sent to the Administrator at the appropriate address listed in §63.13. Reports may be submitted on electronic media.

(d) Except as specified in paragraph (e)(1) of this requirement, the owner or operator of an affected source located at an existing or new area source of HAP emissions shall comply with the applicable standards specified in paragraph (d) of this section.

(2) Each owner or operator of an area source not located in a UA plus offset and UC boundary (as defined in §63.761) shall comply with paragraphs (d)(2)(i) through (iii) of this requirement.

(i) Determine the optimum glycol circulation rate using the following equation:

$$L_{OPT} = 1.15 * 3.0 \frac{\text{gal TEG}}{\text{lb } H_2O} * \left( \frac{F * (I - O)}{24 \text{ hr/day}} \right)$$

Where:

$L_{OPT}$= Optimal circulation rate, gal/hr.

F = Gas flowrate (MMSCF/D).

I = Inlet water content (lb/MMSCF).

O = Outlet water content (lb/MMSCF).

3.0 = The industry accepted rule of thumb for a TEG-to water ratio (gal TEG/lb $H_2O$).

1.15 = Adjustment factor included for a margin of safety.

(ii) Operate the TEG dehydration unit such that the actual glycol circulation rate does not exceed the optimum glycol circulation rate determined in accordance with paragraph (d)(2)(i) of this section. If the TEG dehydration unit is unable to meet the sales gas specification for moisture content using the glycol circulation rate determined in accordance with paragraph (d)(2)(i), the owner or operator must calculate an alternate circulation rate using GRI–GLYCalc™ , Version 3.0 or higher. The owner or operator must document why the TEG dehydration unit must be operated

using the alternate circulation rate and submit this documentation with the initial notification in accordance with §63.775(c)(7).

(iii) Maintain a record of the determination specified in paragraph (d)(2)(ii) in accordance with the requirements in §63.774(f) and submit the Initial Notification in accordance with the requirements in §63.775(c)(7). If operating conditions change and a modification to the optimum glycol circulation rate is required, the owner or operator shall prepare a new determination in accordance with paragraph (d)(2)(i) or (ii) of this section and submit the information specified under §63.775(c)(7)(ii) through (v).

(e) *Exemptions.* (1) The owner or operator is exempt from the requirements of paragraph (d) of this section if the criteria listed in paragraph (e)(1)(ii) of this section are met, except that the records of the determination of these criteria must be maintained as required in §63.774(d)(1).

(ii) 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/yr), as determined by the procedures specified in §63.772(b)(2) of this subpart.

**[40CFR§63.764(a), (b), (d), (e)]**

8.1.10. If the annual emissions of benzene from the dehydration unit ever equals or exceeds 0.90 megagram per year (1 tpy) as calculated per §63.772(b)(2), the permittee shall comply with section d(2)(i) through (iii) of §63.764 **(**requirement 8.1.13).

**[45CSR§30-5.1.c]**

## 8.2. Monitoring Requirements

8.2.1. In order to demonstrate compliance with the area source status, claimed within 8.1.4, 8.1.5, 8.1.11, as well as the 1 ton per year benzene exemption provided under 8.1.13(e)(1)(ii) using GRI-GLYCalc V3 or higher, the dehydration system must be accurately defined by monitoring and recording actual operating parameters associated with the dehydration system. These parameters shall be measured periodically, with the exception of wet gas composition, in order to define annual average values or, if monitoring is not practical, some parameters may be assigned default values as listed below. Periodically, shall be interpreted as sufficient enough to reflect annual variation and, therefore, this term is operating parameter and site dependent.

The WV Division of Air Quality requires the following actual operating parameters be measured or assumed to equal the default values listed below in order to satisfy this monitoring requirement when using the Gas Analysis and Process Data, GLYCalc emission modeling method:

- Natural Gas Flowrate:
  - number of days operated per year,
  - annual daily average (MMscf/day), and
  - maximum design capacity (MMscf/day)
- Absorber temperature and pressure
- Lean glycol circulation rate
- Glycol pump type
- Flash tank temperature and pressure, if applicable
- Stripping Gas flow rate, if applicable

- Wet gas composition (upstream of the absorber – dehydration column) Sampled in accordance with GPA method 2166 and analyzed consistent with GPA extended method 2286 as well as the procedures presented in the GRI-GLYCalc Technical Reference User Manual and Handbook V4.

The following operating parameter**(s)** may be assigned default values when using GRI-GLYCalc:

- Dry Gas water content if not measured at a point directly after exiting the dehydration column and before any additional separation points can be assumed pipeline quality at 7 lb $H_2O$ / MMscf.
- Lean glycol water content if not directly measured may use the default value of 1.5 % water as established by GRI.
- Lean glycol circulation rate may be estimated using the recirculation ratio of 3 gal TEG / lb $H_2O$ removed unless utilizing site specific inlet and outlet dew points. In this case the actual TEG recirculation rate shall be monitored to define a representative annual average.
- Additionally, the maximum TEG pump rate based on the unit's design capacity shall be used when determining major source HAP Potential to Emit (PTE).

**[45CSR§30-5.1.c]**

8.2.2. In order to demonstrate compliance with the requirements of 8.1.6.c, the permittee shall monitor the presence or absence of a flare pilot flame using a thermocouple or any other equivalent device, except during SSM events.
**[45CSR§30-5.1.c]**

## 8.3. Testing Requirements

8.3.1. The permittee shall determine the composition of the wet natural gas by sampling in accordance with GPA Method 2166 and analyzing according to extended GPA Method 2286 analysis as specified in the GRI-GLYCalc V4 Technical Reference User Manual and Handbook. As specified in the handbook, the permittee shall sample the wet gas stream at a location prior to the glycol dehydration contactor column, but after any type of separation device, in accordance with GPA method 2166. The permittee may utilize other equivalent methods provided they are approved in advance by DAQ as part of a testing protocol. If alternative methods are proposed, a test protocol shall be submitted for approval no later than 60 days before the scheduled test date.
**[45CSR§30-5.1.c]**

8.3.2. In order to demonstrate compliance with the flare opacity requirements of 8.1.3.b the permittee shall conduct a Method 22 opacity test for at least two hours. This test shall demonstrate no visible emissions are observed for more than a total aggregate of five (5) minutes during any 2 consecutive hour period using 40CFR60, Appendix A, Method 22. The permittee shall conduct this test within one (1) year of permit issuance or initial startup whichever is later. The visible emission checks shall determine the presence or absence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40 CFR part 60, appendix A, Method 22 or from the lecture portion of 40 CFR part 60, appendix A, Method 9 certification course.

Additionally, at any time the flare is in operation and opacity is observed from the flare, the cause of excess opacity shall be assessed and a Method 22 visual emissions reading shall be conducted within 48 hours of the initial observation. The Method 22 readings shall be conducted for an amount of time adequate to assess whether visible emissions are present for a period of time greater than an aggregate of five (5) minutes over any two (2) consecutive hour period. If visible emissions are present for an aggregate of 5 minutes or greater as stated above, the source will be in violation of permit condition 8.1.6.b. At this time, the permittee shall then be required to assess compliance with the 20% opacity requirement of 45CSR6 using a certified Method 9 observer as soon as practicable.

Regardless of whether the flare meets the 20% opacity limit of 45CSR6, compliance with the "no visible emission requirement" of permit condition (8.1.3.b) will be considered, in violation, if emissions are observed for an aggregate of more than 5 minutes within any two (2) consecutive hour timeframe. Therefore, the permittee shall be required to submit the notification requirements as defined within 8.5.1 of this permit. If timing allows the results of the Method 9 observation(s) related to the compliance assessment for 45CSR6 shall also be submitted as part of the notification.

[**45CSR§30-5.1.c]**

8.3.3. The following testing and compliance provisions of Part 63 Subpart HH *National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities* are applicable to the facility:

*§ 63.772 Test methods, compliance procedures, and compliance demonstrations.*

*(b) Determination of glycol dehydration unit flowrate or benzene emissions.* The procedures of this paragraph shall be used by an owner or operator to determine glycol dehydration unit natural gas flowrate or benzene emissions to meet the criteria for an exemption from control requirements under §63.764(e)(1) (requirement 9.1.13).

(2) The determination of actual average benzene emissions from a glycol dehydration unit shall be made using the procedures of paragraph (b)(2)(i) of this requirement. Emissions shall be determined either uncontrolled, or with federally enforceable controls in place.

(i) The owner or operator shall determine actual average benzene emissions using the model GRI-GLYCalc™ , Version 3.0 or higher, and the procedures presented in the associated GRI-GLYCalc™ Technical Reference Manual. Inputs to the model shall be representative of actual operating conditions of the glycol dehydration unit.

**[40CFR§63.772 (b)(2)(i)]**

## 8.4. Recordkeeping Requirements

8.4.1. For the purpose of documenting compliance with the emission limitations, HAP major source thresholds, as well as the 1 ton per year benzene exemption, the permittee shall maintain records of all monitoring data, wet gas sampling, and annual GLYCalc emission estimates.
**[45CSR§30-5.1.c]**

8.4.2. For the purpose of demonstrating compliance with section 8.1.3.c and 8.2.2, the permittee shall maintain records of the times and duration of all periods which the pilot flame was absent.

8.4.3. For the purpose of demonstrating compliance with the flare design criteria within section 8.1.3.d and 8.1.3.g the permittee shall maintain a record of the flare design evaluation. The flare design evaluation shall include, net heat value calculations, exit (tip) velocity calculations, and all supporting concentration calculations and other related information requested by the Director. If the Method 18 and Method 2 flare testing requirements are not specifically requested by the Director, then the permittee shall use GLYCalc software to predict the waste gas heating value and tip velocity to be used for the design evaluation.
[**45CSR§30-5.1.c.]**

8.4.6. For the purpose of demonstrating compliance with section 8.1.3.b, the permittee shall maintain records of the visible emission opacity tests conducted per Section 8.3.2.
[**45CSR§30-5.1.c]**

## 8.5. Reporting Requirements

8.5.1. Any violation(s)/deviation(s) of the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 or Method 22 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days, of the occurrence and shall include, at least the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s)/deviation(s), and any corrective measures taken or planned.
**[45CSR§30-5.1.c]**

## 8.6. Compliance Plan

N/A

## 9.0 45 CSR 13 NSR Permit Requirements, R13-2479 [Emission Unit ID9s) (01601, 01602, 01603, 016G2, TEGDEHY1, BLR1 & FLLP1)]

### 9.1 Limitations and Standards

9.1.1. The emissions from the 1,320 horsepower Ingersoll-Rand Model 48KVS 4 - cycle lean burn reciprocating natural gas fired compressor engine with turbocharger conversion, ID No. 01601 (Emission Point ID No. E01) shall not exceed the following:

| Pollutant | Pounds/Hour | Tons/Year |
|---|---|---|
| CO | 5.56 | 22.14 |
| $NO_x$ | 35.00 | 41.30 |
| $PM_{10}$ | 0.01 | 0.01 |
| $SO_2$ | 0.70 | 0.30 |
| VOCs | 1.44 | 5.73 |
| Formaldehyde | 0.64 | 2.57 |
| Benzene | 0.01 | 0.02 |

**[45CSR13, R13-2479, Condition 4.1.1, Emission Unit ID (01601)]**

9.1.2. The emissions from the 1,320 horsepower Ingersoll-Rand Model 48KVS 4 - cycle lean burn reciprocating natural gas fired compressor engine with turbocharger conversion, ID No. 01602 (Emission Point No. E02) shall not exceed the following:

| Pollutant | Pounds/Hour | Tons/Year |
|---|---|---|
| CO | 5.56 | 22.14 |
| $NO_x$ | 35 | 41.3 |
| $PM_{10}$ | 0.01 | 0.01 |
| $SO_2$ | 0.70 | 0.30 |
| VOCs | 1.44 | 5.73 |
| Formaldehyde | 0.64 | 2.57 |
| Benzene | 0.01 | 0.02 |

**[45CSR13, R13-2479, Condition 4.1.2, Emission Unit ID (01602)]**

9.1.3. The emissions from the 600 horsepower Clark Model RA-6, 2 cycle lean burn natural gas fired compressor engine, ID No. 01603 (Emission Point ID No. E03) shall not exceed the following:

| Pollutant | Pounds/Hour | Tons/Year |
|---|---|---|
| CO | 4.1 | 8.1 |
| $NO_x$ | 7.25 | 15.9 |
| $PM_{10}$ | 0.28 | 0.555 |
| $SO_2$ | 0.46 | 0.063 |
| VOCs | 0.87 | 1.73 |
| Formaldehyde | 0.4 | 0.8 |
| Benzene | 0.01 | 0.03 |

**[45CSR13, R13-2479, Condition 4.1.3, Emission Unit ID (01603)]**

9.1.4. The 600 horsepower engine (ID No. 01603) shall be limited to 4,380 hours of operation per year. Compliance shall be determined using a 12-month rolling total. A 12-month rolling total shall mean the sum of operating hours at any given time for the previous twelve (12) calendar months.
**[45CSR13, R13-2479, Condition 4.1.4, Emission Unit ID (01603)]**

9.1.5. Each of the two 1,320 horsepower Ingersoll-Rand Model 48KVS engines, ID No. 01601 and ID No. 01602, shall not exceed in any calendar month an average hourly fuel consumption of 12,197 cubic feet of natural gas per hour nor 97,130,880 cubic feet of natural gas per year each. Compliance with the hourly consumption limit shall be determined using average hourly fuel consumption determined on a per month basis. Compliance with the annual consumption limit shall be determined using a 12-month rolling total. A 12-month rolling total shall mean the sum of natural gas consumed at any given time for the previous twelve (12) calendar months.
**[45CSR13, R13-2479, Condition 4.1.5, Emission Unit IDs (01601, 01602)]**

9.1.6. The 600 horsepower Clark Model RA-6 engine, ID No. 01603, shall not exceed in any calendar month an average hourly fuel consumption of 7,260 cubic feet of natural gas per hour nor 28,908,000 cubic feet of natural gas per year. Compliance with the hourly consumption limit shall be determined using average hourly fuel consumption determined on a per month basis. Compliance with the annual consumption limit shall be determined using a 12-month rolling total. A 12-month rolling total shall mean the sum of natural gas consumed at any given time for the previous twelve (12) calendar months.
**[45CSR13, R13-2479, Condition 4.1.6, Emission Unit ID (01603)]**

9.1.7. The 1.0 MM Btu/hr NATCO Model SHV-2.5 dehydrator flare (Equip. ID No. FLLP1, Emission Point ID No. FL1) shall be operated at all times when emissions may be vented to it.
**[45CSR13, R13-2479, Condition 4.1.7, Emission Unit ID (FLLP1)]**

9.1.8. Emissions from the dehydrator flare shall not exceed the maximum hourly and annual emission rates specified below:

| **Pollutant** | | **Maximum Emission Rates** | |
|---|---|---|---|
| | | **(lb/hr)** | **(ton/yr)[(1)]** |
| Carbon Monoxide (CO) | | 0.37 | 1.62 |
| Nitrogen Oxide ($NO_x$) | | 0.07 | 0.30 |
| Particulate Matter less than 10 micron ($PM_{10}$) | | 0.01 | 0.01 |
| Sulfur Dioxide ($SO_2$) | | 0.06 | 0.25 |
| Volatile Organic Compounds (VOC) | | 2.09 | 9.15 |
| Hazardous Air Pollutants (HAPs) | Benzene | 0.68 | 2.99 |
| | Toluene | 0.078 | 0.34 |
| | Ethylbenzene | 0.031 | 0.14 |
| | Hexane | 0.024 | 0.11 |
| | Xylene | 0.15 | 0.66 |
| | Total | 0.96 | 4.24 |

(1) Based on 8,760 hr/yr of operation.

**[45CSR13, R13-2479, Condition 4.1.8, Emission Unit ID (FLLP1)]**

9.1.9. The dehydrator flare shall be operated so as to reduce HAP emissions by 95.0 percent by weight or more. The dehydrator flare shall be operated in accordance with 40 CFR 60.18 "General Control Device Requirements" paragraphs (c) through (f).
**[45CSR13, R13-2479, Condition 4.1.9, Emission Unit ID (FLLP1)]**

9.1.10. The net heating value of the gas being flared by the dehydrator flare shall be 200 Btu/scf or greater.
**[45CSR13, R13-2479, Condition 4.1.10, Emission Unit ID (FLLP1)]**

9.1.11. The 229 hp natural gas-powered Waukesha, model VSG11GSI-F11GSI reciprocating engine/emergency generator set shall not be run greater than 1,000 hours per year (hr/yr).
**[45CSR13, R13-2479, Condition 4.1.11, Emission Unit ID (016G2)]**

9.1.12. Emissions from the 229 hp natural gas-powered Waukesha engine/generator set, Emission Point ID No. G2, shall not exceed the maximum hourly and annual emission rates specified below:

| Pollutant | Emission Factor (lb/(hp-hr)) | Safety Factor/ Multiplier | Maximum Emission Rates | |
|---|---|---|---|---|
| | | | (lb/hr) | (ton/yr) [5] |
| $NO_x$ | 0.0209 (1) | 2 | 9.6 | 4.80 |
| CO | 0.0771 (1) | 2 | 35.3 | 17.64 |
| PM | 0.000243 (2) | 2 | 0.11 | 0.05 |
| $SO_x$ | 0.000476 (3)<br>0.00004482 (4) | 1 | 0.11 | 0.01 |
| VOC | 0.000551 (1) | 2 | 0.25 | 0.12 |

(1) Emission Factors from engine/generator vendor: Waukesha Performance Data EN 123825, 4/99.
(2) AP42, uncontrolled lean-burn engines, Table 3.2-2, 10/96 at 7,500 Btu/hp-hr.
(3) Engineering calculation based on 20 grains Sulfur/100 scf.
(4) Engineering calculation based on 2.0 grains Sulfur/100 scf.
(5) Based on 1,000 hours per year of operation.

**[45CSR13, R13-2479, Condition 4.1.12, Emission Unit ID (016G2)]**

9.1.13. Compliance with the hourly SO2 limits set forth in Source Specific Requirements 8.1.1., 8.1.2., and 8.1.3 shall be demonstrated by maintaining average hourly total sulfur content of fuel gas at or less than 20 grains of sulfur per 100 standard cubic feet of fuel gas.
**[45CSR13, R13-2479, Condition 4.1.13, Emission Unit IDs (01601, 01602, 01603)]**

9.1.14. Compliance with the SO2 annual limits set forth in Source Specific Requirements 8.1.1., 8.1.2., and 8.1.3. shall be demonstrated by maintaining an average total sulfur content of fuel gas at or less than 2.0 grains of sulfur per 100 standard cubic feet of fuel gas. An average total sulfur content of fuel gas shall be determined once per quarter for the first 2 (two) years upon issuance of this Permit. If compliance with2.0 grains of sulfur per 100 standard cubic feet of fuel gas is demonstrated for two consecutive years, then sulfur content of fuel gas shall be determined annually. Anytime when not in compliance with the 2.0 grains of sulfur per 100 standard cubic feet of fuel gas, then monitoring of sulfur content shall revert back to the quarterly frequency requirement and begin the progressive monitoring cycle again.
**[45CSR13, R13-2479, Condition 4.1.14, Emission Unit IDs (01601, 01602, 01603)]**

9.1.15. The pertinent sections of 45CSR4 applicable to this facility include, but are not limited to, the following:

§45-4-3.1.
No person shall cause, suffer, allow or permit the discharge of air pollutants which causes or contribute to an objectionable odor at any location occupied by the public.

§45-4-4.1.
Accidental and other infrequent discharge which cause or contribute to objectionable odors will be

considered on an individual basis and shall be reported by the person responsible therefore to the Commission in the manner to be prescribed by the Commission.

9.1.16. The pertinent sections of 45CSR6 applicable to this facility include, but are not limited to, the following:

§45-6-4.6
Incinerators, including all associated equipment and grounds, shall be designed, operated and maintained so as to prevent the emission of objectionable odors.

§45-6-6.1
No person shall construct, modify or relocate any incinerator without first obtaining a permit in accordance with the provisions of W. Va. Code §§22-5-1 et seq. and 45CSR13.

§45-6-8.2
Due to unavoidable malfunction of equipment, emissions exceeding those provided for in this rule maybe permitted by the Director for periods not the exceed five (5) days upon specific application to the Director. Such application shall be made within twenty-four (24) hours of the malfunction. In cases of major equipment failure, additional time periods may be granted by the Director provided a corrective program has been submitted by the owner or operator and approved by the Director.

9.1.17. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
**[45CSR§13-5.11.]**

9.1.18. The Dehydrator Flare, NATCO Model SHV-2.5 (FLLP1) subject to this section shall be designed and operated in accordance with the following:

a. Flares shall be steam-assisted, air-assisted, or non-assisted.

b. Flares shall be designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

c. Flares shall be operated, with a flame present at all times whenever emissions may be vented to them, except during SSM (Startup, Shutdown, Malfunctions) events.

d. A flare shall be used only where the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or where the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater if the flares is non-assisted. The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K\sum_{i=1}^{n} C_i H_i$$

Where:
$H_T$=Net heating value of the sample, MJ/scm; where the net enthalpy per mole of off gas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C.

K=Constant=

$$1.740\times10^{-7}\left(\frac{1}{ppmv}\right)\left(\frac{g\text{-}mole}{scm}\right)\left(\frac{MJ}{kcal}\right)$$

where the standard temperature for (g-mole/scm) is 20 °C.

$C_i$=Concentration of sample component i in ppmv on a wet basis, which may be measured for organics by Test Method 18, but is not required to be measured using Method 18 (unless designated by the Director).

$H_i$=Net heat of combustion of sample component i, kcal/g-mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382–76 or 88 or D4809–95 if published values are not available or cannot be calculated.

n=Number of sample components.

e. Steam-assisted and nonassisted flares shall be designed for and operated with an exit velocity less than 18.3 m/sec (60 ft/sec), except as provided by 7.1.2.f and 7.1.2.g of this section. The actual exit velocity of a flare shall be determined by dividing by the volumetric flow rate of gas being combusted (in units of emission standard temperature and pressure), by the unobstructed (free) cross-sectional area of the flare tip, which may be determined by Test Method 2, 2A, 2C, or 2D in appendix A to 40 CFR part 60, as appropriate, but is not required to be determined using these Methods (unless designated by the Director).

f. Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in 7.1.2.e. of this section, equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec), are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

g. Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in 7.1.2.e. of this section, less than the velocity $V_{max}$, as determined by the calculation specified in this paragraph, but less than 122 m/sec (400 ft/sec) are allowed. The maximum permitted velocity, $V_{max}$, for flares complying with this paragraph shall be determined by the following equation:

$$Log_{10}(V_{max})=(H_T+28.8)/31.7$$

Where:

$V_{max}$=Maximum permitted velocity, m/sec.

28.8=Constant.

31.7=Constant.

$H_T$=The net heating value as determined in 7.1.2.d of this section

h. Air-assisted flares shall be designed and operated with an exit velocity less than the velocity $V_{max}$. The maximum permitted velocity, $V_{max}$, for air-assisted flares shall be determined by the following equation:

$$V_{max}=8.71 + 0.708(H_T)$$

Where:

$V_{max}$=Maximum permitted velocity, m/sec.

8.71=Constant.

0.708=Constant.

$H_T$=The net heating value as determined in 7.1.2.d of this section.

**[45CSR13, R13-2149C, Condition 7.1.1, Emission Unit ID (FLLP1)]**

## 9.2 Monitoring Requirements

9.2.1. The 1.0 MM Btu/hr NATCO Model SHV-2.5 dehydrator flare's pilot flame shall be electronically monitored with spark recognition.

## 9.3 Testing Requirements

9.3.1. In order to demonstrate compliance with the 45CSR10-5.1. an annual fuel gas sampling analysis for hydrogen sulfide shall be obtained. Said records shall be maintained on site for a period of five (5) years, and shall be made available to the Director of the Division of Air Quality or his/her duly authorized representative upon request and shall be certified by a responsible official upon the submittal. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. When appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

9.3.2. In order to demonstrate compliance with Source Specific Requirements 4.1.13 and 4.1.14, sampling analyses for total sulfur shall be obtained. Said records shall be maintained on site for a period of five (5) years, and shall be made available to the Director of the Division of Air Quality or his/her duly authorized representative upon request and shall be certified by a responsible official upon the submittal. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. When appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

9.3.3. Upon request, tests to determine compliance with the emission limitations set forth in this permit shall be conducted in accordance with the methods as set forth below. The Director may require a different test method or approve an alternative method in light of any technology advancements that may occur. Compliance testing shall be conducted at, or near, 100% of the peak load. The permittee may request an alternative test procedure with a written submittal (protocol) to the Director.

a) Tests to determine compliance with NOx emission limits shall be conducted in accordance with Method 7, 7A, 7B, 7C, 7D, or 7E as set forth in 40 CFR 60, Appendix A.

b) Tests to determine compliance with CO emission limits shall be conducted in accordance with Method 10, 10A, or 10B as set forth in 40 CFR 60, Appendix A.

c) Tests to determine compliance with VOC emission limits shall be conducted in accordance with Method 25, or 25A as set forth in 40 CFR 60, Appendix A.

9.3.4. With regard to the emissions testing required by the WV Division of Environmental Protection, Division of Air Quality (DAQ), the permittee shall submit to the Director of the DAQ a test protocol detailing the proposed test methods, date, and time testing is to take place, testing locations, and any other relevant information. The test protocol must be received by the Director no less than thirty (30) days prior to the date the testing is to take place. The Director shall be notified at least fifteen (15) days in advance of the actual dates and times during which the tests will be conducted. The results of emissions testing shall be submitted to the DAQ within thirty (30) days of completion of testing.

## 9.4 Recordkeeping Requirements

9.4.1. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit and time of sampling or measurements;

b. The date(s) analyses were performed;

c. The company or entity that performed the analyses;

d. The analytical techniques or methods used;

e. The results of the analyses; and

f. The operating conditions existing at the time of sampling or measurement.

9.4.2. **Record of Maintenance of Air Pollution Control Equipment.** For all pollution control equipment listed in Section 1.0, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

9.4.3. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

a. The equipment involved.
b. Steps taken to minimize emissions during the event.
c. The duration of the event.
d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

e. The cause of the malfunction.
f. Steps taken to correct the malfunction.
g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

9.4.4. For the purposes of determining compliance with the operation hour limitation for the 600 horsepower Clark Model RA-6 engine set forth in Source Specific Requirements 4.1.4., the permittee shall maintain accurate records of the hours of operation of the engine. Said records shall be maintained on site for a period of five (5) years, and shall be made available to the Director of the Division of Air Quality or his/her duly authorized representative upon request and shall be certified by a responsible official upon the submittal. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. When appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

9.4.5. For the purposes of determining compliance with the maximum fuel usage limit set forth in Source Specific

Requirements 4.1.5. and 4.1.6., the permittee shall maintain accurate records of the hours of operation, brake horsepower and the amount of natural gas consumed by each of the two1,320 horsepower Ingersoll-Rand Model 48KVS engines and the 600 horsepower Clark Model RA-6 engine. Said records shall be maintained on site for a period of five (5) years. Said records shall be made available to the Director of the Division of Air Quality or his/her duly authorized representative upon request and shall be certified by a responsible official upon the submittal. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. When appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

9.4.6. For the purpose of determining compliance with the requirements set forth in Source Specific Requirements 4.2.1 and 4.1.8, the permittee shall record on a monthly basis all periods during which the pilot flame was lost, and operating times for the flare, pilot flame monitoring equipment, and the dehydrator.

9.4.7. The permittee shall maintain records of daily, monthly, and annual hours of operation for the 229 hp natural gas-powered reciprocating engine/emergency generator set described in Source Specific Requirements 4.1.12. Said records shall be maintained on site for a period of five (5) years. Certified copies of these records shall be made available to the Chief of the Office of Air Quality or his/her duly authorized representative upon request. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. When appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

## 9.5 Reporting Requirements

9.5.1. NA

# APPENDIX C

# ELECTRONIC SUBMITTAL

## Title V Operating Permit Renewal Application

**Hubball Compressor Station, Facility ID No. 043-00002**
**Branchland, West Virginia**

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue, SE
Charleston, West Virginia

April 2017

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

**Identification**

| | |
|---|---|
| User Identification: | Hubball - A05 - Oil/Water Mixture Tank |
| City: | Branchland |
| State: | West Virginia |
| Company: | Columbia Pipeline Group |
| Type of Tank: | Vertical Fixed Roof Tank |
| Description: | Hubball Compressor Station |

**Tank Dimensions**

| | |
|---|---|
| Shell Height (ft): | 10.00 |
| Diameter (ft): | 8.50 |
| Liquid Height (ft) : | 10.00 |
| Avg. Liquid Height (ft): | 6.00 |
| Volume (gallons): | 4,200.00 |
| Turnovers: | 12.00 |
| Net Throughput(gal/yr): | 50,400.00 |
| Is Tank Heated (y/n): | N |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | Gray/Light |
| Shell Condition | Good |
| Roof Color/Shade: | Gray/Light |
| 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**

**Hubball - A05 - Oil/Water Mixture Tank - Vertical Fixed Roof Tank**
**Branchland, 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 | 61.57 | 52.97 | 70.18 | 57.22 | 0.0069 | 0.0051 | 0.0091 | 130.0000 | | | 188.00 | Option 1: VP60 = .0065 VP70 = .009 |

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

**Hubball - A05 - Oil/Water Mixture Tank - Vertical Fixed Roof Tank**
**Branchland, West Virginia**

| Annual Emission Calcaulations | |
|---|---|
| Standing Losses (lb): | 0.9274 |
| Vapor Space Volume (cu ft): | 255.8762 |
| Vapor Density (lb/cu ft): | 0.0002 |
| Vapor Space Expansion Factor: | 0.0621 |
| Vented Vapor Saturation Factor: | 0.9984 |
| | |
| Tank Vapor Space Volume: | |
| Vapor Space Volume (cu ft): | 255.8762 |
| Tank Diameter (ft): | 8.5000 |
| Vapor Space Outage (ft): | 4.5092 |
| Tank Shell Height (ft): | 10.0000 |
| Average Liquid Height (ft): | 6.0000 |
| 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): | 0.0002 |
| Vapor Molecular Weight (lb/lb-mole): | 130.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0069 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 521.2427 |
| 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): | 516.8933 |
| Tank Paint Solar Absorptance (Shell): | 0.5400 |
| Tank Paint Solar Absorptance (Roof): | 0.5400 |
| Daily Total Solar Insulation Factor (Btu/sqft day): | 1,250.5726 |
| | |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0.0621 |
| Daily Vapor Temperature Range (deg. R): | 34.4127 |
| Daily Vapor Pressure Range (psia): | 0.0040 |
| Breather Vent Press. Setting Range(psia): | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0069 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia): | 0.0051 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): | 0.0091 |
| Daily Avg. Liquid Surface Temp. (deg R): | 521.2427 |
| Daily Min. Liquid Surface Temp. (deg R): | 512.6395 |
| Daily Max. Liquid Surface Temp. (deg R): | 529.8458 |
| Daily Ambient Temp. Range (deg. R): | 21.5333 |
| | |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor: | 0.9984 |
| Vapor Pressure at Daily Average Liquid: | |
| Surface Temperature (psia): | 0.0069 |
| Vapor Space Outage (ft): | 4.5092 |
| | |
| Working Losses (lb): | 1.0753 |
| Vapor Molecular Weight (lb/lb-mole): | 130.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0069 |
| Annual Net Throughput (gal/yr.): | 50,400.0000 |
| Annual Turnovers: | 12.0000 |
| Turnover Factor: | 1.0000 |
| Maximum Liquid Volume (gal): | 4,200.0000 |
| Maximum Liquid Height (ft): | 10.0000 |
| Tank Diameter (ft): | 8.5000 |
| Working Loss Product Factor: | 1.0000 |
| | |
| Total Losses (lb): | 2.0028 |

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

**Emissions Report for: Annual**

**Hubball - A05 - Oil/Water Mixture Tank - Vertical Fixed Roof Tank**
**Branchland, West Virginia**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Distillate fuel oil no. 2 | 1.08 | 0.93 | 2.00 |

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

**Identification**

| | |
|---|---|
| User Identification: | Hubball - A06 - Used Oil Tank |
| City: | Branchland |
| State: | West Virginia |
| Company: | Columbia Pipeline Group |
| Type of Tank: | Horizontal Tank |
| Description: | Hubball 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): | 12,000.00 |
| Is Tank Heated (y/n): | N |
| Is Tank Underground (y/n): | N |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | Gray/Light |
| 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**

**Hubball - A06 - Used Oil Tank - Horizontal Tank**
**Branchland, 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 | 61.57 | 52.97 | 70.18 | 57.22 | 0.0069 | 0.0051 | 0.0091 | 130.0000 | | | 188.00 | Option 1: VP60 = .0065 VP70 = .009 |

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

**Hubball - A06 - Used Oil Tank - Horizontal Tank**
**Branchland, West Virginia**

| Annual Emission Calcaulations | |
|---|---|
| Standing Losses (lb): | 0.3278 |
| Vapor Space Volume (cu ft): | 90.3583 |
| Vapor Density (lb/cu ft): | 0.0002 |
| Vapor Space Expansion Factor: | 0.0621 |
| Vented Vapor Saturation Factor: | 0.9992 |
| 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): | 0.0069 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 521.2427 |
| 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): | 516.8933 |
| Tank Paint Solar Absorptance (Shell): | 0.5400 |
| Daily Total Solar Insulation Factor (Btu/sqft day): | 1,250.5726 |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0.0621 |
| Daily Vapor Temperature Range (deg. R): | 34.4127 |
| Daily Vapor Pressure Range (psia): | 0.0040 |
| Breather Vent Press. Setting Range(psia): | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0069 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia): | 0.0051 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): | 0.0091 |
| Daily Avg. Liquid Surface Temp. (deg R): | 521.2427 |
| Daily Min. Liquid Surface Temp. (deg R): | 512.6395 |
| Daily Max. Liquid Surface Temp. (deg R): | 529.8458 |
| 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): | 0.0069 |
| Vapor Space Outage (ft): | 2.1250 |
| Working Losses (lb): | 0.2560 |
| Vapor Molecular Weight (lb/lb-mole): | 130.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0069 |
| Annual Net Throughput (gal/yr.): | 12,000.0000 |
| Annual Turnovers: | 0.0000 |
| Turnover Factor: | 1.0000 |
| Tank Diameter (ft): | 4.2500 |
| Working Loss Product Factor: | 1.0000 |
| Total Losses (lb): | 0.5838 |

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

**Emissions Report for: Annual**

**Hubball - A06 - Used Oil Tank - Horizontal Tank**
**Branchland, West Virginia**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Distillate fuel oil no. 2 | 0.26 | 0.33 | 0.58 |

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

**Identification**

| | |
|---|---|
| User Identification: | Hubball - A07 - A08 - Glycol Tank |
| City: | Branchland |
| State: | West Virginia |
| Company: | Columbia Pipeline Group |
| Type of Tank: | Horizontal Tank |
| Description: | Hubball 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): | 12,000.00 |
| Is Tank Heated (y/n): | N |
| Is Tank Underground (y/n): | N |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | Gray/Light |
| 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**

**Hubball - A07 - A08 - Glycol Tank - Horizontal Tank**
**Branchland, 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 | 61.57 | 52.97 | 70.18 | 57.22 | 0.0010 | 0.0006 | 0.0016 | 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)

**Hubball - A07 - A08 - Glycol Tank - Horizontal Tank**
**Branchland, West Virginia**

| Annual Emission Calcaulations | |
|---|---|
| Standing Losses (lb): | 0.0285 |
| Vapor Space Volume (cu ft): | 90.3583 |
| Vapor Density (lb/cu ft): | 0.0000 |
| Vapor Space Expansion Factor: | 0.0619 |
| Vented Vapor Saturation Factor: | 0.9999 |
| | |
| 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): | 0.0000 |
| Vapor Molecular Weight (lb/lb-mole): | 76.1100 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0010 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 521.2427 |
| 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): | 516.8933 |
| Tank Paint Solar Absorptance (Shell): | 0.5400 |
| Daily Total Solar Insulation Factor (Btu/sqft day): | 1,250.5726 |
| | |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0.0619 |
| Daily Vapor Temperature Range (deg. R): | 34.4127 |
| Daily Vapor Pressure Range (psia): | 0.0010 |
| Breather Vent Press. Setting Range(psia): | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0010 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia): | 0.0006 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): | 0.0016 |
| Daily Avg. Liquid Surface Temp. (deg R): | 521.2427 |
| Daily Min. Liquid Surface Temp. (deg R): | 512.6395 |
| Daily Max. Liquid Surface Temp. (deg R): | 529.8458 |
| 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): | 0.0010 |
| Vapor Space Outage (ft): | 2.1250 |
| | |
| Working Losses (lb): | 0.0223 |
| Vapor Molecular Weight (lb/lb-mole): | 76.1100 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0010 |
| Annual Net Throughput (gal/yr.): | 12,000.0000 |
| Annual Turnovers: | 0.0000 |
| Turnover Factor: | 1.0000 |
| Tank Diameter (ft): | 4.2500 |
| Working Loss Product Factor: | 1.0000 |
| | |
| Total Losses (lb): | 0.0509 |

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

**Emissions Report for: Annual**

**Hubball - A07 - A08 - Glycol Tank - Horizontal Tank**
**Branchland, West Virginia**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Propylene glycol | 0.02 | 0.03 | 0.05 |

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

**Identification**

| | |
|---|---|
| User Identification: | Hubball - A09 - Scrubber Oil Tank |
| City: | Branchland |
| State: | West Virginia |
| Company: | Columbia Pipeline Group |
| Type of Tank: | Horizontal Tank |
| Description: | Hubball Compressor Station |

**Tank Dimensions**

| | |
|---|---|
| Shell Length (ft): | 8.00 |
| Diameter (ft): | 3.50 |
| Volume (gallons): | 550.00 |
| Turnovers: | 0.00 |
| Net Throughput(gal/yr): | 6,600.00 |
| Is Tank Heated (y/n): | N |
| Is Tank Underground (y/n): | N |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | Gray/Light |
| 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**

**Hubball - A09 - Scrubber Oil Tank - Horizontal Tank**
**Branchland, 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 | 61.57 | 52.97 | 70.18 | 57.22 | 0.0069 | 0.0051 | 0.0091 | 130.0000 | | | 188.00 | Option 1: VP60 = .0065 VP70 = .009 |

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

**Hubball - A09 - Scrubber Oil Tank - Horizontal Tank**
**Branchland, West Virginia**

| Annual Emission Calcaulations | |
|---|---|
| Standing Losses (lb): | 0.1779 |
| Vapor Space Volume (cu ft): | 49.0249 |
| Vapor Density (lb/cu ft): | 0.0002 |
| Vapor Space Expansion Factor: | 0.0621 |
| Vented Vapor Saturation Factor: | 0.9994 |
| Tank Vapor Space Volume: | |
| Vapor Space Volume (cu ft): | 49.0249 |
| Tank Diameter (ft): | 3.5000 |
| Effective Diameter (ft): | 5.9723 |
| Vapor Space Outage (ft): | 1.7500 |
| Tank Shell Length (ft): | 8.0000 |
| 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): | 0.0069 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 521.2427 |
| 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): | 516.8933 |
| Tank Paint Solar Absorptance (Shell): | 0.5400 |
| Daily Total Solar Insulation Factor (Btu/sqft day): | 1,250.5726 |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0.0621 |
| Daily Vapor Temperature Range (deg. R): | 34.4127 |
| Daily Vapor Pressure Range (psia): | 0.0040 |
| Breather Vent Press. Setting Range(psia): | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0069 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia): | 0.0051 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): | 0.0091 |
| Daily Avg. Liquid Surface Temp. (deg R): | 521.2427 |
| Daily Min. Liquid Surface Temp. (deg R): | 512.6395 |
| Daily Max. Liquid Surface Temp. (deg R): | 529.8458 |
| Daily Ambient Temp. Range (deg. R): | 21.5333 |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor: | 0.9994 |
| Vapor Pressure at Daily Average Liquid: Surface Temperature (psia): | 0.0069 |
| Vapor Space Outage (ft): | 1.7500 |
| Working Losses (lb): | 0.1408 |
| Vapor Molecular Weight (lb/lb-mole): | 130.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0069 |
| Annual Net Throughput (gal/yr.): | 6,600.0000 |
| Annual Turnovers: | 0.0000 |
| Turnover Factor: | 1.0000 |
| Tank Diameter (ft): | 3.5000 |
| Working Loss Product Factor: | 1.0000 |
| Total Losses (lb): | 0.3187 |

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

**Emissions Report for: Annual**

**Hubball - A09 - Scrubber Oil Tank - Horizontal Tank**
**Branchland, West Virginia**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Distillate fuel oil no. 2 | 0.14 | 0.18 | 0.32 |

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

**Identification**

| | |
|---|---|
| User Identification: | Hubball - A10 - Pipeline Liquids Tank |
| City: | Branchland |
| State: | West Virginia |
| Company: | Columbia Pipeline Group |
| Type of Tank: | Vertical Fixed Roof Tank |
| Description: | Hubball Compressor Station |

**Tank Dimensions**

| | |
|---|---|
| Shell Height (ft): | 5.50 |
| Diameter (ft): | 8.00 |
| Liquid Height (ft) : | 5.50 |
| Avg. Liquid Height (ft): | 3.00 |
| Volume (gallons): | 2,000.00 |
| Turnovers: | 12.00 |
| Net Throughput(gal/yr): | 24,000.00 |
| Is Tank Heated (y/n): | N |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | Gray/Light |
| Shell Condition | Good |
| Roof Color/Shade: | Gray/Light |
| Roof Condition: | Good |

**Roof Characteristics**

| | |
|---|---|
| Type: | Dome |
| Height (ft) | 1.00 |
| Radius (ft) (Dome Roof) | 8.00 |

**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**

**Hubball - A10 - Pipeline Liquids Tank - Vertical Fixed Roof Tank**
**Branchland, West Virginia**

| | | Daily Liquid Surf. Temperature (deg F) | | | Liquid Bulk Temp | Vapor Pressure (psia) | | | Vapor Mol. | Liquid Mass | Vapor Mass | Mol. | Basis for Vapor Pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mixture/Component | Month | Avg. | Min. | Max. | (deg F) | Avg. | Min. | Max. | Weight. | Fract. | Fract. | Weight | Calculations |
| Gasoline (RVP 10) | All | 61.57 | 52.97 | 70.18 | 57.22 | 5.3458 | 4.5163 | 6.2932 | 66.0000 | | | 92.00 | Option 4: RVP=10, ASTM Slope=3 |

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

**Hubball - A10 - Pipeline Liquids Tank - Vertical Fixed Roof Tank**
**Branchland, West Virginia**

| Annual Emission Calcaulations | |
|---|---|
| Standing Losses (lb): | 486.5201 |
| Vapor Space Volume (cu ft): | 151.3200 |
| Vapor Density (lb/cu ft): | 0.0631 |
| Vapor Space Expansion Factor: | 0.2588 |
| Vented Vapor Saturation Factor: | 0.5397 |
| | |
| Tank Vapor Space Volume: | |
| Vapor Space Volume (cu ft): | 151.3200 |
| Tank Diameter (ft): | 8.0000 |
| Vapor Space Outage (ft): | 3.0104 |
| Tank Shell Height (ft): | 5.5000 |
| Average Liquid Height (ft): | 3.0000 |
| Roof Outage (ft): | 0.5104 |
| | |
| Roof Outage (Dome Roof) | |
| Roof Outage (ft): | 0.5104 |
| Dome Radius (ft): | 8.0000 |
| Shell Radius (ft): | 4.0000 |
| | |
| Vapor Density | |
| Vapor Density (lb/cu ft): | 0.0631 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 5.3458 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 521.2427 |
| 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): | 516.8933 |
| Tank Paint Solar Absorptance (Shell): | 0.5400 |
| Tank Paint Solar Absorptance (Roof): | 0.5400 |
| Daily Total Solar Insulation Factor (Btu/sqft day): | 1,250.5726 |
| | |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0.2588 |
| Daily Vapor Temperature Range (deg. R): | 34.4127 |
| Daily Vapor Pressure Range (psia): | 1.7768 |
| Breather Vent Press. Setting Range(psia): | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 5.3458 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia): | 4.5163 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): | 6.2932 |
| Daily Avg. Liquid Surface Temp. (deg R): | 521.2427 |
| Daily Min. Liquid Surface Temp. (deg R): | 512.6395 |
| Daily Max. Liquid Surface Temp. (deg R): | 529.8458 |
| Daily Ambient Temp. Range (deg. R): | 21.5333 |
| | |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor: | 0.5397 |
| Vapor Pressure at Daily Average Liquid: Surface Temperature (psia): | 5.3458 |
| Vapor Space Outage (ft): | 3.0104 |
| | |
| Working Losses (lb): | 201.6143 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 5.3458 |
| Annual Net Throughput (gal/yr.): | 24,000.0000 |
| Annual Turnovers: | 12.0000 |
| Turnover Factor: | 1.0000 |
| Maximum Liquid Volume (gal): | 2,000.0000 |
| Maximum Liquid Height (ft): | 5.5000 |
| Tank Diameter (ft): | 8.0000 |
| Working Loss Product Factor: | 1.0000 |
| | |
| Total Losses (lb): | 688.1345 |

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

**Emissions Report for: Annual**

**Hubball - A10 - Pipeline Liquids Tank - Vertical Fixed Roof Tank**
**Branchland, West Virginia**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Gasoline (RVP 10) | 201.61 | 486.52 | 688.13 |

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

**Identification**

| | |
|---|---|
| User Identification: | Hubball - A11 - Pipeline Liquids Tank |
| City: | Branchland |
| State: | West Virginia |
| Company: | Columbia Pipeline Group |
| Type of Tank: | Horizontal Tank |
| Description: | Hubball Compressor Station |

**Tank Dimensions**

| | |
|---|---|
| Shell Length (ft): | 24.00 |
| Diameter (ft): | 6.00 |
| Volume (gallons): | 5,000.00 |
| Turnovers: | 0.00 |
| Net Throughput(gal/yr): | 60,000.00 |
| Is Tank Heated (y/n): | N |
| Is Tank Underground (y/n): | N |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | Gray/Light |
| 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**

**Hubball - A11 - Pipeline Liquids Tank - Horizontal Tank**
**Branchland, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline (RVP 10) | All | 61.57 | 52.97 | 70.18 | 57.22 | 5.3458 | 4.5163 | 6.2932 | 66.0000 | | | 92.00 | Option 4: RVP=10, ASTM Slope=3 |

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

**Hubball - A11 - Pipeline Liquids Tank - Horizontal Tank**
**Branchland, West Virginia**

| Annual Emission Calcaulations | |
|---|---|
| Standing Losses (lb): | 1,391.8763 |
| Vapor Space Volume (cu ft): | 432.2191 |
| Vapor Density (lb/cu ft): | 0.0631 |
| Vapor Space Expansion Factor: | 0.2588 |
| Vented Vapor Saturation Factor: | 0.5405 |
| Tank Vapor Space Volume: | |
| Vapor Space Volume (cu ft): | 432.2191 |
| Tank Diameter (ft): | 6.0000 |
| Effective Diameter (ft): | 13.5440 |
| Vapor Space Outage (ft): | 3.0000 |
| Tank Shell Length (ft): | 24.0000 |
| Vapor Density | |
| Vapor Density (lb/cu ft): | 0.0631 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 5.3458 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 521.2427 |
| 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): | 516.8933 |
| Tank Paint Solar Absorptance (Shell): | 0.5400 |
| Daily Total Solar Insulation Factor (Btu/sqft day): | 1,250.5726 |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0.2588 |
| Daily Vapor Temperature Range (deg. R): | 34.4127 |
| Daily Vapor Pressure Range (psia): | 1.7768 |
| Breather Vent Press. Setting Range(psia): | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 5.3458 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia): | 4.5163 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): | 6.2932 |
| Daily Avg. Liquid Surface Temp. (deg R): | 521.2427 |
| Daily Min. Liquid Surface Temp. (deg R): | 512.6395 |
| Daily Max. Liquid Surface Temp. (deg R): | 529.8458 |
| Daily Ambient Temp. Range (deg. R): | 21.5333 |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor: | 0.5405 |
| Vapor Pressure at Daily Average Liquid: Surface Temperature (psia): | 5.3458 |
| Vapor Space Outage (ft): | 3.0000 |
| Working Losses (lb): | 504.0358 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 5.3458 |
| Annual Net Throughput (gal/yr.): | 60,000.0000 |
| Annual Turnovers: | 0.0000 |
| Turnover Factor: | 1.0000 |
| Tank Diameter (ft): | 6.0000 |
| Working Loss Product Factor: | 1.0000 |
| Total Losses (lb): | 1,895.9121 |

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

**Emissions Report for: Annual**

**Hubball - A11 - Pipeline Liquids Tank - Horizontal Tank**
**Branchland, West Virginia**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Gasoline (RVP 10) | 504.04 | 1,391.88 | 1,895.91 |

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

**Identification**

| | |
|---|---|
| User Identification: | Hubball - A13 - Pipeline Liquids Tank |
| City: | Branchland |
| State: | West Virginia |
| Company: | Columbia Pipeline Group |
| Type of Tank: | Vertical Fixed Roof Tank |
| Description: | Hubball Compressor Station |

**Tank Dimensions**

| | |
|---|---|
| Shell Height (ft): | 14.50 |
| Diameter (ft): | 12.00 |
| Liquid Height (ft) : | 14.50 |
| Avg. Liquid Height (ft): | 7.00 |
| Volume (gallons): | 12,000.00 |
| Turnovers: | 12.00 |
| Net Throughput(gal/yr): | 144,000.00 |
| Is Tank Heated (y/n): | N |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | Gray/Light |
| Shell Condition | Good |
| Roof Color/Shade: | Gray/Light |
| Roof Condition: | Good |

**Roof Characteristics**

| | |
|---|---|
| Type: | Dome |
| Height (ft) | 1.00 |
| Radius (ft) (Dome Roof) | 12.00 |

**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**

**Hubball - A13 - Pipeline Liquids Tank - Vertical Fixed Roof Tank**
**Branchland, West Virginia**

| | | Daily Liquid Surf. Temperature (deg F) | | | Liquid Bulk Temp | Vapor Pressure (psia) | | | Vapor Mol. | Liquid Mass | Vapor Mass | Mol. | Basis for Vapor Pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mixture/Component | Month | Avg. | Min. | Max. | (deg F) | Avg. | Min. | Max. | Weight. | Fract. | Fract. | Weight | Calculations |
| Gasoline (RVP 10) | All | 61.57 | 52.97 | 70.18 | 57.22 | 5.3458 | 4.5163 | 6.2932 | 66.0000 | | | 92.00 | Option 4: RVP=10, ASTM Slope=3 |

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

**Hubball - A13 - Pipeline Liquids Tank - Vertical Fixed Roof Tank**
**Branchland, West Virginia**

| Annual Emission Calcaulations | |
|---|---|
| Standing Losses (lb): | 1,650.3813 |
| Vapor Space Volume (cu ft): | 905.3023 |
| Vapor Density (lb/cu ft): | 0.0631 |
| Vapor Space Expansion Factor: | 0.2588 |
| Vented Vapor Saturation Factor: | 0.3060 |
| | |
| Tank Vapor Space Volume: | |
| Vapor Space Volume (cu ft): | 905.3023 |
| Tank Diameter (ft): | 12.0000 |
| Vapor Space Outage (ft): | 8.0046 |
| Tank Shell Height (ft): | 14.5000 |
| Average Liquid Height (ft): | 7.0000 |
| Roof Outage (ft): | 0.5046 |
| | |
| Roof Outage (Dome Roof) | |
| Roof Outage (ft): | 0.5046 |
| Dome Radius (ft): | 12.0000 |
| Shell Radius (ft): | 6.0000 |
| | |
| Vapor Density | |
| Vapor Density (lb/cu ft): | 0.0631 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 5.3458 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 521.2427 |
| 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): | 516.8933 |
| Tank Paint Solar Absorptance (Shell): | 0.5400 |
| Tank Paint Solar Absorptance (Roof): | 0.5400 |
| Daily Total Solar Insulation Factor (Btu/sqft day): | 1,250.5726 |
| | |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0.2588 |
| Daily Vapor Temperature Range (deg. R): | 34.4127 |
| Daily Vapor Pressure Range (psia): | 1.7768 |
| Breather Vent Press. Setting Range(psia): | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 5.3458 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia): | 4.5163 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): | 6.2932 |
| Daily Avg. Liquid Surface Temp. (deg R): | 521.2427 |
| Daily Min. Liquid Surface Temp. (deg R): | 512.6395 |
| Daily Max. Liquid Surface Temp. (deg R): | 529.8458 |
| Daily Ambient Temp. Range (deg. R): | 21.5333 |
| | |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor: | 0.3060 |
| Vapor Pressure at Daily Average Liquid: Surface Temperature (psia): | 5.3458 |
| Vapor Space Outage (ft): | 8.0046 |
| | |
| Working Losses (lb): | 1,209.6860 |
| Vapor Molecular Weight (lb/lb-mole): | 66.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 5.3458 |
| Annual Net Throughput (gal/yr.): | 144,000.0000 |
| Annual Turnovers: | 12.0000 |
| Turnover Factor: | 1.0000 |
| Maximum Liquid Volume (gal): | 12,000.0000 |
| Maximum Liquid Height (ft): | 14.5000 |
| Tank Diameter (ft): | 12.0000 |
| Working Loss Product Factor: | 1.0000 |
| | |
| Total Losses (lb): | 2,860.0673 |

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

**Emissions Report for: Annual**

**Hubball - A13 - Pipeline Liquids Tank - Vertical Fixed Roof Tank**
**Branchland, West Virginia**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Gasoline (RVP 10) | 1,209.69 | 1,650.38 | 2,860.07 |

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

**Identification**

| | |
|---|---|
| User Identification: | Hubball - A14 - Used Oil Tank |
| City: | Branchland |
| State: | West Virginia |
| Company: | Columbia Pipeline Group |
| Type of Tank: | Horizontal Tank |
| Description: | Hubball Compressor Station |

**Tank Dimensions**

| | |
|---|---|
| Shell Length (ft): | 5.00 |
| Diameter (ft): | 3.00 |
| Volume (gallons): | 125.00 |
| Turnovers: | 0.00 |
| Net Throughput(gal/yr): | 1,500.00 |
| Is Tank Heated (y/n): | N |
| Is Tank Underground (y/n): | N |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | Gray/Light |
| 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**

**Hubball - A14 - Used Oil Tank - Horizontal Tank**
**Branchland, 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 | 61.57 | 52.97 | 70.18 | 57.22 | 0.0069 | 0.0051 | 0.0091 | 130.0000 | | | 188.00 | Option 1: VP60 = .0065 VP70 = .009 |

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

**Hubball - A14 - Used Oil Tank - Horizontal Tank**
**Branchland, West Virginia**

| Annual Emission Calcaulations | |
|---|---|
| Standing Losses (lb): | 0.0817 |
| Vapor Space Volume (cu ft): | 22.5114 |
| Vapor Density (lb/cu ft): | 0.0002 |
| Vapor Space Expansion Factor: | 0.0621 |
| Vented Vapor Saturation Factor: | 0.9995 |
| | |
| Tank Vapor Space Volume: | |
| Vapor Space Volume (cu ft): | 22.5114 |
| Tank Diameter (ft): | 3.0000 |
| Effective Diameter (ft): | 4.3713 |
| Vapor Space Outage (ft): | 1.5000 |
| Tank Shell Length (ft): | 5.0000 |
| | |
| 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): | 0.0069 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 521.2427 |
| 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): | 516.8933 |
| Tank Paint Solar Absorptance (Shell): | 0.5400 |
| Daily Total Solar Insulation Factor (Btu/sqft day): | 1,250.5726 |
| | |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0.0621 |
| Daily Vapor Temperature Range (deg. R): | 34.4127 |
| Daily Vapor Pressure Range (psia): | 0.0040 |
| Breather Vent Press. Setting Range(psia): | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0069 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia): | 0.0051 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia): | 0.0091 |
| Daily Avg. Liquid Surface Temp. (deg R): | 521.2427 |
| Daily Min. Liquid Surface Temp. (deg R): | 512.6395 |
| Daily Max. Liquid Surface Temp. (deg R): | 529.8458 |
| Daily Ambient Temp. Range (deg. R): | 21.5333 |
| | |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor: | 0.9995 |
| Vapor Pressure at Daily Average Liquid: Surface Temperature (psia): | 0.0069 |
| Vapor Space Outage (ft): | 1.5000 |
| | |
| Working Losses (lb): | 0.0320 |
| Vapor Molecular Weight (lb/lb-mole): | 130.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0069 |
| Annual Net Throughput (gal/yr.): | 1,500.0000 |
| Annual Turnovers: | 0.0000 |
| Turnover Factor: | 1.0000 |
| Tank Diameter (ft): | 3.0000 |
| Working Loss Product Factor: | 1.0000 |
| | |
| Total Losses (lb): | 0.1137 |

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

**Emissions Report for: Annual**

**Hubball - A14 - Used Oil Tank - Horizontal Tank**
**Branchland, West Virginia**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Distillate fuel oil no. 2 | 0.03 | 0.08 | 0.11 |

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

**Identification**

| | |
|---|---|
| User Identification: | Hubball - B01 - Lube Oil Tank |
| City: | Branchland |
| State: | West Virginia |
| Company: | Columbia Pipeline Group |
| Type of Tank: | Horizontal Tank |
| Description: | Hubball Compressor Station |

**Tank Dimensions**

| | |
|---|---|
| Shell Length (ft): | 24.00 |
| Diameter (ft): | 6.00 |
| Volume (gallons): | 5,058.00 |
| Turnovers: | 0.00 |
| Net Throughput(gal/yr): | 60,696.00 |
| Is Tank Heated (y/n): | N |
| Is Tank Underground (y/n): | Y |

**Paint Characteristics**

| | |
|---|---|
| Shell Color/Shade: | |
| Shell Condition | |

**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**

**Hubball - B01 - Lube Oil Tank - Horizontal Tank**
**Branchland, 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 | 54.42 | 54.42 | 54.42 | 53.98 | 0.0054 | 0.0054 | 0.0054 | 130.0000 | | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 |

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

**Hubball - B01 - Lube Oil Tank - Horizontal Tank**
**Branchland, West Virginia**

| Annual Emission Calcaulations | |
|---|---|
| No Standing Losses: Underground Tank | |
| Working Losses (lb): | 1.0116 |
| Vapor Molecular Weight (lb/lb-mole): | 130.0000 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia): | 0.0054 |
| Annual Net Throughput (gal/yr.): | 60,696.0000 |
| Annual Turnovers: | 0.0000 |
| Turnover Factor: | 1.0000 |
| Tank Diameter (ft): | 6.0000 |
| Working Loss Product Factor: | 1.0000 |
| Total Losses (lb): | 1.0116 |

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

**Emissions Report for: Annual**

**Hubball - B01 - Lube Oil Tank - Horizontal Tank**
**Branchland, West Virginia**

| | Losses(lbs) | | |
|---|---|---|---|
| Components | Working Loss | Breathing Loss | Total Emissions |
| Distillate fuel oil no. 2 | 1.01 | 0.00 | 1.01 |